ABSTRACT

Steven B. Asby, EARLY ALERT AND INTERVENTION SYSTEMS AND STUDENT PERSISTENCE: AN EXPLORATION OF STUDENT PERCEPTIONS (Under the direction of Dr. Cheryl McFadden). Department of Educational Leadership, April 2015.

Postsecondary institutions have increasingly attempted to discover innovative methods to promote student engagement and persistence, thus combating student attrition. In recent years, the higher education landscape has been flooded with intervention strategies sourced in early alert systems that utilize technological components to encourage student connections to institutional support entities. Whether homegrown or commercially developed, early alert systems provide cost-effective means of bolstering student persistence while depleting limited financial resources. While early alert systems have the potential to be a useful and cost-effective tactic to provide students with platforms for connections to faculty, academic advisors, and support resources, their development and implementation provides challenges.

This study was based on Tinto's student development and Astin's student engagement theories. The purpose of this study was to uncover and analyze student perceptions of early alert system usage as a retention tool, an area of research lacking depth. The entire undergraduate student enrollment ($N = 21,437$) during the fall 2014 academic semester at East Carolina University was invited to complete an on-line survey requesting student opinions of campus utilization of the Starfish™ early alert system. A total of 4,658 student responses were collected.

A series of statistical tests were used to assess differences in student perceptions of early alert system usage. General student opinions of early alert system structure and differences within student population groups and demographics were also discovered through data examination. Additionally, results of the analysis showed statistical significance indicating that early alert systems serve as conduits between students and the institution, impacting their

educational satisfaction, motivation to seek resources, communication with campus officials, and overall sense of belonging.

Results from this study offer implications and recommendations for administrators, faculty, and other key institutional decision-makers focused on utilizing early alert systems as a retention tool. Study findings contribute to the body of knowledge on student development, engagement, and persistence, yet additional research is necessary to further investigate the impact of early alert systems in higher education.

EARLY ALERT AND INTERVENTION SYSTEMS AND STUDENT PERSISTENCE:

AN EXPLORATION OF STUDENT PERCEPTIONS

A Dissertation

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by

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AN EXPLORATION OF STUDENT PERCEPTIONS

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DEDICATION

When I'm in the sweet daughter's eyes, my heart is now ruined for the rest of all time.

There's no part of it left to give. I never lived 'til I lived in your light,

And my heart never beat like it does at the sight, of you baby blue, God blessed your life...

I do not live 'less I live in your light.

A Fathers First Spring-The Avett Brothers

To EB and Lisey, may this provide the foundation for a blueprint to shape your and our family's legacy. Daddy's sacrifice was for you...even before you were you. May God use it to empower and inspire your life work. Most importantly, let this serve as an infinite testament to the love I have for you both. I love you to the moon and back.

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To my fellow cohort members, it is our job to make it all count.

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CHAPTER 1: INTRODUCTION

A popular topic of conversation across the higher education landscape revolves around the retention of students from their first year to their second. Research indicates that the majority of students who drop out of college do so during the first academic year (Upcraft, Gardner, & Barefoot, 2005). It is estimated that nearly half the students who begin college will never complete a degree (DeBerard, Speilmans, & Julka, 2004; Swail, 2004; Tinto, 1993). This staggering percentage supports the need for institutions to pay more attention to student success in the first year, as retention to the second year is an important factor for predicted graduation (Tinto, 2006). Discovering tactics to address issues that surround student attrition and departure rates is quite difficult due to the diverse nature of individual institutions and student populations. Despite the difficulty in locating one universal approach to prevent students from withdrawing, institutions find themselves in a battle to retain the students they recruited in order to bolster their retention and graduation rates.

Campbell (2006) reports that awareness of the student dropout problem is contributing to the demand that higher education be more accountable. Universities are spending valuable time and resources to investigate, develop, and implement strategic processes and programming specifically structured to promote student retention and persistence (Supiano, 2009). Within the context of higher education, student and academic affairs professionals offer students opportunities to develop social and academic competencies, resulting in employable graduates. Such professionals find themselves constantly searching for appropriate strategies to provide students with opportunities that promote maturation and development in college (Pizzolato, Hicklen, Brown, & Chaudhari, 2009). Student and academic affairs administrators bear the

burden of developing, implementing, and assessing strategic activities provided to students in order to increase student success and engagement.

Raisman (2010) explains that the reality facing professionals in the current higher education environment is one of decreased funding in the face of heightened scrutiny from internal and external stakeholders. The current climate of higher education is mired in a multitude of problems; however, most are linked to student success (Holliday, 2012). Topping the list of concerns facing many college students are lack of preparedness and academic difficulty (Bowman, 2010). Issues of academic trouble prove particularly problematic for students from underserved populations, first-generation college attendees, and those with limited financial resources (Chemers, Hu, & Garcia, 2001; Conley & Hamlin, 2009; Rienks & Taylor, 2009). As retention, persistence, and graduation become more visible as parameters of academic progress and success, academic difficulty becomes increasingly important to address, particularly for the success and retention of both at-risk and high potential students.

Early intervention initiatives have gained a great deal of national attention in recent years as an effective strategy to increase student retention and engagement (Jaschik, 2008). Kuh (2006) stresses the importance of early student intervention. As a result of national momentum towards early intervention strategies, the recent introduction of commercial early warning systems has provided a great opportunity for campuses to secure the best option for their campus needs. Hobsons (2010) explains that due to the unique nature of institutions of higher education, early alert systems should be modified to meet specific institutional needs. Effective early alert systems should include integration of student support services, data collection and review, and institutional communication networks (Swail, 2004). The need for empirical evidence of the effectiveness and adequacy of early alert systems is paramount as institutions begin to utilize

such systems to support student success. Although Wasley (2007) affirms Kuh (2006) and Tinto's (2006) research that intrusive intervention strategies improve student success and retention, he claims that early warning systems are risky investments without offering legitimate statistical evidence of performance. In light of these findings, this study explores exactly how early alert systems can enhance efforts to promote student engagement in order to increase retention in higher education.

President Barack Obama explains that a post-secondary degree is no longer a pathway to opportunity for a talented few, but a prerequisite for a successful future (White House, 2012). Higher education in the United States has not always been focused on providing accessibility and affordability to students. Thelin (2004) points out that, in the past, post-secondary education was seen as being only for the affluent, providing sophisticated training and epistemological advancement to the wealthy. With expanding academic programs, growing student populations, and constant shifts in educational trajectories, institutions no longer share the same brick and mortar appearance once considered common (Goodchild & Wechsler, 1997).

Evolving from its earliest educational structure for the wealthy, higher education in the United States now attempts to empower students with a combination of knowledge and utility (Thelin, 2004). The American Association of State Colleges and Universities (2011) suggests that the two facets of knowledge and utility are at the heart of the debate between liberal arts proponents and those who prefer campuses to focus more on job readiness. Since schools vary in academic identities, priorities, and funding sources, it is difficult to make generalizations that fit all institutions; therefore, highlighting four-year, public colleges and universities that are members of consolidated school systems provides a better comparison scope for this study.

Today, colleges and universities are paying more attention than ever before to student recruitment, retention, and graduation (Jaschik, 2008). Since the early 1980s, research literature has investigated ways to improve student success in higher education through student outcomes, including retention, graduation, and employability (Zepke & Leach, 2010). The transition from American higher education's early roots to the current state of academic affairs offers insight into issues facing today's post-secondary institutions. Bishop (2004) suggests that many of these issues are related to the preservation of the sanctity of higher education; its commitment to innovation, research, and creativity; and the development of actualized graduates. Colleges and universities find themselves rethinking the way they package their product in response to scrutiny from students, parents, employers, politicians, media, and other concerned parties (Reason, Terenzini, & Domingo, 2006).

In a departure from its earliest forms, contemporary higher education can be viewed as a business when considering the massive amounts of marketing, management, and fiscal responsibilities necessary to keep institutions afloat (Lederman, 2009). In many business models, accountability and assessment are paramount in order to keep corporations efficient. As with businesses, an economic focus drives higher education to become more accountable, more efficient, and more productive in the use of publicly generated funds (Alexander, 2000; Carey, 2007). Lederman (2009) suggests that the notion that colleges and universities should act more like businesses has garnered support from some trustees and state leaders due to recent economic recession. As the national attention turns to institutions to demonstrate their value and to provide evidence that they are doing what they purport, campuses are attempting to find such proof.

Alexander (2000) touches on the reality that "governmental authorities are no longer as receptive to the traditional self-regulatory processes that have dominated university development

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for centuries" (p. 411) and cites dramatic changes in the way governing bodies interact with colleges and universities. This increased focus on accountability in the past decade has sparked national, state, and local educational leaders to act in order to provide better results. The National Commission on Accountability in Higher Education's (2005) report publicized the crisis surrounding American higher education's claim to being the finest in the world in terms of access, graduates, and research. The United States' long-standing stronghold on higher education is under attack as the gap between the American system and those of other countries has closed considerably (Carey, 2007). As international education institutions improve, American institutions face the reality that they may have to adapt many traditional practices to survive in the global education marketplace.

The national imperative of accountability in higher education has trickled down to the state level, leaving consolidated system administrators, governors, and politicians looking towards their constituent campuses to provide evidence of goal achievement. Alexander (2000) suggests that the economic situation drives states to redefine systems by pressuring institutions to become more accountable, more efficient, and more productive in the use of public funds. Institutions face a responsibility to graduates, funding sources, and society at large, commonly defined as accountability (Carey, 2007). Finding common ground between accountability owed to various stakeholders while addressing commitments to academic freedom challenges campuses worldwide, as often the two philosophies are contradictory in nature.

Recent research findings from the Lumina Foundation and Georgetown University's Center on Education and the Workforce (Pope, 2012) provide evidence that a college education is a valuable commodity to those actively seeking employment in the United States. Pope points out that the unemployment rate for four-year college graduates is 4.5%, while the rates for

graduates holding only high school diplomas hover near 24%. Compared to job seekers without an undergraduate degree, college graduates fare better in the competitive job market by a considerable margin. The existing statistics explain the ever-increasing number of students who are pursuing post-secondary degrees.

The United States Department of Education (2008) reports that among all first-time, full-time college students starting an undergraduate degree at a four-year institution in 2000, only 36.1% completed their academic program within four years, 52.6% within five years, and 57.5% in six years. Educators with the intention of forming strategic measures to improve student retention and graduation rates have explored many variables regarding their influence on recruiting, enrolling, retaining, and graduating college students (Braxton, 2009). Research confirms that the level of student sense of belonging to their respective campuses is a valuable predictor for the prevention of student attrition, providing an explanation for the recent expansion of institutional attention to student engagement and involvement (Pascarella, Seifert, & Whitt, 2008; Pascarella, & Terenzini, 2005; Stevenson, Buchanan, & Sharpe, 2006; Tinto, 2000).

Tinto (2006) claims that today's institutions of higher education must be committed to taking student retention and graduation rates more seriously in order to improve student success and to be responsive to current public scrutiny. Kuh (2006) suggests that contact with a significant person within an institution of higher education is a crucial factor in a student's decision to remain in college. Factors related to a student's ability to transition and to be retained to their second year revolve around foundations established by Kuh (2006) and Tinto (2006). These foundations encompass academic and non-academic factors that support the idea that the more a student believes people within the institution care about her success, the more motivated

the student will be in seeking out resources, the more satisfied with education choices, and the more successful academically (Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008).

Accepting the foundational premise that students require personal interaction to navigate the college environment successfully necessitates that institutions develop and implement programming to increase student interaction with campus resources (Raisman, 2010). Holliday (2012) suggests that campuses form success networks to link students with appropriate support structures. Formation of a support network is important, but communication among institutional resources is paramount in order to provide proactive approaches to deal with student issues (Kuh, Cruce, Shoup, & Kinzie, 2008). Networks promoting and supporting communication between campus resources provide opportunities for seamless dissemination of information. The timely exchange of information related to student progress allows institutions to be more attentive to students requiring more support. This awareness and attentiveness to at-risk student populations may be the link campuses need to solve the retention and graduation dilemma facing institutions across the nation.

With levels of accountability increasing exponentially without signs of slowing, institutions must constantly evaluate their programming to justify their existence (Alexander, 2000; Carey, 2007; Huisman & Currie, 2004; Kirwan, 2006). Campus early warning systems incorporate multi-directional networking to provide students with opportunities for increased communication with faculty and academic support, further developing their ability to become advocates for themselves. Although evidence exists that early warning systems promote student development and increase retention rates, assessing their effectiveness and adequacy becomes paramount in the high-tension economic climate currently facing higher education.

Increased scrutiny of institutions to improve accountability measures has forced academic leaders to assess programs and initiatives constantly for efficiency (Alexander, 2000). When students believe that they are cared about, they are more apt to persist and move towards graduation. Raisman (2010) offered a recommendation to higher educational leaders to subscribe to the habit of evaluating student support services in order to ensure that they meet the needs of students. Processes created to indicate at-risk student populations and to provide accompanying support, commonly referred to as early warning or alert systems, have the potential to revolutionize the way students connect on college campuses and, depending on their success, could possibly be a valid retention option for institutions.

The Business-Higher Education Forum (BHEF) initiative on Public Accountability for Student Learning in Higher Education (2004), commissioned by the American Council on Education, stresses the role of technology in building campus networks and strengthening student support in higher education. As popularity of early warning systems grows, technological advances provide further reaching opportunities for campuses to intervene with struggling students. With many colleges and universities attempting to create student-centered learning environments, the use of technology is becoming an effective and efficient tool to shrink large enrollments and simulate smaller, more intimate environments on campuses (Coley & Coley, 2010). The use of course management systems, online communities, social media, and other electronic resources allows campuses to reduce large student populations into smaller, more digestible populations as a way to provide more individualized attention to students. Research indicates that relationships are the key to student success; therefore, nurturing those relationships with technology that strengthens student-university communication and interaction is paramount (Wasley, 2007).

State of North Carolina Perspective

Through powers provided within North Carolina General Statute 116, the Board of Governors of the University of North Carolina System is charged with the development, management, and governance of long-term plans for constituent institutions (UNC, 2013). The Board of Governors, in partnership with the president of the University of North Carolina System, put forth Our Time, Our Future: The UNC Compact with North Carolina (UNC Board of Governors, 2013), the strategic plan for the University of North Carolina System for the years 2013-2018. Within this strategic initiative is a declaration that each constituent campus will focus on fostering student success. In response to national attention towards accountability, the University of North Carolina System's policies on student success adopted by the Board of Governors direct constituent institutions to improve retention, graduation rates, and time to degree. The 2009 ACT National Collegiate Retention and Persistence to Degree Rates reports that only 43% of students enrolled at public institutions graduated within five years from their original institutions, as did approximately 56% of their peers enrolled at private institutions. Given the more selective nature of flagship institutions, higher graduation could be assumed; however, only 49% of undergraduate students completed college within four years, an additional 24% within five years, and another 4% within six years (Bowen, Chingos, & McPherson, 2009, p. 32). The leaders of the University of North Carolina System approached their newest policies in response to the reality facing higher education.

Institutional Perspective

Academic leaders at East Carolina University, a constituent University of North Carolina System institution, utilize the Strategic Planning Executive Committee to monitor implementation of system policies. This committee is charged with receiving policy changes and

effectively planning institutional responses to policy changes such as those included in the Our Time, Our Future: The UNC Compact with North Carolina (UNC Board of Governors, 2013) strategic plan. East Carolina University has been serving the residents of Eastern North Carolina for more than 100 years, annually enrolling just under 30,000 students. Providing support for student success is imperative in relation to recent University of North Carolina System policy manual updates. Campuses routinely assess program effectiveness and efficiency to ensure compliance with system policies and standards. To improve retention, academic progression, graduation, and time to degree rates at East Carolina University, adoption of an early alert system utilizing Starfish™ Retention Solutions has been implemented, allowing faculty members to give feedback to students beyond grades on assignments.

Efforts to support students to graduation have not proven to be completely successful. As policy makers continue to shift their focus from access, as important as that has been to the equitable delivery of education services, to completion, the failure of these efforts is under increasing scrutiny (Coley & Coley, 2010). Noting the positive outcomes of earning a college degree, including potential earnings, overall economic recovery, and development of human capital, retaining and graduating students is extremely important to all concerned with the future. Programs like the Obama administration's American Graduation Initiative and the College Access and Completion Innovation Fund provide opportunities, but also a new focus on retention, persistence, and graduation. As that focus sharpens and the demand for more accountability grows, student success will become a critical factor that will affect funding, reputations, and rankings.

The focus on student retention and graduation rates at times has impacted resources in higher education. In some cases, institutional and departmental funding is directly tied to

retention and graduation statistics (Zhang, 2009). In response to increased scrutiny and demands for accountability by stakeholders, institutions have developed and implemented strategies to recruit, retain, and graduate more students. In addition to faculty engagement with students, academic advising has emerged as one of the leading structured activities to provide students one-on-one interaction with a concerned campus official (Habley, 1994). Astin (1977, 1993), Noel, Levitz, and Saluri (1985), Tinto (1987), and Rendon (1995) all touch on the importance of personal contacts in the form of advising and classroom interaction to provide students with adequate support as they transition to college. Outside the classroom, academic advisors are typically referred to as a "go-to" resource by students, providing connections to various campus services. In regard to retention, academic advising has great value to the success of students and is a central part of collaborative student development on college campuses (Nutt, 2003).

Retaining first-year students is critical to improving graduation rates, since research shows that many students do not complete a degree (DeBerard, Speilmans, & Julka, 2004; Swail, 2004; Tinto, 1993). In response to the mandate for increased student success from the University of North Carolina System administrators, and considering performance-based funding to be tied to retention and graduation rates, East Carolina University implemented an early alert system utilizing Starfish™ Retention Solutions, providing faculty members a platform to inform students with timely course feedback.

Feedback from faculty is delivered to students through positive and negative notifications ranging from "Kudos," referencing positive or improving student performance, to warning "Flags", indicating academic difficulty of some sort. When instructors submit a notification, the student receives an email, which is also sent to the student's academic advisor. Providing faculty notifications to academic advisors has formed the foundation of the early intervention system

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currently used by this large institution to help solve the retention conundrum. Since the implantation of Starfish™ Retention Solutions, nearly 100,000 notifications have been sent by faculty regarding student performance over two academic years. Effectiveness of Starfish™ Retention Solutions as an early intervention strategy is dependent upon student, faculty, and advisor involvement. Determining whether the merits of the system produce an appropriate return on investment in the form of increased student success, higher retention and graduation rates, and improved student engagement is essential.

This study may provide foundational retention practices for other peer institutions that expand higher education's options for accountability by improving student retention and supplying society with more prepared college graduates. Even from a single campus evaluation at East Carolina University, assessment of Starfish™ Retention Solutions may prove to be a new strategic approach of connecting students to campus resources and establishing more effective retention models worldwide. Wasley (2007) suggests that early alert systems can be considered "secret support networks" (p. 1) that may be a premiere option as a retention solution in higher education. If found to be effective, structured early warning systems could be the standard blueprint for colleges and universities to use in order to answer the call for accountability.

Statement of the Problem

Retaining students is a large component of the national conversation within higher education. Demands and scrutiny for enhanced accountability from various stakeholders and policy makers have thrust performance-based funding models into academia with great force. Kirwan's (2006) proposition that higher education faces a tall task to earn the public's trust is a reality since post-secondary education sometimes appears to have more skeptics than advocates. Carey (2007) insists that the societal view of higher education revolves around the perception

that colleges and universities are not held to the same standards of performance and output as other tax and state-supported entities. In response to such critics, governing bodies have started examining the lack of accountability granted to higher education in the past. Garnering attention from multiple directions, accountability in higher education has become a topic of interest from small, liberal arts colleges to the White House (Thelin, 2010).

For many institutions and consolidated university systems, responses to the demands for greater accountability relate to student success and improved learning outcomes. Providing evidence that schools do what they purport to do has proved to be extremely difficult, however; higher education finds itself working diligently to produce direct rebuttals to accountability ultimatums (Alexander, 2000; Huisman & Currie, 2004). Identifying areas of concern to academic success may provide foundational information needed to develop and implement effective strategies for retaining and graduating students and may provide possible solutions for the larger higher education community. It is highly unlikely that retaining every enrolled student is possible. Institutions do, however, aim to retain as many students as possible. The goal of this study is to discover the legitimacy of early alert systems as a means to connect students to their campuses and to promote involvement and engagement in order to increase retention of first-year students.

Purpose of the Study

Solving the retention problem is a top priority for institutions. Aubuchon-Endsley and Callahan (2009) remarked that analyzing institutional data and assessment information is extremely important when developing and orchestrating action plans for retention-related issues. As a result of the commitment to serving the state of North Carolina and acknowledging the need for enhanced student retention accountability, the University of North Carolina System

implemented a proactive campaign to anticipate and identify future potential needs facing public

higher education in the state (UNC Tomorrow, 2012). Utilizing system enrollment data in

combination with the recent national awareness of issues facing students in higher education,

East Carolina University, a constituent campus of University of North Carolina System, has

focused on freshmen retention rates (J. Geissler, personal communication, November 30, 2012).

As highlighted in the Strategic Plan, ECU Tomorrow (2007), Chancellor Steve Ballard has

targeted deficiencies in retention and graduation rates of students within the institution as one

direct result of the timely University of North Carolina System accountability effort.

Citing heightened awareness of retention and graduation rates imposed by University of

North Carolina System prompts, East Carolina University purchased a student monitoring system

for its potential effects on retention (J. Geissler, personal communication, November 30, 2012).

Reaching beyond the quantitative statistical analyses conducted by the University of North

Carolina System is imperative in order to highlight areas of concern and uncover specific factors

associated with retention and graduation of students at East Carolina University. This research

study aims to provide additional evidence to existing literature concerning student engagement in

higher education.

One such area of concern illuminated by East Carolina University's administration is the

retention of first-year students to their sophomore year (ECU Tomorrow, 2007; J. Geissler,

personal communication, November 30, 2012). In the face of ever-increasing demands for

accountability, East Carolina University has put a great deal of focus on first-year programming

in order to encourage more students to continue enrollment into their third semester (J. Geissler,

personal communication, November 30, 2012). Corbin (personal communication, 2010) points to

the formation of the Office of Student Transitions and First Year Programs, in addition to the

implementation of a professional academic advising collaborative to address first-year student development, as examples of the institutional commitment to improving first-year student retention rates. East Carolina University also implemented an early alert system, Starfish™, to monitor student progress in courses and provide campus-wide connectivity to improve student success (Wasley, 2007). The issue facing the institution is to determine if the monitoring system truly promotes and supports the associated goals. This study investigates the assumption that the early alert system employed by East Carolina University provides students with enhanced linkages to campus resources to increase student engagement. The purpose of this study is to extend current research on student engagement and early alert systems by investigating student perceptions about early alert system usage.

Conceptual Framework

The study is based on Astin's (1996) theory of student involvement as it specifically addresses the idea that students learn more when they are involved in both academic and social aspects of the collegiate experience. Student engagement is generally considered to be a predictor of learning and personal development for college students (Carini, Kuh, & Klein, 2006). The more quality resources that exist for students, the more likely it is that participating students will grow and develop. Faculty interaction, both inside and outside the classroom, in combination with high-quality university intervention programs and policies, provides a greater opportunity for students to be retained and to succeed (Umbach & Wawrzynski, 2005).

An involved student is one who devotes considerable energy to academics, spends a lot of time on campus, participates actively in student organizations and activities, and interacts often with faculty (Astin, 1984). Astin's (1996) expanded view of student involvement trumps traditional pedagogical approaches because it focuses on the motivation and behavior of the

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student. Unifying institutional energies into developing and administering involvement opportunities can greatly improve student satisfaction, retention and graduation rates, and academic success (Kuh, Cruce, Shoup, & Kinzie, 2008; Wilcox, Winn, & Fyvie-Gauld, 2005). Through this conceptual lens, it is apparent that the most crucial component in enhancing student involvement is the deliberately planned opportunities and experiences that breed and motivate student engagement.

Research Questions

This study attempts to analyze multiple questions related to this theory:

1. Do students perceive early alert systems to increase their sense of belonging to campus?

2. Does the use of early alert systems increase student satisfaction with their education?

3. Do early alert notifications increase student motivation to utilize campus resources?

4. Do differences exist in the perception of early alert systems based on demographics?

Significance of the Study

This study is significant because it provides research regarding the use of early alert systems as it relates to student involvement on college campuses. This study will provide structured evidence for the effectiveness of early alert systems to improve student engagement and involvement on college campuses. Astin (1996) links student development with student involvement through interactions with faculty and peers. Such connections provide increased opportunities to retain students to their sophomore year, ultimately increasing the likelihood of graduation. This study will provide a research foundation regarding the use of early alert systems in relation to Astin's (1996) student involvement theory as a vehicle for improving student retention and graduation rates.

Moreover, this research will add to existing research on student engagement and early alert systems, since tangible research is limited. By understanding the perceptions of students about the usage of early alert systems, faculty and administrators may use the results from this study to supplant existing information about intervention practices in undergraduate education (Berger & Milem, 1999). Academic leaders who seek to craft and employ quality student retention strategies in higher education may utilize the results of this study when considering appropriate responses to increased demands for enhanced student retention and graduation rates.

Operational Definitions

The following list of terms is provided to assist in comprehension of the study because the meanings and interpretations of these terms may vary according to the individual user and/or institution.

Academic Competence – a multidimensional construct composed of the skills, attitudes, and behaviors of a learner that contribute to academic success (Astin, 1999; DiPerna & Elliott, 1999, 2002; Reason, Terenzini, & Domingo, 2006).

Attrition – reduction in institutional enrollment due to non-completion; i.e. students "dropping out" (Bean, 1980; Pascarella & Terenzini, 1979, 1980; Spady, 1970; Tinto, 1975, 1982, 1987, 1993, 1999).

Course Management System – a software system that is specifically designed and marketed for faculty and students to use in teaching and learning, which includes course content organization and presentation, communication tools, student assessment tools, gradebook capabilities, and functions that manage course materials and activities (Morgan, 2003).

Early Alert/Warning System – an integrated software system that initiates faculty, student, and campus resource communication and collaboration to promote intervention

strategies that support retention and persistence (Holliday, 2012; Safer & Fleischman, 2005; Wasley, 2007). Early alert/warning systems utilize various technologies, including centralized documentation, calendar integration, tutor management, student support management, attendance tracking, and communication tools (Holliday, 2012).

Engagement – students' willingness to participate in routine campus activities through making a psychological investment in learning (Kuh, 2001; Kuh, 2003; Kuh, Cruce, Shoup, & Kinzie, 2008; Umbach & Wawrzynski, 2005). For the purpose of this study, engagement and involvement will be used interchangeably.

Disengagement – students' deliberate and intentional failure to become involved in academic environments (Astin, 1975, 1977, 1997; Tinto, 1982).

First Year Experience – intentional institutional initiatives designed to improve the first year of college, typically incorporating academic, experiential, interpersonal, and emotional activities to promote student engagement and development (Upcraft, Gardner, & Barefoot, 2005).

Higher Education – institutions which provide formal academic programs of instruction with curricula guided toward specific competencies (Chickering, 1969).

Intervention – a strategic method intended to influence student behavior toward a specific goal (Bishop, 2004; Kuh, 2006).

Intrusive Academic Advising – a proactive approach to academic advising utilizing structures that incorporate intervention strategies that mandate advising contacts with students who otherwise might not seek advising services (Earl, 1988; Glennen, 1975; Varney, 2007).

Involvement – refers to the amount of physical, emotional, and psychological energy that students devote to the academic experience (Astin, 1999). For the purpose of this study, involvement and engagement will be used interchangeably.

Persistence – the desire and action by a student to start and complete a specific academic program (Berger & Lyon, 2005; Seidman, 2005).

Retention – the institutional ability to retain a first-time, full-time (FTFT) student enrolled in 12 or more credit hours during the first semester to the first semester of the sophomore year (Seidman, 2005).

Stop out – a student's temporary departure from an institution (Berger & Lyon, 2005).

Student Development – refers to the body of theories related to how students gain academic and experiential knowledge in post-secondary education environments, focusing on individualized student needs, holistic student development, and personal student responsibility (Astin, 1984; Chickering & Gamson, 1987; Upcraft & Gardner, 1989).

Student-Faculty Interaction – the level of personal student interaction with faculty members. Interactions may exist through classroom participation, mentor relationships, outside of class communication, scheduled meetings, research collaborations, and/or campus committee participation (Astin, 1999; Bean, 1985; Chickering & Gamson, 1987; Kuh & Hu, 2001; Pascarella & Terenzini, 1977).

Withdrawal – the departure of a student from an institution (Bean, 1980; Seidman, 2005; Spady, 1970).

Scope and Delimitations

This study covers only one university within the University of North Carolina System. The sample population selected for this study is limited to first-time, full-time freshmen enrolled

at East Carolina University for the fall 2013 academic semester; thus, the ability to generalize to the entire population of East Carolina University or beyond its confines is limited. The sample, however, is similar in nature to the population that attends other state-supported, public four-year institutions in the United States and can thus be generalized. Although many issues face college students, including affordability, academic standards, and adjustment, this study addresses whether early alert systems promote student engagement to retain students. The results of this study could be generalizable to first-time, full-time freshman students who are enrolled in a state-supported, public four-year university in a consolidated university system.

Limitations

Limitations include the fact that this study was not longitudinal in nature, following students until graduation. Existing research on the topic of early alert systems is not extensive; therefore, this study faces a limitation based on the absence of concrete statistical inquiry. Additionally, participants in this study were limited to those enrolled in undergraduate courses taught in the fall semester of 2013. Participants' responses were self-reported, and it is assumed that participants gave honest responses. The voluntary participation model utilized for this study results in the appearance of a sample of convenience; however, the student population could potentially be representative of freshman class profiles at similar institutions. Students electing to participate in this study may have existing personal perceptions that could skew results. This study was conducted at one institution; therefore, the results can only be generalized to peer institutions with similar enrollment and student populations.

Summary

Institutions bear the brunt of the burden to keep students in school; however, a plethora of reasons exist for low retention numbers nationwide. To date, very few research studies have

successfully addressed the effectiveness of programs directed towards increasing retention. In a time where accountability demands and mandates to increase retention and graduation rates are abundant, studies that do such are highly timely and necessary to provide roadmaps for progress. This study provides a timely response to the accountability demands facing academic leaders in higher education by investigating the application of early alert systems as a means to connect students to college campuses and to improve retention. This study adds to the existing research on student involvement and provides key suggestions for campus officials to consider when crafting and implementing strategic retention measures.

Organization of the Dissertation

This dissertation is divided into five chapters. Chapter One provides an introduction to the study and the appropriate background information. Chapter Two encompasses a review of literature on student involvement/engagement, retention, student development, attrition, and interaction within the context of higher education. Chapter Three describes the methodology of the study in addition to details related to procedural elements. Chapter Four contains a complete analysis of data collected through the study. Chapter Five summarizes the study and discusses the findings and their implications for higher education and suggestions for future research.

CHAPTER 2: REVIEW OF THE LITERATURE

Examination of student perceptions about early alert systems allows for greater insight into how campuses can retain and graduate students. Gauging student opinion of early alert systems, ability to motivate students to seek resources, and the development of a strong sense of belonging are all important to student success. The exploration of students' perceptions of the early alert process will supplement existing strategies about engaging students through the use of technological advancements such as Starfish™ Retention Solutions. Understanding and implementing successful tactics to increase student engagement are a key component of student retention (Kuh, Kenzie, Schuh, & Whitt, 2005). The need to understand how students truly see the strategies and tactics used by institutions to monitor student success guides this research.

The purpose of this chapter is to provide a comprehensive outline of literature related to early alert systems and to provide a framework of student persistence in higher education through historical and contemporary contexts related to the study. Tinto's (1975, 1987, 1994, 1997, 2012) theories of college student persistence and integration served as the theoretical lens for analysis for this study. Specific literature related to national and state perspectives and historical context of the issues of student engagement, retention, and persistence in higher education and the use of early alert and intervention systems are included. National and state responses to early intervention strategies to increase retention and graduation rates are examined within the literature for this study. Studying the dynamics of early intervention models has implications for institutional leaders who attempt to establish early alert systems designed to increase student engagement, involvement, and connection to campus.

Student Persistence in Higher Education

The problems that institutions face related to student retention and graduation are multifaceted. Factors that affect exactly why students persist to degree completion vary and are extremely hard to isolate and identify. Typically, finding generalizations that apply to the majority of student populations is difficult due to uncontrollable factors related to individual students and their unique personal situations and circumstances (Tinto, 2006). As a result of difficult economic times that have produced increased attention to performance-based funding models, programs on college campuses perpetually have to defend their worth (Dingman, Madison, & Madison, 2011). That can be difficult when assessment and statistical proof are not viable options, leaving some programs to depend on non-traditional means to support their cause. Many early intervention, student engagement, and retention initiatives search for tangible ways to prove that their existence is warranted and deserves funding and institutional support. Finding reasons for student attrition and solutions to improve low retention and graduation rates are complex ventures, but are very important for the future of higher education.

Hagedorn (2005) notes that extensive ramifications exist when students leave college prior to completing an undergraduate degree. The decision to persist until graduation is a decision that has consequences and benefits, not only for the student, but also for employers, institutions, parents, and governmental entities (Wyrick, 2014). A student who leaves college without graduating typically does not make up tuition through employment, and a college graduate has higher average lifetime earnings than a non-graduate. Attrition also has an impact on institutions, for students who leave represent a loss of a major in a specific academic department, which can be seen as a loss of human capital in that field (Trowler, 2010). The retention of students is fundamental to institutional mission in higher education. High rates of

student attrition not only create financial issues for colleges, but represent a symbolic failure by the institution to achieve its purpose: to educate.

Student retention and graduation are complex personal, social, and academic enterprises that require extensive institutional partnerships to link students to proactive support systems that promote success, engagement, development, and completion (Moxley, Najor-Durack, & Dumbrigue, 2013). Although many retention and graduation conversations are statistical in nature, focusing on precise numbers of students leaving and returning each semester, the issues involved are far from scientific. Individual students and the life situations they encounter provide the backdrop for student retention and graduation research. The majority of student persistence literature found for review comes from the latter part of the 1980s to the present, notably due to the increased interest in student development as it relates to retention and graduation rates (Barefoot & Gardner, 1993). Additionally, in that timeframe an abundance of retention initiatives have flooded higher education and become commonplace on college campuses (Kuh, 2007a; Kuh 2007b; Seidman, 2005; Tinto, 2008).

The question of why colleges and universities should pay attention to retention revolves around student development issues, financial issues, and obligations to admitted students (Seidman, 2005). Developing critical thinking skills, potential contributors to society, a prepared workforce, tolerance of diversity, and appreciation of life-long learning opportunities are key components of the student development Seidman described. Seidman observed that financial consequences of students not being retained are extensive and include burdens to students, parents, taxpayers, and institutions. On average, students who earn a bachelor's degree earn more than those who do not (U.S. Census Bureau, 2013). Keeping students enrolled in college through degree completion is financially cost-effective in a myriad of ways. Institutions boasting high

retention and graduation rates are typically viewed as more successful by stakeholders and the public eye (Hagedorn, 2005). Enrollment management administrators nationwide look for means to retain students and their tuition monies.

Singleton-Jackson, Jackson, and Reinhardt (2010) and Knutson (2012) explain that contemporary students in higher education are educational consumers, equipped with a sense of academic entitlement and a belief that they must shop for the best college deal. This phenomenon places pressure on colleges and universities to see themselves as businesses, seeking to meet the needs of the consumer. Associated with the institutions' obligation to retain students are the reasonable expectation for success, loss of non-renewable time, limited future educational opportunities, the ability to upgrade skills for job advancement, and the detrimental effects of unhappy students telling about their experience (Borrego, 2002; Seidman, 2005). In addition to the national focus to keep students enrolled and progressed to graduation, institutions face the simple pressure from students and their parents to retain the students they recruit, provide them with quality educational experiences, and prepare them for future endeavors. Students not retained face financial, social, and employment hurdles and the effects of low retention rates damage the reputation of institutions. In fact, Wilson (2014) has suggested that retention is also connected to the financial or economic standing of many institutions, and cited colleges and universities in 25 states where performance requirements must be met to receive funding as an example.

Historical Student Persistence Perspectives

In early higher education, degree completion was not a concern and institutions rarely focused on anything more than survival (Berger & Lyon, 2005; Goodchild & Wechesler, 2008; Thelin, 2004). The idea of college student mortality that examined factors in college student

retention including time to degree, specific times during education when attrition was prevalent, and even the impact of college size (McNeely, 1937). The college student mortality theory introduced higher education to the importance of examining student attrition and the failure of students to graduate (Berger & Lyon, 2005). Remaining the focus of student retention study for multiple decades, student mortality theory formed the basis of higher education inquiry into why college students did not graduate. Gekoski and Schwartz (1961), Panos and Astin (1968), and Feldman and Newcomb (1969) catalyzed the study of undergraduate retention through the mortality attrition model and began to shape this subfield of study in higher education.

The second wave of retention awareness was a direct result of the influx of nearly two million veterans who made their way into higher education at the conclusion of World War II via accommodations provided by the G.I. Bill (P.L. 78-346, 58 Stat. 284m) G.I. Bill (Thelin, 2004). Demetriou and Schmitz-Sciborski (2012) reported that by the 1960s access to higher education increased significantly, causing a great strain on campuses nationwide. Such access expanded educational opportunities for middle and low-socioeconomic students, underserved student populations requiring more institutional resources, and overextended campus facilities. Consequently, it was during this time that administrators became more concerned with enrollment, retention, and graduation rates (Berger & Lyon, 2005). The Higher Education Act of 1965 provided the final push college and university leaders needed to invest resources and strategies fully to improve retention. The Act increased access to college by providing monetary and academic support to keep students enrolled and to help them succeed (McDonough & Fann, 2007). As the 1960s ended, the American Council on Education was calling for a comprehensive and systematic examination of student attrition (Berger & Lyon, 2005). The decade thrust

research and development of retention and graduation-based initiatives into the forefront of the conversation within higher education.

The stage was set for tangible research into student retention theory and increased publications from student development theorists working to investigate college student attrition. Summerskill (1962) introduced the idea that students' personality traits, characteristics, and attributes were direct indicators of persistence and attrition. Infusing personality awareness with existing retention efforts paved the way for modern student development, engagement, and retention initiatives that are person-centered and individualized. The attention to student motivation related to student attrition was the cornerstone of Summerskill's findings. The idea that students' behavior, attitudes, and satisfaction can be influenced by external and internal factors suggests that retention and attrition are multi-causal and difficult to predict. Manipulation of factors associated with student attrition and retention gained traction through the 1960s (Morrison & Silverman, 2005). Student-centered, individualized approaches to student engagement and involvement programming, academic outreach opportunities, and extracurricular experiences continue to be major aspects of college student retention research.

Berger and Lyon (2005) suggested that the 1970s were the beginning of the study of college student retention and development as it exists today. The time period introduced dynamic research that proved to be field-altering and foundational in nature. From Summerskill's findings, Spady (1970) explored the interaction between student personality characteristics and the actual campus environment, bridging the gap between the individual student and college choice. Institutions of higher education are diverse entities, founded upon different missions, goals, and student populations, thus possessing unique organizational cultures (Birnbaum, 1988; Weick, 1987).

The theoretical additions of the 1970s also introduced the notion that institutional enrollment can impact retention and graduation rates. Kamens (1971) utilized data from multiple institutions to demonstrate that colleges and universities of larger enrollments and complexity had lower attrition rates. Furthermore, Kamens (1977) pointed out institutions of higher education, specifically those with larger enrollments, affect individuals and the educational environment by creating membership categories, legitimizing the social rights and meanings attached to these groups, and ritually certifying individuals as members. Providing students with opportunities to be involved and to belong is a cornerstone of Kamens' work. Although student retention and graduation research was not yet a science, recognizing that there are diverse factors affecting attrition prepared higher education for the plethora of student development theories that would be introduced.

Coon (1970) postulated that students in higher education are in a constant state of change and are, therefore, continually facing developmental crises. Among these crises are changing relationships with parents and friends, developing a value system, and choosing a major and career path. Resolution of the crises, whether positive or negative, is directly related to what students experience academically, socially, and personally (Rogerson & Poock, 2013). Such progression through developmental crises requires students to form priorities. Maslow (1943) suggests that the progression must go through hierarchical stages based on student needs. According to Maslow, individual student development will be stymied if lower level needs such as belonging and connection are not met. Student perception, engagement, and involvement tend to be strong predictors of retention and attrition (Kuh & Love, 2004).

The findings of Perry (1970) add to the theory of student growth by addressing cognitive maturation and by following the development of cognition related to knowledge, truth, values,

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responsibility, and beliefs about life. Perry's work introduced four schemes that explain college student intellectual development. The first stage, dualism, is indicative of the student assumption that there is a single right answer to questions and teachers are purely fact providers. Next in the progression is multiplicity, where students develop subjective knowledge and acknowledge that conflicting answers exist; therefore, one's inner voice, judgment, and beliefs should be trusted over external authority. Relativism, the third stage in Perry's theory, is where students learn to make judgments and opinions that are based on values, experiences, and knowledge. Finally, students reach commitment, the fourth stage in Perry's model, where knowledge learned from others is integrated with personal experience and reflection to establish active affirmation of self and identity in this stage. Perry's intellectual and moral development stages serve as a useful framework for understanding students and how they develop and provide information to assist in implementing retention programming opportunities (Gibbs, 1981; Perry, 1970; Zhang & Watkins, 2001).

Spady (1971) also highlighted the correlation between academic performance and student attrition, citing that students with better grades tend to be retained at a higher rate compared to those with lower scores. Although Spady (1970, 1971), addressed the sociological model of college student attrition, Tinto's (1975, 1993) model revolutionized the research. Tinto's model of student integration linked structured and unstructured academic experiences with social integration factors. He concluded that the degree of academic success a student has in higher education directly influences the level of commitment a student has to the institution, academic goals, and career goals (Tinto, 1975).

Throughout the history of higher education, whether considering student mortality, attrition, persistence, retention, or graduation to be the chosen word, awareness and attention to

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student degree completion has significantly increased. Beginning as a theoretical debate in its earliest iteration, student retention can be considered one of the current cornerstones of higher education's success. Although analysis of student retention has evolved over time, the commitment to providing quality instruction and educational experiences to students is paramount. Student retention and attrition are enduring topics. Identifying at-risk populations can help institutions sharpen their recruiting efforts, refine its marketing methods, and identify any needed improvements in services to students in the educational process. The movement throughout the history of student persistence research in higher education has become more technologically dependent by the decade (Davis, Deil-Amen, Rios-Aguilar, & Gonzalez Canche, 2012; Woodley & Silvestri, 2014).

Moving into contemporary student retention planning requires institutional commitment to innovative ways of thinking and doing regarding strategic retention development. Tinto's (1975) research article sparked nearly a 40-year dialogue on student retention and persistence in higher education. Today, although attacked, revised, and expanded, the literature associated with student navigation through postsecondary education remains linked to the idea of students and how they interact with institutions. Nonetheless, the history of student persistence details the difficulty and intricacies involved in strategic retention planning.

Tinto's work (1975, 1987, 1994, 1997, 2012) has been instrumental in furthering retention and attrition research in higher education. His work is also used as a basis for this study. Retention initiatives are grounded in student development theory, involving growth and development of the whole student through opportunities for students to improve self-awareness, strengthen academic skills, and build a base of knowledge (Clarkson, 2007). Tinto (1993) revised his student integration model to describe academic and social integration with the formal and

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informal academic and social structures within an individual institution. Tinto also elaborated on specifics related to decision making processes concerning student goal commitment and dropout, the need to mesh student expectations to campus mission, and the transitions made by students in the college process (Swail, 2004). The factors responsible for student attrition, such as a feeling of isolation, difficulty adjusting to a new environment, and an inability to integrate new information and knowledge with previous learned information and knowledge, are fundamental to Tinto's (1987) retention theory.

Factors Associated with Student Persistence

Research shows that economic advantages exist for students who graduate college compared to those who do not (Day & Newburger, 2002; Dee, 2004; Ross & Wu, 1996). The historical lineage of student persistence theory points to students' academic, social, and cultural integration having a major impact on intentions to persist. Institutions have great opportunities to provide integration experiences to increase student retention and graduation rates based on several key factors that impact student persistence. Tinto's (1975) model of student persistence, along with subsequent revisions and additions from other researchers, explains that students who are more integrated academically and socially tend to be more successful in college. Individual characteristics and goals, interactions with peers and faculty, and extracurricular experiences also impact student decisions to persist (Jensen, 2011).

Colleges and universities cannot afford to ignore student persistence and incorporate strategies to improve retention and graduation rates. Braxton (2000) noted that there are high costs associated with student attrition. In addition, literature on factors affecting student persistence and existing best practices to make institutional improvements is lengthy (Berger & Lyon, 2005; Braxton, 2000). Much of the literature related to factors impacting student

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persistence at the individual and institutional level is based on Tinto's (1975, 1993) model on student integration in higher education.

Academic Preparation and Performance

It is said that "the biggest single predictor of an institution's retention and graduation rates is the academic preparation level of its students" (American Association of State Colleges and Universities, 2005, p. 26). The national trend in the United States is towards a model of academic preparation for students to pursue education or training after completion of their high school requirements (Chait & Venezia, 2009). The message of the importance of a college degree is apparent; as of 2004, 69% of high school seniors expected to obtain a bachelor's degree or higher and another 18% intended to complete some postsecondary education (NCES, 2006). College enrollments also reflect the perceived importance of matriculation; enrollment rates of college-aged students increased from 49% in 1972 to 67% in 2011 (NCES, 2013). Specifically, in 2011 the enrollment rate at four-year colleges was 60% higher than the rate at two-year colleges (NCES, 2013). Of note during this timeframe are the enrollment patterns of males and females, since higher growth was experienced in female college enrollments (NCES, 2013). The message concerning the benefits of higher education, explicitly bachelor's degrees, is clear, college graduates earn more, have better opportunities, engage more, and have a higher quality of life (Osterman, 2008).

Unfortunately, although enrollments reflect growth and value to higher education, once students arrive on campus, many are often not prepared to take on the challenge of college-level coursework (Kirst-Ashman, 2007). According to the Department of Education (2004), college remediation rates continue to grow, and the DOE estimates that nearly a third of all freshmen in four-year colleges, and over half of freshmen at two-year institutions require some sort of

preparatory coursework. In 2005 (ACT), only 51% of high school graduates who were tested met ACT's "college readiness benchmarks" for reading and only 22% of the 1.2 million high school seniors who took the ACT in 2004 met their college benchmarks in biology, algebra, and English composition. The lack of standardized student academic readiness thresholds create many issues in higher education, because institutions offer varied strategies and remediation levels that are not compatible when compared to other institutions (Conley, 2007).

California, Indiana, and Massachusetts are states that led the campaign to prepare students more effectively and equally for college by implementing assessment and readiness initiatives that link high schools to state university systems to promote college readiness (Chait & Venezia, 2009). Additionally, federal and state governmental programs such as early college high schools, dual enrollment, and college readiness campaigns geared towards academic and vocational skills have been introduced (Oakes & Saunders, 2007). Special programs to provide funding for such initiatives are sourced from the No Child Left Behind Act of 2001, the Higher Education Act of 1965 and 2008, and the Carl D. Perkins Vocational and Technical Education Act of 2006 that focus on aspects of high school to college transition (Hoffman, Vargas, & Santos, 2008). While these legislations provide monetary stimulus to college readiness, they are not dynamic enough to close the college readiness gap. More incentive-based federal, state, and local policies could provide greater awareness of the issues surrounding college readiness deficiencies and could possibly promote awareness into the national problem.

Many individual factors contribute to student readiness and researchers and policy-makers must take those factors into consideration when examining and analyzing data associated with college academic preparation. Evidence exists that federal and state policies must pay greater attention to measuring and assessing college readiness, developing greater knowledge

and awareness of college success and how to prepare students, and infusing resources to support students (Chait & Venezia, 2009; Spence, 2009). Installing measures to identify students with at-risk attributes, such as low-income students or deficient test scores, is imperative to provide sustained support at the college level (Goldberger, 2007).

The reality that student preparation is a cause for concern is evident. However, the lack of consensus about what it means to be academically prepared for college clouds that reality. Kyllonen, Lipnevich, Burrus, and Roberts (2014) explained that without universal achievement, assessment, and readiness standards, achieving education equality is virtually impossible. Forming such standards at federal, state, and local levels could synchronize efforts and lay the foundation for improvements to staggering numbers of students unprepared for college learning (Soares & Mazzeo, 2008).

High rates of remediation, flat rates of student retention and graduation, and increased time to degree completion lend credence to the idea that many students are not fully ready to succeed academically in college (Chait & Venezia, 2009). In addition to the issue of academic preparation, colleges also face stagnant completion rates as a result of the admission of underprepared students. Nearly 83% of high school graduates enroll in some form of college, but only 52% of students complete their degrees (Goldberger, 2007). Within the larger student persistence focus by education researchers and policy-makers, Boatman and Long (2010) pointed out that weak academic preparation is a growing concern. Providing appropriate support for those students, who are prepared, in addition to those who are not, presents a great challenge for institutions.

Chait and Venezia (2009) also posit that the reasons for the increasing focus on postsecondary readiness and preparation lie with the accountability movement, spurred by higher

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education's poor educational attainment, the status of the nation's economy, and education quality concerns. Issues related to the lack of academically prepared students entering college lead to problems for institutions in supporting and assisting those underprepared students. Concrete information concerning college life including information about financial aid, academic expectations, admission, placement, and policies and procedures to remove hurdles for students can improve college readiness (Briggs, Clark, & Hall, 2012).

One of the most common methods of evaluating student persistence is through academic achievement, measured by grade point average (GPA) (Bean, 2005; McGrath & Braunstein, 1997; Tross, Harper, Osher, & Kneidinger, 2000). Robert (2008) indicated that academic success in college can be influenced by a number of factors including choice of major, academic success, and as discussed above, academic preparation. Allen, Robbins, Casillas, and Oh (2008) discovered that students who perform at a high level during their first academic year of college are typically retained and graduate with fewer barriers. Additionally, academic performance is considered to be one of the strongest influences on student persistence (Becker, Cooper, Atkins, & Martin, 2009; Pascarella & Terenzini, 2005; Pietras, 2010). It is logical to believe that students who experience successes will be more invested in their academic progression and will seek degree completion.

Conversely, students who do not have a successful first year face trouble. Morisano, Hirsh, Peterson, Pihl, and Shore (2010) suggested that early departure from college can be caused by poor academic progress and lack of clear goals and motivation. Furthermore, poor academic performance can also result from inconsistencies related to student expectations of college coursework and expectations of their abilities (Braxton, Hirschy, & McClendon, 2004). Academic difficulty is common for many college students but can be particularly problematic for

students with limited financial resources, those from underserved populations, and for first-generation college attendees (Brashear & Baker, 2003). As retention, persistence, and graduation become more visible through indicators of academic progress and success, it becomes more and more important to address academic difficulty, particularly for the success and retention of both at-risk and high potential students alike.

Pascarella and Terenzini (2005) pointed out that academic performance, as a whole, impacts heavily a student's intention to persist and graduate, perpetuating Bean's (1982) earlier assertion. Allen (1999) also concluded that an empirical link between motivation and persistence exists, citing first-year college GPA as a direct influence on students continuing their matriculation. Additionally, the higher a student's GPA, the more likely the student will be retained by the institution to the second year (Murtaugh, Burns, & Schuster, 1999; Pascarella & Terenzini, 2005). Tinto (1993) noted that students with low GPAs tend to leave college due to existing institutional policies regulating acceptable academic progress, or they leave because of the negative connotation associated with poor academic performance. For this reason, institutions search for methods to help students to transition to collegiate rigors as soon as possible in order to combat attrition.

In addition to academic preparedness, other pre-college issues can impact student academic performance in college. Research on first-year college students suggests that such pre-college characteristics influence academic achievement and provide capabilities for predictive analysis (Bauer & Liang, 2003). High school GPA has more predictive ability than any other pre-college characteristic (Daugherty & Lane, 1999; DeBerard, Spielman, & Julka, 2004; Noble & Sawyer, 2002). The lower students perform in high school, the lower academic success they

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will experience in college according to predictive analytics based on high school GPA (Hu &
Wolniak, 2013).

Although high school GPA tends to garner the greatest notoriety for predicting student
success in college, other pre-college characteristics are also believed to be valid influencers of
college academic performance. Other background characteristics such as gender, standardized
test scores, ethnicity, parental education level, and parental income can also have an effect on
college academic performance in the first year (Bean, 1982; Bean 2005; Pascarella & Terenzini,
2005; Terenzini, Theophilides, & Lorang, 1984).

Student self-perception of abilities can also provide insight into potential college
academic achievement. Bauer and Liang (2003) found that students' confidence level in their
abilities was a good predictor of first-year college GPA. Additionally, future academic
achievement is also predicated on student self-perception, following in line the linkage to GPA
level and personality type (Hamacheck, 1995; Hickman, Bartholomae, & McHenry, 2000;
Pritchard & Wilson, 2003; Zheng, Saunders, Shelley, & Whalen, 2002). Students' belief in their
own abilities has a strong presence in the literature about academic success and degree
completion.

In addition to student self-perception of their abilities, students' educational aspirations
are a "fundamental part of the attainment process and yet are among the least understood
concepts in higher education" (Carter, 1999, p. 6). Examining the aspirations and goals of
students in higher education is extremely important, because college students' educational plans
and intentionality to complete their degree are correlative to their doing so (Hull-Toye, 1995;
Pascarella, Smart, & Stoecker, 1989). Strong educational aspirations are a good predictor of
academic performance, successful retention, and ultimately degree completion. Once considered

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a great predictor of college potential, standardized tests have lost momentum as a success indicator and are not as accurate a predictor of academic performance as high school GPA (Zwick, 2013). Boatman and Long (2010) note that many institutions have even removed standardized test scores as admissions requirements in lieu of more comprehensive enrollment strategies. Other pre-college attributes allow for considerations to be made during admissions review.

Student Development

The concept of student development involves the growth of the whole person through the promotion of academic interventions that address self-awareness, strengthen academic skill-sets, and build a base of knowledge (Clarkson, 2007). Student development in higher education originated in a European concept *in loco parentis*, which is described as a way for institutions to act on the behalf of and in partnership with parents to cultivate students' moral, ethical, and character development (Astin, 1984). Grounded in educational psychology, student development has moved through many stages throughout the history of higher education in the United States. In the early 1900s the field focused on conditioning students to abide by strict social norms. However, through the emergence of educational reform, the mid-1900s shifted the student development paradigm towards student services and intellectual cultivation, away from rule following (Evans, Forney, Guido, Patton, & Renn, 2010). The study of student development theory enables professionals be proactive in identifying and addressing student needs, designing programs, developing polices, and creating college environments that encourage student growth.

Student development is associated with the work of Maslow (1943), who introduced the idea that students must progress through a hierarchy that focuses on satisfying needs. Specifically, students transition from being physiologically satisfied and experiencing feelings of

safety to a deeper sense of belonging and being cared for to a progression towards self-esteem and self-actualization (Maslow, Frager, & Cox, 1970). Hones and Sullivan-Vance (2005) suggested that it is difficult to focus on ideas of higher order when the basic needs required for survival are in danger. Students and institutions alike follow this mentality in stressful times, shifting focus to the basic requirements to ensure survival. Students cannot succeed unless basic needs are met, nor can administrators be expected to provide successful programs without proper resources. Institutions must keep student needs prioritized when developing and implementing programming to build the whole student. As Maslow (1943)(Maslow, Frager, & Cox, 1970) noted, ignoring basic needs of students can sabotage student development opportunities.

The historical lineage of student development theory brings attention to the idea that college student development is important and comprehending the unique environment that college campuses prove to be is imperative for successful persistence initiatives. Professional associations such as the Council of Student Personnel Association (COSPA) and the American College Personnel Association (ACPA), in addition to private ventures, have paved the way to reconceptualize the roles and mission of student support services on college campuses (Mattox & Creamer, 1998; Nuss, 2003). The Committee on the Student in Higher Education, originating with the Hazen Foundation, encouraged campuses to focus on the human development of their students and introduced the idea that the responsibility of the institution was the development of the whole student (Garland & Grace, 1993). Nonetheless, the early stages of student development awareness still provide the foundation for contemporary student affairs personnel on campuses today.

College students experience a constant state of flux and change and are considered to be in perpetual development crisis or conflict (Coon, 1970). How students move through changing

relationships, developing value systems, and choosing majors and careers is resolved through academic and social experiences on campuses. Perry (1970) proposed that student growth is related to cognitive maturation through knowledge, truth, values, responsibility, and life. Development through cognitive realms allows students to work towards self-affirmation and identity in college.

Expanding student development theory further, Chickering (1969) and Chickering and Reisser (1993) suggested that students work through a series of mileposts, or vectors, of development that include developing competencies, managing one's emotions, forming independence through autonomy, cultivating mature interpersonal relationships, and establishing identity, purpose, and integrity. Specifically, the first vector explains that intellectual, physical, and interpersonal competence is gained from knowledge individuals are able to achieve. Managing emotions, which is the second vector, consists of learning to comprehend, accept, and express emotions including anxiety, depression, guilt, anger, shame, inspiration, optimism, and humility in appropriate manners. The third vector moves individuals through autonomy toward interdependence and becoming emotionally independent. Within the fourth vector, individuals learn to understand and value others and relationships with others, providing greater tolerance and appreciation for differences. Building on the previous vectors, vector five involves establishing identity and increased comfort with oneself to the point that feedback and criticism can be accepted without animosity. Vector six thrusts individuals into commitment to the future through decisions that create and cultivate a sense of purpose. The seventh and final vector includes three stages that produce humanizing values, personalizing values, and developing congruence that shift students through isolating behaviors and thoughts toward seeing oneself as a part of a larger collective, viewing oneself aligning actions with beliefs.

The theory of Seven Vectors of Psychological Development explain that students move through the first vectors involving knowledge acquisition, development of critical thinking and communication skills, problem solving and tolerance, and the acceptance of diversity to progress towards the later vectors (Evans, Forney, Guido, Patton, & Renn, 2010). The final stages lead to students establishing identity, setting goals and defining direction, and connecting beliefs to their behaviors (Chickering & Ehrmann, 1996). Progression should occur throughout the matriculation of the student, culminating with successful degree completion.

Applying much of Chickering's earlier work, Chickering and Gamson (1987) released a student development focused guide for institutions entitled *Seven Practices for Good Practice in Undergraduate Education*. The principles have been among the most influential student development ideas of the past two decades and remain as guides for institutions for developing opportunities to improve student experience and to promote development. Their suggestions for campuses included encouraging student and faculty contact, developing reciprocity and cooperation among students, utilizing active learning techniques, providing prompt feedback to students, emphasizing task completion, communicating high expectations, and respecting diversity in terms of talents and learning styles of students (Chickering & Gamson, 1999).

Tinto's (1975) inquisition on student attrition in *Dropout from Higher Education: A Theoretical Synthesis of Recent Research* pushed higher education to connect student development deficiencies to student persistence. Though grounded in student development, Tinto's contributions highlighted student engagement and involvement as precursors for developing students. Revisions and offshoots of the work of Tinto have transitioned student development theory into multi-directional tangents. Contemporary theories about developing students fall into four different clusters including psychosocial, cognitive-structural, typological,

and college impact models (Evans, Forney, Guido, Patton, & Renn, 2010; Pascarella & Terenzini, 2005). Understanding how these diverse groupings of student development theory work to develop students as a whole provides institutional administrators platforms to promote intellectual and behavioral growth throughout the college years (Woodard, Love, & Komives, 2000).

The challenge of student retention and persistence is to celebrate the reality that not all students are alike, nor are the institutions they attend, and to provide effective developmental experiences in an attempt to retain students (Swail, 2004). Student development theory promotes collaborative efforts across campuses to maximize positive student outcomes. In regard to student persistence in higher education, student development theory perspectives illuminate the reality that students must be connected to the institution to be developed effectively and to be retained to degree completion.

Student Engagement and Involvement

With deep roots in student development theory, the research areas of student engagement and involvement in college suggest that students grow and mature only through direct connection to the institution through intentional and unintended experiences (Hones & Sullivan-Vance, 2005). Student engagement is an integral part of a quality education and plays an important role in many desirable college outcomes such as student learning, academic performance, and persistence (Astin, 1993; Hu & Kuh, 2003; Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008; Pascarella & Terenzini, 1991, 2005). Moreover, student engagement is viewed as an integral introductory piece of student development and can be described as student participation in educationally effective events which lead to measurable outcomes (Harper & Quaye, 2010).

Although sometimes treated as separate entities, engagement and involvement are used interchangeably in this study.

Kuh (2009) clarifies that "student engagement represents the time and effort students devote to activities that are empirically linked to desired outcomes of college and what intuitions do to induce student to participate in these activities" (p. 683). Research suggests that students who do not take advantage of engagement opportunities persist at lower rates than those students who make efforts to engage (Astin, 1999; Braxton, Milem, & Sullivan, 2000; Kuh, 2009; Kuh, Kinzie, Schuh, & Whitt, 2010; Pascarella & Terenzini, 2005; Pascarella, Siefert & Blaich, 2009). Wolf-Wendel, Ward, and Kinzie (2009) reported that a relationship also exists between the amount of time and effort students invest in educationally purposeful activities and desired outcomes of college. The time students spend on campus activities tends to have an impact on their thoughts and commitment to the institution. Explicitly, the more students believe that they are an active part of the university and its culture, the more likely they will be successful academically and persist (Rendon, 1985; Rendon, Jalomo, & Nora, 2000).

Astin (1977; 1985; 1993; 1996) takes student development to the next level of awareness by segmenting student engagement from the larger student development theory base, focusing on students' academic involvement, interactions with faculty, and involvement with peers. Specifically, Astin's (1970) research indicated that institutions should focus on the first years of undergraduate study to integrate and assimilate students successfully into the campus culture. Milem and Berger (1997) confirmed Astin's additions by explaining that students who don't find connecting experiences to the institution during the first two months risk being disconnected from campus indefinitely, leading to increased chance of attrition. This leaves little time for colleges and universities to connect students once on campus.

There are many factors that encourage students to connect when arriving at their college of choice; however programmatic opportunities that are intentional and immediate produce the greatest impact on student enthusiasm to engage (Kuh, 2008; Kuh, Kinzie, Schuh, Whitt, & Associates, 2010). New student programs aid in the transition of students to their new educational environments and their successful progress through their college journey. Due to the benefits associated with quick integration with the campus environment, many campuses employ pre-enrollment orientation experiences for students. The Association for Orientation, Transition, and Retention in Higher Education (NODA) provides standards and best practices for new student programming. The association reports that strong orientation programs begin the social and academic support engagement that students require to foster a sense of belonging (Mattanah, Ayers, Brand, & Brooks, 2010).

To introduce new students to university culture, policies, and rules and regulations, campuses invest many resources into orientation sessions filled with copious amounts of information directed at beginning student assimilation into campus life. Kuh (2009) pointed to orientation as one of the most important factors in freshman student success, because it is the first opportunity for students to gain first-hand exposure to the university setting. Research shows that students need assistance transitioning to college within the freshman year and the deliberate interventions and initiatives utilized can have a great impact on student persistence (Dolinsky, Matthews, Greenfield, Curtis-Tweed, & Evenbeck, 2007; Tinto & Goodsell, 1993). Students participating in first-year experience programs earn higher GPAs than students who were not involved with a first-year program (Jamelske, 2009).

Tinto's theoretical offerings (1975, 1987, 1993) also stressed the importance of connecting students to campus and its resources within the first year. Tinto (1975) discussed

freshmen transition through separation, where students distance themselves from the realities

they knew with family and high school, which can cause conflict for students in new

environments. Furthermore, Tinto (1982) postulated that institutions must supplant these

transitional situations to promote students to develop new goals and commitments to their new

environment, incorporating themselves into the campus culture and establishing connections to

peers and faculty. Promoting early student engagement is a top priority for institutions to deal

appropriately with student attachment issues that can plague student success during the transition

to college (Kurland & Siegel, 2013).

Based on Tinto's theoretical assertions, research abounds surrounding the relationship

between the student and the level of engagement or involvement with the institution and its

structures (Siedman, 1996; Torres, Jones, & Renn, 2009). Brophy (2013) adds that without the

foundational work laid by Tinto's 1975 framework, knowledge and practice of strategies for

connecting students to campus environments would be severely lacking. Tinto (1990, 1993)

revised his work to include that building a sense of community "ensures the integration of all

individuals as equal and competent members of the institution" (p. 36), which ultimately impacts

student intentions to persist. The success of student engagement activities signifies the

commitment institutions place on investing in resources to promote involvement and

enhancement of student learning outcomes and development of the whole student (Kuh, 2001).

Within the context of higher education, professionals are in place to provide students with

constructive opportunities to move them through a continuum of development, resulting in

successful graduates. Professionals constantly search for appropriate structures to provide

students with opportunities that catalyze maturation, sense of belonging, and development in

college (Pizzolato, Hicklen, Brown, & Chaudhari, 2009). Student support professionals bear the

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burden of developing, implementing, and assessing strategic activities to engage students. The reality facing administrators in higher education is one of increasing demand that they construct effective student engagement experiences in a climate of decreasing resources (Huisman & Currie, 2004).

The transition from high school to college prompts students to increase self-autonomy and responsibility (Hiester, Nordstrom, & Swenson, 2009). Assisting students in this transition, campuses have adopted first-year programs based on the research of Upcraft, Gardner, and Barefoot (2005). Programs vary in their components, strategies, and goals; however, most exhibit a familiar focus on student development theory supported by findings from Chickering and Reisser (1993), Tinto (1993), and Astin (1996). Tinto (1993) approached the relationship between student engagement and persistence, which is the primary basis for attention to freshman programming on college campuses. Students on college campuses are inundated with opportunities to get involved, increasing the need for first-year experiences to be intentional and attractive to motivate students to engage (Barefoot, 2005).

The goals of first-year experiences include promoting student interaction with faculty, advisors, campus organizations, and even other students (Baruch-Runyon, Van Zandt, & Elliott, 2009). First-year programs allow students to ease into the transition and to reduce anxiety about a process that can seem daunting and stressful. Establishing connections with their academic program, faculty, academic advisor, student organization, athletic events, and even their roommates accelerates the developmental milestones associated with detachment from parental control (Hiester, Nordstrom, & Swenson, 2009). Developing a sense of belonging on campus coupled with separation from parental attachment thrusts students into an expedited maturation

which promotes self-assurance, ultimately contributing to social support, greater life satisfaction, and personal control (Bowman, 2010).

Upcraft, Gardner, and Barefoot (2005) note that in 1987 only 37% of American colleges and universities were taking steps to improve the first-year experiences of students, while in 1995, 82% had reported first-year initiatives on their campus. Although universal best practices of programming exist, simply offering programs does not guarantee intended effects on student success at all institutions. "Institutional programs and practices must be of high quality, customized to meet the needs of students they are intended to reach, and firmly rooted in a student success-oriented campus culture" (Kuh et al., 2008). Without consideration of student development, programming efforts will only be half-hearted and lack appropriate support due to inconsistencies with campus culture. Implementations of such student experiences must come only after stringent study of the institution to assure seamless transition, adaptation, and most importantly, buy-in campus-wide.

In addition to orientation and first-year experience programs, the freshman seminar is also considered a valuable tool to engage students. Effectiveness of freshman seminars is related to their design, which aids students in connecting to the social and academic structure of an institution and is associated with improving student persistence (Barefoot & Gardner, 1993; Dooris & Nugent, 2001; Ewell, 2001; Fidler, 1991; Gordon, 1989; Porter & Swing, 2006; Tobolowsky, 2005). The freshman seminar is believed to be one of the most effective initiatives for developing student sense of belonging, combating previous attachment, and promoting student success (Carey, 2005; Reason, Terenzini, & Domingo, 2006). First-year seminar courses have become a staple of student retention strategies in the United States (Barefoot, 2000; Gardner, 1989; Gordon, 1989; Upcraft, Gardner, & Barefoot, 2005).

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Habley (2004) suggested that the interactions students have with individuals on campus who are concerned with their success and wellbeing directly influence retention. In his consideration of student engagement in higher education, Zhao and Kuh (2004) recognized that "those institutions that more fully engage their students in the variety of activities that contribute to valued outcomes of college can claim to be of higher quality in comparison with similar types of colleges and universities" (p. 1). The vast majority of literature on student engagement in higher education suggests that engagement is what students do in college instead of who they are or even where they choose to matriculate. In a time when colleges and universities are expected to attract, retain, and graduate a high percentage of their enrollment, contemporary higher education infuses student experiences with academic foci to produce more effectively developed graduates (Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008).

As previously noted, Chickering and Gamson's (1987) framework is directed toward faculty and administrators with students being the beneficiaries, who reap the rewards of engagement and involvement. Wilcox, Winn, and Fyvie-Gauld (2005) added that the role of social support in first-year experiences is to provide students with a belief they have a place at the institution and are integrated with the culture. Involvement on campuses is so important that Morgan and Streb (2001) posits that "students can actively participate in creating a positive impact on their own development and learning" (p. 78) by getting involved on campus. Campuses use athletics, religious organizations, student groups, and entertainment activities to keep students involved and attentive, in order to "develop strong identification and attachment" (Astin, 1999, p. 523) to the institution. As leaders on campuses work to improve and expand their institutions, it is imperative that they consider student engagement and involvement as key

components of influence when developing policy and plans related to increasing student persistence.

Providing practical experiences to engage diverse student populations bridges the gap between demographically different students and provides opportunities to extend the reach of traditional approaches (Harper & Quaye, 2009). Group-specific barriers present challenges for some students to feeling connected to campuses. As higher education becomes more diverse and access to college increases, institutions face the challenge to create engaging environments that prevent exclusion (Gonyea & Kuh, 2009). Student differences exist and institutions must remain vigilant in producing engagement opportunities that reach the broadest spectrum possible. McCormick, Kinzie, and Gonyea (2013) cautioned that if educators do not remain intentional about fostering conditions that compel students to be motivated to maximize their college experiences, high levels of student attrition will be a true reality.

The push for higher levels of student interaction has "encouraged educators to focus less on what they do and more on what the student does" (Astin, 1999, p. 522). Pascarella (2001) suggested that students begin their college matriculation inclined to behave in certain ways and Tinto (1999) suggested that students also enter college with expectations. Those preexisting notions that follow students from high school to college have to be broken down in order for their assimilation and buy-in to their new environment to be successful. To do so, institutions must effectively plan and implement experiences to motivate students to engage (Astin & Lee, 2003). Noting that students ultimately control their own commitment level, Pascarella & Terenzini (2005) explained that "the impact of college is largely determined by individual effort and involvement in the academic, interpersonal, and extracurricular offerings on a campus" (p. 602).

For institutions developing and implementing strategic approaches to cultivate greater student engagement as a means to promote student persistence, Kuh (2009) recommended that administrators pay close attention to assessment and quality of engagement experiences, and that they be committed to research and proven best practices. Failure to offer appropriate opportunities for students to develop a sense of belonging on campus can have detrimental effects on student persistence. In light of increased accountability and jeopardizing funding sources institutional commitment to cultivating purposeful engagement initiatives is paramount to avert a drop in retention and graduation rates (NSSE, 2013).

Engagement with Faculty and Peers

Student engagement and involvement within the institution represents a massive area of research into what determinants exist that keep students motivated to stay in school. Nearly two-thirds of the gains students make in knowledge, cognition, and social skill development occur in the first two years of college (Pascarella & Terenzini, 2005). The peer environment on college campuses shapes the values, beliefs, attitudes, and expectations that characterize a campus' student body (Terenzini & Reason, 2005). Connecting students to each other helps perpetuate campus climates. The sense of place or belonging that students receive through peer interaction although immeasurable is invaluable. Braxton and Lee (2005), Braxton (2008), and Braxton, Jones, Hirschy, and Hartley (2008) concluded that the link between social interaction, institutional commitment, and subsequent student persistence is bound by student-to-student relationships and interactions. Reason (2009) explained succinctly that social exchanges between students spark feelings of belonging and institutional commitment, cornerstones of student retention in addition to being one of the oldest indirect benefits of a college education. Commonly, student relationships formed in college typically stand strong long past graduation.

Increasing attention has been placed on the use of innovative pathways to connect students to each other to improve engagement. Once thought to be harsh to incoming students through hazing, upper-level students are being enlisted to assist students as they transition to college (Amey, 1999). Today, seasoned students are working with first-year students as orientation leaders, residence hall advisors, academic mentors, peer tutors, and co-teachers (Cavanagh, 2012; Hausman, Schofield, & Woods, 2007). Braxton, Hirschy, and McClendon (2011) noted that creating structures where upper-level students interact and support new students works to assimilate new students into campus culture, to stimulate academic motivation, and to entrench student to build institutional commitment. Many student organizations such as Greek life have formal mentor structures in place to help younger students transition to the social norms and values and to learn organizational expectations. Incorporating more tenured students to work with new students provides an additional layer of engagement.

Attempts to improve student-to-student interaction through meaningful learning experiences are at the heart of educational planning and are a core component of curriculum formation. Gonyea and Kuh (2009) suggested that cohorting students into learning communities, which includes two or more academic courses linked with the same students, is a solid option to increase student relationships. Students participating in learning communities experience greater social connection, and if the courses are thematically related, less academic fragmentation than students not participating in learning communities (Barefoot, 2000; Cavanah, 2012; Coates, 2013). The cohort model within living-learning and learning communities has gained momentum in recent years as a retention and academic success building tool. Pike, Kuh, and McCormick (2010) examined contingent relationships between learning community participation and student engagement and found that participation in learning communities was positively and

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significantly related to involvement. Considered high impact educational experiences by Kuh (2008), learning community participation is deemed as a powerful learning and success opportunity for college students.

Student-to-student interaction is a significant part of the college student experience. Astin (1993) proposed that "the student's peer group is the single most potent source of influence on growth and development during the undergraduate years" (p. 398). Barefoot (2000) noted that educators are incredibly conscious of the power of peer influence and work hard to channel or manage it within the context of planning and implementation of efforts to keep students connected. A key component of student-to-student experiences is the opportunity created for students to learn and grow from a diversity standpoint, engaging and building relationships with other students from diverse backgrounds (Loes, Pascarella, & Umbach, 2012). A significant number of first-year programs intentionally design opportunities to promote the interaction with peers necessary to form bonds and affiliation (McCormick, Kinzie, & Gonyea, 2013). Pike, Kuh, and McCormick (2011) and Zepke, Butler, and Leach (2012). Institutional research and improving the quality of student engagement. Quality in Higher Education (2012) indicate that understanding and acceptance of peers with different backgrounds and experiences builds better student-to-student interaction, promotes interpersonal relationships, and prepares students for a global world.

Also focused on engagement, student-to-faculty interaction is another force that carries a substantial impact on student retention and graduation. Pascarella and Terenzini (1977, 2005) posited that student-faculty relationships play a crucial role in the match between student and institution. Umbach and Wawrynski (2005) found that "faculty behaviors and attitudes affect students profoundly, which suggests that faculty members play the single-most important role in

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student learning" (p. 176). Students who have frequent contact with faculty members are more satisfied with their educational experiences and are less likely to drop out, and perceive themselves to have learned more than students who have less faculty contact (Astin, 1977, 1985, 1993; Bean & Kuh, 1984; Bean 1985; Cross, 1998; Feldman & Newcomb, 1969; Kuh, Schuh, Whitt, & Associates, 1991; Lamport, 1993; Pascarella & Terenzini, 1977, 1979, 1980, 2005; Pascarella, 1985; Tinto, 1993).

Student-to-faculty experiences influence changes in the cognitive, psychosocial, and attitudinal domains of students' lives, as well as their persistence and degree completion (Berger & Milem, 2000; Braxton, Sullivan, & Johnson, 1997; Volkwein & Malik, 1997). The relationships between students and the faculty they come into contact with is extremely important to student persistence. In reality, few college experiences are more strongly linked to academic success and persistence than the interactions students have with faculty members on campus (Reason, Terenzini, & Domingo, 2006). Coates (2007) explains that "students reporting an intense form of engagement are highly involved with their university study … they tend to see teaching staff as approachable, and to see their learning environment as responsive, supportive, and challenging" (pp. 132-133). The intensity of students' engagement is definitely a powerful link to intentionality and motivation.

Faculty facilitate and encourage student growth in many ways. Gaff and Gaff (1981) pointed out that "student-faculty contact is a significant factor in predicting college persistence", while Lamport (1993) noted that such interactions prove more fruitful when they extend outside the classroom. Students rate interactions with faculty that take place outside the classroom as the most beneficial; faculty develop more friendly relationships and exhibit broader concern with students' emotional and academic growth (Barefoot, 2000; Bean, 1980; Cuseo, 2007; Endo &

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Harpel, 1982; Nora, Barlow, & Crisp, 2005; Stodt, 1987). The interactions students have with faculty depend little on faculty members' pedagogical approaches (Qin, Johnson, & Johnson, 1995), contacts made within learning communities, or the context of the faculty's major department's standard values and norms (Smart, Feldman, & Ethington, 2000). Campuses placing priority on student-to-faculty experiences tend to reap retention benefits due to the residual sense of engagement created for students (Jaeger & Hinz, 2008).

Understanding student retention theory and how it can be applied can improve retention rates by assisting faculty to make more impactful pedagogical decisions. Furthermore, faculty who are aware of student development and retention theory can maximize interactions with students in and out of the classroom. Zhao and Kuh (2004) and Reason, Terenzini, and Domingo (2006) implored colleges and universities to develop opportunities for student-to-faculty engagements through first-year experience programs, service-learning opportunities, living-learning communities, and first-year seminars. Umbach and Wawrzynski (2005) explained that students report higher levels of institutional engagement when they have interactions with "faculty who use active and collaborative learning techniques, engage students in academic-related experiences, emphasize advanced cognitive activities in the classroom, interact with students outside of the classroom, challenge students academically, and value enriching educational experiences" (p. 153). Providing opportunities for students to foster relationships with faculty is a positive way for institutions to impact to student persistence and bolster student sense of belonging.

Campuses can also benefit from being intentional with their efforts towards at-risk populations through student-to-faculty interaction. Precisely, institutions can reach students from at-risk populations such as lower ability students, first-generation students, and students from

low socioeconomic backgrounds by encouraging interactions with faculty (Cruce, Wolniak, Seifer, & Pascarella, 2006). Providing these at-risk populations with faculty interaction experiences can help institutions prevent student attrition exactly where it is needed most. Williams-Chehmani (2009) noted that without intentional interactions with faculty to spur motivational attitudes about major areas of study and the institution, students from at-risk population groups may never feel connected. Campuses face the challenge of developing ways to connect these student populations to faculty to support student persistence and success (Cano & Castillo, 2007; Ewers, 2007; McCormick, Kinzie, & Gonyea, 2013).

Student interactions with peers and faculty have a significant impact on knowledge acquisition, social and academic involvement, and overall satisfaction (Reason, Terenzini, & Domingo, 2006). Achieving what Tinto (1993) deemed "academic and social integration" requires that experiences occur and relationships be formed on the student-to-student and student-to-faculty level (Barefoot, 2000). If designed and implemented with intentionality and deliberate goals in mind, student interaction experiences in the initial stages of enrollment and throughout the first years of college provides the appropriate force to propel students towards academic success and degree completion (Krause, 2005). Finding the best experiences for each institutional culture and environment is the responsibility of campus administrators. Radloff and Coates (2013) suggested that although the time and effort students devote to engagement are critical, institutions should work diligently to find effective ways to monitor students' engagement patterns to maximize campus initiatives. Missing the mark for student-to-student and student-to-faculty connections could prove detrimental to institutional student persistence rates.

Student Support Services

For a campus to support and encourage student development appropriately, an amalgamation of efforts, from the entire campus is required. The adage "it takes a village" comes to mind when looking at the literature on supporting student success. A commitment to student success means supporting students in multiple ways across cognitive, social, and physical domains, with this support leading to increased student performance and satisfaction (Pascarella & Terenzini, 2005). Research on patterns of student utilization of campus support resources is extensive, yet leaves as many questions as it provides answers. Constants focus on female students being more likely to seek and use academic support services on college campuses than males and the existing differences among demographic, socioeconomic, and other student characteristics in terms of resource utilization (Abrams & Jernigan, 1984; Alarcon & Edwards, 2013; Torres, Jones, & Renn, 2009). Students who visit campus resources appear to be better equipped at succeeding academically and are more apt to persist.

In addition to promoting student-to-student engagement, mentoring programs provide support to students. Mentoring can take the form of peer mentoring or faculty and other campus professional mentoring. Campbell and Campbell (2007) purported students involved in mentoring have higher GPAs, complete more courses and credit hours, and exhibit higher retention rates than students not in mentoring relationships. Male students typically assert less effort and are less inclined to seek mentoring resources, while female students find mentoring more rewarding and seek out mentoring situations (Kinzie, Gonyea, Kuh, Umbach, Blaich, & Korkmaz, 2007). Furthermore, Ficano (2012) found that mentoring situations where mentees are of the same gender as their mentor increases academic success and development outcomes. Mentoring also affords students the chance to learn and experience from individuals who may be

different from them. Students who interact with diverse peers and professionals engage more in deep learning activities, perceive campus environments to be more supportive, and report more positive interactions with other students (Grasgreen, 2013). Peer and professional mentoring relationships impact student persistence.

Academic resources such as tutoring also provide support to college students. Laskey and Hetzel (2011) reported that academic support services have a positive effect on at-risk students and that services such as tutoring also have a positive impact on the GPA of all students who seek the resource. Studies suggest that participation in tutoring is associated with higher GPAs and course completion, and students who receive peer tutoring have higher GPAs and are retained and graduate at higher rates than students who do not receive peer mentoring (Boylan, Bliss, & Bonham, 1997; Bourdon & Carducci, 2002; Braxton, Hirschy, & McClendon, 2011).

According to Levitz and Noel (1990), "studies have shown that freshmen who can name a campus-affiliated person they can turn to with a problem are more than twice as likely to return for the sophomore year as those who cannot" (p. 10). Aside from a faculty member, an academic advisor is the first line of support on campus for many students. The National Association for Academic Advising (NACADA) (2006) explained that " academic advising, based in the teaching and learning mission of higher education, is a series of intentional interactions with a curriculum, a pedagogy, and a set of student learning outcomes". Light (2001) posited that "good advising may be the single most underestimated characteristic of a successful college experience" (p. 81). Research demonstrates that when students partake of advising services, they feel better about their advisors as well as the institution as a whole (Nadler & Nadler, 1999; Peterson, Wagner, & Lamb, 2001). In short, academic advisors provide structure to the academic progress students experience while in college.

Metzner's (1989) study revealed that high-quality advising had a statistically significant positive effect on persistence as because of advising's positive impact on grades and satisfaction. Concise empirical evidence about the relationship between academic advising and student retention is relatively mixed; however, student perception is more traceable (Pascarella & Terenzini, 1991). The National Student Satisfaction and Priorities Report details results from nearly 816,000 students at 1,098 institutions from their responses to the Student Satisfaction Inventory™ (SSI). Overall, students rate academic advising as a strength and place it as a priority in their college experience (Noel-Levitz, 2013). Drake (2011) explained that an interaction with an advisor could be the difference between a frustrated dropout and a graduate with honors.

Intrusive academic advising, which involves some combination of recommended or required advising sessions for students on a regular basis and predetermined goals of increasing motivation, academic success, and reducing attrition, has emerged as one of the most effective tools to help and ultimately to retain students (Schwebel, Walburn, Jacobsen, Jerrolds, & Klyce, 2008). Teasley and Buchanan (2013) reported that students involved in such advising scenarios report increased willingness to seek resources, feel academically supported, and are more satisfied with their educational experiences. Kuh (2008) noted that the quality of advising is among the most powerful predictors of campus satisfaction for students. If students are happy with their advising experiences, they typically find campus to be more favorable and feel that they belong. Intrusive academic advising encourages the linkages students need to form a relationship with a campus figure outside the classroom and provides students with tangible, real-time, academic progress information.

The importance of academic advising and its popularity as a persistence tool is well documented. Although a mixture of advising structures exists, professional models are the most recommended form (Kuh, 2006). The NSSE (2013) reported that only 40% of students identified an academic advisor as their primary source of advice regarding academic information; however, of those students who met with an advisor more than two times a year, nearly 75% reported greater satisfaction with institutional services and support. Additionally, the staggering point of the recent engagement survey results is that one in 10 students never meet with an advisor to discuss their academic progress or course schedule. Grasgreen (2013) noted that this could imply that students either do not value advising, feel they are not getting what they need, or possibly think they do not need the support. Regardless of the reason, with the evidence supporting academic advising as a key component to student retention and graduation, students missing out on those interactions are at risk for leaving college and not completing their degree. De Sousa (2005) succinctly stated that "academic advisers can play an integral role in promoting student success by assisting students in ways that encourage them to engage in the right kinds of activities, inside and outside the classroom" (p. 1).

Although faculty and advisors traditionally provide much of the institutional relationships students experience, Coates, James, and Baldwin (2005) suggested that it is also important for campus support services to create an environment of accessibility. As Bowman (2010) explained, college students typically lack the capability, motivation, and wherewithal to be premeditated with their utilization of campus resources. Most students are more reactive when faced with the need to receive assistance than proactive at the onset of an academic semester (Astin, 1987; Bean, 1990; Friedlander, Pace, & Lehman, 1990; Kuh, Kinzie, Buckley, Bridges, & Hayek, 2007; Tinto, 1993). An overarching concern for college students is the need for timely and

ongoing feedback from faculty and advisors concerning their progress toward their goals (Noel-Levitz, 2013).

Many explanations exist in research literature about why students don't seek or utilize support services. Students are individuals, so although common themes on the lack of resource consumption have been reported, universal reasons can only be generalized (Abrams & Jernigan, 1984). Additionally, many students do not seek help out of embarrassment, insecurity, or feelings of pride (Kuh, Cruce, Shoup, & Kinzie, 2008). Alarcon and Edwards (2013) noted that variables of gender, standardized test scores, and level of conscientiousness are significant predictors of student support service utilization and retention.

Overall, results of the most recent NSSE (2013) survey suggested that college students find their campus environments to be supportive to their overall academic and social wellbeing but students don't always follow through. Campuses should try to convey that engaging students isn't just the responsibility of the faculty, or of one or two offices or programs, but that the entire campus must play an active role in promoting student interaction and effective learning practices (Grasgreen, 2013). Providing the feeling that the campus is a supporting enterprise is needed early in a student's matriculation to remove ideas that support systems are a hassle to use. Morrow and Ackermann (2012) supported the findings of Astin (1987) and Tinto (1993) that students feeling a sense of belonging is correlated with persistence and added the fact that a sense of belonging also impacts student decision to seek and use resources on campus. Institutions can help their retention rates and decrease attrition by installing supportive resources that assist students with academic outcomes, but also work to assimilate the student into the campus environment.

Student Persistence Today

According to The National Center for Higher Education Management Systems and the National Information Center for Higher Education Policymaking and Analysis (2013), for the 2010 student cohort, the national average of first-time full-time college freshmen returning their second year on four-year campuses is 77.1%. That leaves 22.9% of the undergraduate student population in the United States at risk for making it to their sophomore year. However, differences do exist between public and private institutions. Public colleges and universities retain students at a rate of 78.4%, while private schools have only 74.8% of first-time college freshmen matriculate for their second year (National Information Center for Higher Education Policymaking and Analysis, 2013). Following many of those students through their college careers reveals that many do not actually finish their degree within a six-year graduation timeframe. It is reported that only 55.5% of students in the United States will finish their degree within the six-year window (National Information Center for Higher Education Policymaking and Analysis, 2013). With nearly half the students enrolling in colleges and universities not reaching degree completion within six years and tuition and fees increasing exponentially, higher education faces great accountability and student retention challenges (Moxley, Najor-Durack, & Dumbrigue, 2013).

Retention and graduation are significant issues for colleges and universities, both internally in the form of recruitment and retention of majors and externally through the recruitment and retention to the overall institution (Porter & Swing, 2006). Today's higher education administrators across the nation are more aware and concerned about student attrition and how to retain students more effectively and ultimately to graduate them. The work of many theorists and practitioners has paved the way for current best practices in student retention and

graduation institutional structures. The American Association of State Colleges and Universities (AASCU), the National Association of System Heads (NASH) and the Education Trust identified retention and graduation as critical issues facing higher education, since both measures are considered to be measures of institutional effectiveness (AASCU Report, 2005).

Noting the importance of retention and graduation information in today's higher education landscape, The Education Trust makes institutional retention and graduation information accessible via www.CollegeResults.org, where rates from four-year institutions may be compared with peer institutions (Carey, 2005). Schnell and Doetkott (2002-2003), Amey (2006), and Kuh (2013) linked retention and graduation rates to public viewpoint of institutional image, citing that reports of such rates can impact perceptions of the institution's effectiveness, quality, and commitment to students. The demand for accountability in higher education has even contributed to the idea that high attrition rates indicate institutional failure to potential consumers, governmental agencies, and watchdog interests (DesJardins, Ahlburg, & McCall, 1999). Conversely, institutions celebrating high persistence rates can attract higher-performing prospective students (Morisano, Hirsh, Peterson, Pihl, & Shore, 2010). The availability of these reports provides more substance for students and parents, or consumers, to make more informed decisions when selecting a college or university.

The importance of retention as a critical issue is beyond debate in contemporary higher education. Given the array of federal, state, and private syndicates requesting institutions and consolidated school systems report retention and gradation data, it can be said that the issue is one of the most important facing colleges and universities. Furthermore, retention and graduation data are being used as indicators of academic quality, student success, and effectiveness in multiple college rankings formulas, including the United States News and World Report

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(Dingman, Madison, & Madison, 2011; Trowler, 2010; Wyrick, 2014). In fact, many public institutions receive funding based on enrollment, retention, and graduation rates, meaning that if dips occur, funding could suffer (Morisano, Hirsh, Peterson, Pihl, & Shore, 2010). The importance of transparency in reporting retention and graduation data impacts enrollment management and institutional research practices nationwide (Monks & Ehrenberg, 1999; Nelson-Laird, Shoup, & Kuh, 2006; Kuh, Kinzie, Schuh, Whitt, & Associates, 2010). Conducting institutional research and assessment on complicated issues such as retention and graduation provides unique challenges to colleges and universities.

Retention today is incredibly important. Wyrick (2014) noted that the words student retention, graduation, persistence, and attrition are used daily on college campuses in higher education. The topic comprises the majority of subject matter discussed at most higher education conferences, in research literature, and discussion of improving institutional effectiveness and brand. Tinto (2006) clarified "it would not be an understatement to say that student retention has become a big business for researchers, educators, and entrepreneurs alike" (p. 2). Campuses are working to discover innovative ways to retain students and searching for an edge in the retention efforts. Retaining students not only improves public perception of institutions, but can solidify funding sources through appropriations and tuition dollars as well. The use of innovative approaches to monitor student performance as a means to retention has been consistently gaining momentum in recent years.

Student Persistence in the University of North Carolina System

As a result of national attention, retention and graduation rates have been identified as vital by the General Administration of the UNC System (UNC-GA). As such, leaders have set goals for the constituent institutions within the system. The UNC system utilizes definitions and

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guidelines for retention and graduation from the United States Department of Education's Integrated Postsecondary Education Data System (IPEDS). When compared to the 2012-2013 national retention average of 65.8%, according to ACT, the UNC System aims to be above that average on each of the 16 constituent campuses (UNC Report on Retention and Graduation, 2014). The fall 2013 totals for the UNC system were up 0.7 annual percentage points to reach 83.3% freshman-to-sophomore retention rate. Additionally, the four-year and six-year rates also increased and surpassed the national averages. For four-year graduates, the 39.6% 2012-2013 IPEDS graduation rate was up 0.8 annual percentage points and the six-year rate moved to a 1.0 annual percentage point increase. Retention rates for other UNC System schools for the 2012-2013 FTFT cohort are seen in Table 1.

The Fostering Undergraduate Student Success (FUSS), 400.1.5[R], regulation, a recent amendment to the UNC Policy Manuel approved by the BOG on January 11, 2013 and related to student success, directs constituent institutions to:

1. Set academic progress and degree attainment as primary outcomes,

2. Promote academic quality, rigor, and integrity, and

3. Make possible "seamless" educational opportunities across the UNC campuses within the North Carolina Community College (NCCC) system, and early college high schools.

The adoption of these efforts place retention, graduation, and time to degree completion as important focal points for each campus. Individual institutions have the ability to develop and implement strategies to approach these system-wide points of focus; however, UNC-GA suggests that each constituent campus:

Table 1

Retention Rates for Other University of North Carolina System Institutions: First Time Full Time Cohort 2012-2013

Institution	Retention Rate (%)
Appalachian State University	87.2
Elizabeth City State University	72.5
Fayetteville State University	69.2
North Carolina Agricultural and Technical State University	76.3
North Carolina Central University	73.2
North Carolina School of the Arts	84.2
North Carolina State University	92.6
University of North Carolina at Ashville	78.6
University of North Carolina at Chapel Hill	96.0
University of North Carolina at Charlotte	80.4
University of North Carolina at Greensboro	72.2
University of North Carolina at Pembroke	67.6
University of North Carolina at Wilmington	85.2
Western Carolina University	78.6
Winston Salem State University	75.0

Note. University of North Carolina General Administration.

1. Set credit hour limits for four-year baccalaureate degree programs

2. Develop academic policies within regulations established by UNC-GA on:

   a. Satisfactory Academic Progress (SAP)

   b. Course Adjustment Periods ("Drop/Add")

   c. Course Withdrawal

   d. Grade Exclusion or Replacement

   e. Minimum, Maximum, and Average Course Load

3. Establish a student success and support structure to review and to issue regular reports on:

   a. Retention, academic progression, graduation, and time to degree

   b. Course scheduling as it relates to whether courses required for graduation are offered on a timely basis and with an adequate number of sections and seats

   c. Course offerings and grade requirements to assess if any undue additions to general education requirements exist or if such requirements unintentionally lengthen time to graduation

   d. The academic advisement system to ensure students receive appropriate assistance in proceeding toward graduation in a timely manner.

4. Campuses will be compliant with Title IV regulations that define student eligibility for and receipt of federal financial aid

5. Campuses will be compliant with the Comprehensive Articulation Agreement with the NCCCS and are encouraged to develop policies that promote seamless transfer   among schools in the University of North Carolina system.

These policies are progressive in nature and are intended to ensure that institutional and system-wide policies and practices facilitate behaviors that support student success, retention, and timely graduation. The institutional strategies and implementation structures of these policies are undoubtedly diverse, as constituent campuses possess drastically different student populations, enrollments, and academic rules and regulations. Affording each campus the freedom to meet system mandates and policies protects institutional culture, accentuating commitments to accountability while protecting autonomy (Alexander, 2000).

Student Persistence at East Carolina University

A large, public, state-supported institution located in a lower tiered economic area of North Carolina, ECU seeks to provide opportunity to students and service to the region (ECU Tomorrow, 2007). Carey (2005) approached the issue of large colleges and universities and their struggle to provide connective experiences in order to retain students effectively, citing size and complexity as attrition factors. Due to ECU's promise to do so through its mission, the campus faces many challenges to retain and graduate students. Two of the five growth opportunities ECU has developed for its Second Century campaign, Assuring Access and Supporting Student Success, directly impact retention and graduation efforts. In fact, the two forces can be contradictory and one can attack the progress of the other, as there is a constant tension between retention and access goals (McBee, Shaunessy, & Matthews, 2010). Supporting student success is part of the overall institutional commitment to provide a great education and preparation through engagement, community service, and meaningful leadership experiences (ECU Tomorrow, 2007). Support services and programmatic opportunities are engrained throughout the institution to promote the whole student in line with student development and engagement theoretical foundations (Tinto, 2005). The campus's commitment to providing accessibility to

education creates precarious enrollment management situations by attracting students who may not meet predictive success models through the admissions process (J. Geissler, personal communication, 2013).

Campbell (2006) noted that "ECU, despite drawing heavily from a rural eastern North Carolina population that includes sizeable numbers of first generation college students, has managed to hold its own…when compared with peer institutions within the state and nationally" (p. 1). The focus on retention efforts for freshman students highlights much of the efforts the campus uses to prevent student attrition. As Pascarella and Terenzini (2005) explained, engagement and involvement opportunities that support student bonds and linkages to the institutional are most effective during the first year. Noting the power and influence of first-year programming on student persistence, ECU structures many freshman experiences in harmony with the John N. Gardner Institute for Excellence in Undergraduate Education, formerly the Policy Center on the First Year of College (K. Smith, personal communication, 2014). Formalized first-year experiences are handled through the Office of Student Transitions; however, it is very difficult to label efforts as retention or non-retention, because individual students identify with a wide array of experiences that connect them to campus (Alexander & Gardner, 2009).

Although the entire campus is ultimately responsible for supporting and guiding student persistence (Kuh, Kinzie, Schuh, Whitt, & Associates, 2005, 2010; Miller, Pope, & Steinmann, 2005; Seidman, 2005), the need for a resident administrator to monitor student persistence is a reality for many institutions. Appropriately, ECU employs an Executive Director of Retention Programs and Undergraduate Studies, who is charged with coordinating collaboration across campus to bolster student persistence.

ACT reports in the *What Works in Student Retention* 2010 study that students indicate that initiatives that support academic and social integration are more effective and impact their motivation to succeed and stay in school. Academic advising, first-year programming including freshman seminars and learning communities, and learning support such as tutoring and supplemental instruction were rated by students as having the greatest impact on their retention (ACT, 2004, 2010). Cornerstones of ECU's efforts, the aforementioned retention initiatives are in line with Kuh's (2008) high-impact educational practices. Specifically, Kuh (2009) explained that students who engage in at least two of these high-impact activities, one in the first year and one in a subsequent year, are more likely to persist than those students who do not. ECU's retention efforts seek to incorporate best practices from national leaders in research related to each respective field (J. Geissler, personal communication, 2014). Existing research on student persistence provides sound structure and backing to ECU attempts to bolster student success, improve student retention and graduation rates, and reduce student attrition.

A reality for ECU is the presence of many students who are not well versed in how to be a college student and are not academically prepared, since many students come from low socioeconomic areas, are first generation college students, and are labeled as at risk from the onset of their enrollment (Campbell, 2006). Conversely, many students enter well prepared and are high performing students who will pursue academically rigorous programs. As such, the institution must be in tune with the various student populations and their student support needs. Pike (2013) and Crosling, Thomas, and Heagney (2008) clarified that institutional methods to improve student persistence and academic success must give careful consideration to individual student needs and to institutional culture to provide appropriate and effective programmatic structure and resources. Blending national best practices from respective topical areas such as

national associations governing academic advising, tutoring and supplemental instruction, first-year experiences, curriculum and instruction, etc. allows ECU to meet students where they are, in a language that works best for them (J. Geissler, personal communication, 2014). There are no cure-all efforts that can solve the retention problem for all students, therefore institutional adaptability is paramount when developing and implementing retention programs (Caison, 2007; Davidson, Beck, & Milligan, 2009; Hobsons, 2010; Tinto, 2006).

Nationally, 77.7% of undergraduate students at four-year public institutions that grant doctoral degrees, like ECU, are retained from the first to second year and 48.9% complete their degree within a five-year period (ACT, 2013). In comparison, ECU retained 80.9% of the 2012-2013 student FTFT cohort and graduated 32.4% of students within four years and 56.3 within six years (see Appendix A). ECU ranks sixth in first to second year retention and six-year graduation and ranks eighth in four year graduation compared to the other 15 UNC system campuses. As the third largest institution in the UNC system and given ECU's recruiting and service area concentration, including a large number of transfer students, the institutional student persistence efforts seem to be effective.

Nationally, many students are not retained due to academic performance issues (McGrath & Burd, 2013). Referred to as involuntary departure (Tinto, 1975), academic difficulty can provide quite a barrier to students for a variety of reasons. At ECU, students who earn less than a 2.0 cumulative GPA are placed in academic difficulty. Stages of such difficulty consist of academic warning, academic probation, and academic suspension. Students are allowed one probationary semester before academic suspension is enforced. Students who do not meet their retention GPA as outlined in ECU's undergraduate catalog, are placed on probation. At the culmination of the probationary semester, a student who has not met the retention GPA, is not

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permitted to attend and must serve a suspension prior to reapplying to the university. At the conclusion of the spring 2013 semester, 6.7% of the undergraduate population was in academic difficulty, while 8.7% experienced academic difficulty at the end of the fall 2013 semester. The spring semester enrollment was 19,683; however, a large freshman class, exceeding fall 2012 by 480 students, moved the fall 2013 undergraduate enrollment to 20,618. Attending to students who are in academic difficulty is very important. Swecker, Fifolt, and Searby (2013) explained that failure to provide adequate strategies to help students recover from academic difficulty poses a great threat to student persistence.

To diagnose appropriately the issues that threaten student persistence, administrators must evaluate rates of attrition through multiple lenses (Ishitani, 2006). For instance, at ECU, female students are retained and graduate at a higher rate than males. The gap between males and female retention and graduation appears to be widening according to recent institutional data. However, based on a study of the fall 2012 FTFT freshmen cohort, early alert systems and tutoring participation may positively impact retention (J. Geissler, personal communication, 2014). Specifically, a gap exists between white females and males (see Table 2).

Freshmen in the 2012 FTFT cohort who did not return for their second year of college vary according to gender. For non-returning males, almost 70% had a GPA under 2.0, which falls under ECU retention standards to continue enrollment. For females, more than 70% had GPAs over 3.0 (see Figure 1).

This indicates that the reason for leaving ECU may vary according to gender and that males tend to persist at ECU if they are in good academic standing, having a GPA of 2.0 or higher. The involuntary departure has a definite negative correlation to male attrition, while the higher performing females tend to leave the institution versus face suspension.

Table 2

Gap in Retention Rates Among White Students based on Gender of First Time Full Time

Freshman Cohorts at East Carolina University: 2005-2012

Retained to Second Year	Cohort*							
	FTFT 2005	FTFT 2006	FTFT 2007	FTFT 2008	FTFT 2009	FTFT 2010	FTFT 2011	FTFT 2012
White Females	79.6	77.9	77.3	80.8	81.9	83.7	82.2	83.9
White Males	77.4	75.2	74.3	76.3	80.5	77.4	71.0	76.4
Female/Male Gap	2.2	2.7	3.0	4.5	1.4	6.3	11.2	7.5

Note. *Indicates numbers are percentages. Source: East Carolina University Institutional Planning, Assessment, and Research.
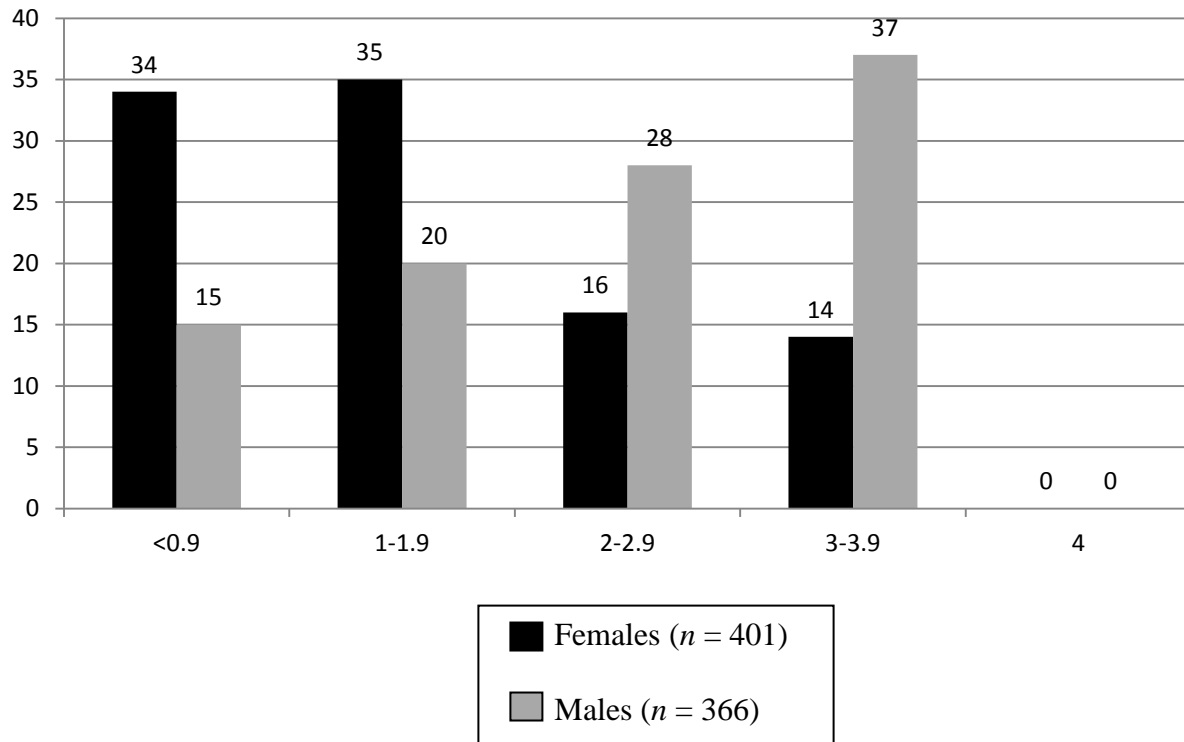
Figure 1. East Carolina University first time full time freshmen not retained to fall 2013: 2012

cohort.

In regards to differences in retention rates at ECU base on gender and ethnicity, male retention, regardless of race, is significantly lower than that of females. Specifically, black and white females hold a large gap between both black and white males (see Figure 2).

Interestingly, when compared to average 1-year retention rate totals from the 2008-2012 cohorts, trends shift. In terms of returning for their sophomore year, black males and females lead the way when compared to their white counterparts. Examining the 6-year graduation rates uncovers that although black males and females are retained at higher rates, white males and females complete their college degrees at higher rates from the 2002-2007 cohorts (see Figure 3).

Freshmen returning to their home institution for their second semester, typically the spring semester, is one of the most reliable predictors of retention (Kuh, 2007; Reason, 2009; Tinto, 2003). Commonly, when freshman students return to the spring semester at high rates, retention rises (Cruce, Wolniak, Seifert, & Pascarella, 2006). This concept is illustrated by tracking the lowest retained fall to fall cohorts, 2004 and 2007, which also had the lowest returning fall-spring numbers (see Table 3). Likewise, the highest retained cohorts, 2009 and 2010, had the highest percentage of students returning fall to spring. Furthermore, the 2010 FTFT cohort had the lowest number of students, 4.5%, leave ECU than in previous years (see Table 3). Using data from the 2003-2009 FTFT cohorts, the predicted retention rate was estimated to be 81.3% with a predicted range of 80.1% to 82.4%. Upon verification from UNC-GA, ECU's retention rate for the 2010 cohort was finalized at 82%.

Using similar logic and modeling, a predicted retention rate and range was calculated for the 2011 FTFT cohort. There were 230, 5.9%, students from this cohort who did not return for the spring 2012 semester. Applying the trend that an additional 14.2% average over 8 years leaves ECU after spring or summer semesters in 2012, 79.9% retention was projected. Upon
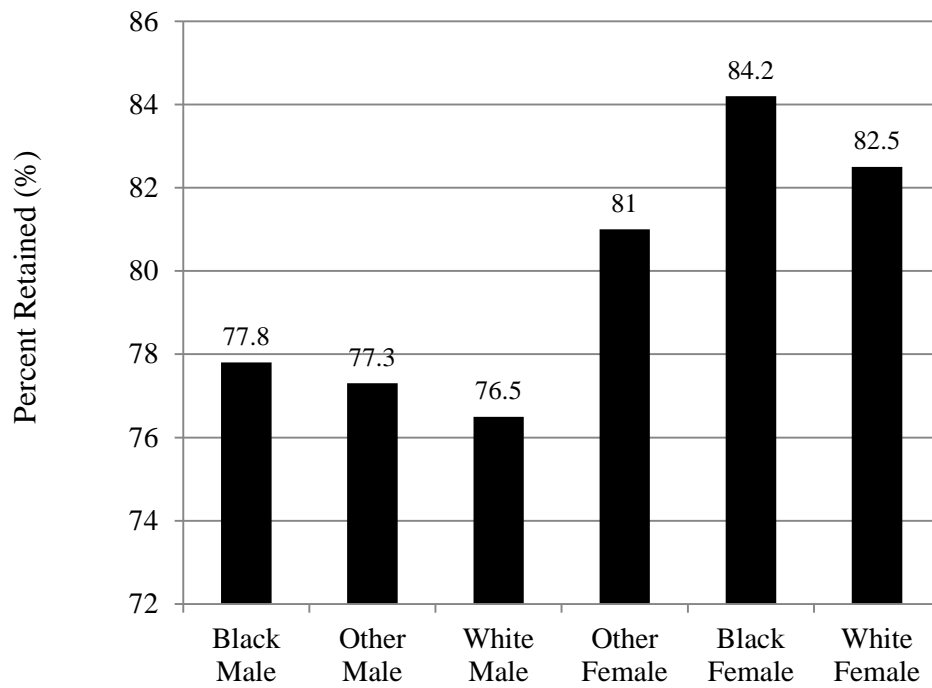
Figure 2. Average 1-year retention rate at East Carolina University by gender and ethnicity

for first time full time freshmen cohorts: 2008-2012.
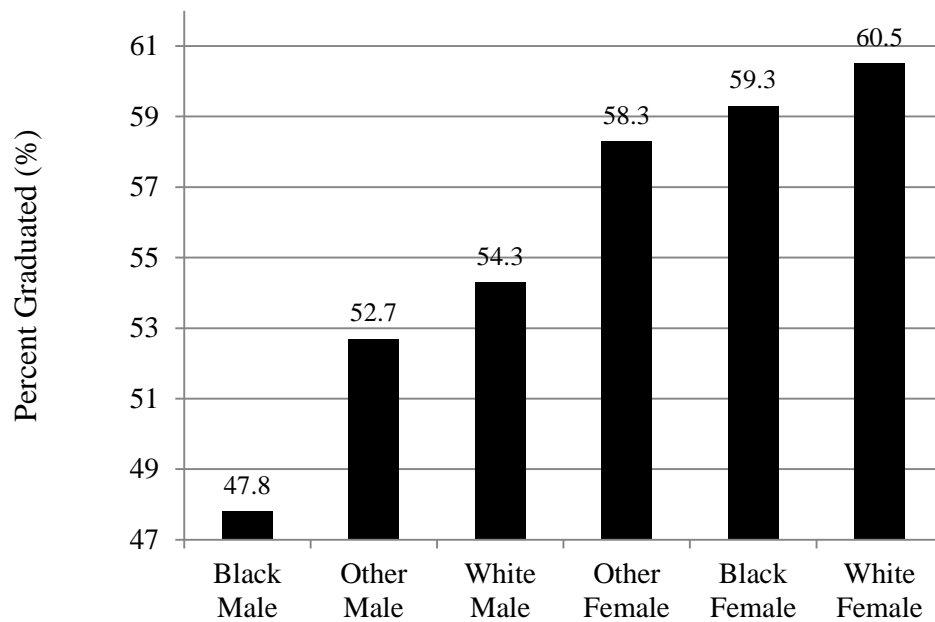
Figure 3. Average 6-year graduation rate for East Carolina University FTFT freshmen

cohorts by gender and ethnicity: 2002-2007.

Table 3

Trends in Fall to Spring Return and Fall to Fall Retention at East Carolina University:

2003-2011 Cohorts

Cohort Year	Cohort Sample	One-Year Retention Rate (Non-Persistence)*	Non-Return Fall-Spring*	One-Year Non-Persistence Minus Non-Return Fall-Spring*
2003	3460	78.8 (21.2)	7.7	13.5
2004	3456	75.9 (24.1)	9.1	15.0
2005	3223	78.7 (21.3)	7.6	13.7
2006	3792	77.3 (22.7)	8.3	14.4
2007	4196	75.9 (24.1)	8.7	15.4
2008	4522	78.8 (21.2)	6.9	14.3
2009	3947	81.2 (18.8)	5.7	13.1
2010	4201	81.3 (18.7) predicted 81.3 actual pending GA verification	4.5	14.2
2003-2010 Average			7.3	14.2
2011	3891	Predicted 79.9 (20.1)	5.9	5.9 + 14.2 (2003-2010) = 20.1 (79.9 retention) Range = 78.7-81.0

Note. *Indicates numbers are percentages. Source: East Carolina University Academic Advising and Support Center.

vetting from UNC-GA, the retention rate was determined to be 82.5% for the 2012 FTFT cohort. The number of students returning to their second semester does provide the ability to anticipate and project retention rates for the following year. Understanding these institutional enrollment trends, ECU places additional advising presence in the spring semester to support students who may be attrition-prone (J. Geissler, personal communication, 2013).

Morrow and Ackerman (2012) found that students who perceived their home institution as embracing their academic future and offering support services increases motivation to seek resources and persist. Although a gap exists in retention rates at ECU when comparing students by gender and ethnicity, the gap is virtually non-existent for students who attend student support services such as tutoring (see Figure 2).

Like most institutions, differences exist in students and deciphering what strategies work for one student population and do not work for another is extremely challenging. Student persistence data, specifically monitoring retention, graduation, and attrition, is a high attention priority for ECU. In accordance with institutional mission and values in the face of national, state, and local accountability scrutiny; and in response to mandates and funding-related persistence goals set by the UNC system, retaining and graduating students is imperative for survival. Accordingly, ECU has turned to an early intervention model to connect students with campus resources to monitor academic success, retention, resource utilization; and to provide opportunities to students that reinforce the idea that they are important to the institution and that they belong.

<h3 style="text-align:center">Early Intervention in Higher Education</h3>

In the current landscape of higher education accountability, retention and graduation rates are hot-button topics, representing one of the most important issues facing higher education

(Simons, 2011). Colleges and universities face potential decreases in funding if retention and graduation goals are not met (Cook & Pullaro, 2010). As campuses across the nation work diligently to find innovative ways to keep students enrolled, systems that monitor student academic performance have burst onto the scene. Specifically, early warning or alert system usage is increasing steadily to bridge the gap between students, faculty, and campus resources. As such, early alert systems address student development, engagement, and persistence theory cornerstones by providing students with a sense that someone is concerned with their academic success (Bradley & Blanco, 2010; Swail, 2004).

Seidman (2005) explained early intervention in higher education as initiating intervention at the earliest possible point following awareness of a student problem. Intervening earlier can provide opportunities for development and growth within an educational context. Considered a process to address academic and social issues, early intervention may provide effective opportunities for those students who would not reach out on their own (Varney, 2008). Reaching students not engaged or comfortable enough to find support on their own is imperative in an educational climate focused on student success and performance-based funding models that focus on retention and graduation rates as justification for appropriations (Amey, 2006; Carey, 2007). Leaving even one student behind can prove to be detrimental in the high-stakes, numbers-based accountability environment.

Early intervention and alert programming is concerned with improving student retention and graduation through student support and engagement and with providing connections between students and numerous campus resources. Findings by researchers in student retention have led to a clearer picture of why students do not persist; however, the literature on collegiate retention is very vast. The empirical research on student retention is considered Herculean, abundant, and

widespread, but typically leads to ambiguous outcomes, lacking universal institutional

applicability (Reason, 2009). For this reason, early intervention strategies have traditionally

worked to bridge the gap between a wide variety of campus resources and existing approaches to

solving the student persistence problem.

Acclaimed scholars in higher education urge institutions to develop early intervention

models to install early alert systems to combat student attrition and low academic performance,

and to promote student success and engagement (Bradley & Blanco, 2010; Kuh, 2007; Siedman,

2005; Tinto, 2008). Gittleman, Joseph, and Zhang (2012) explained that focusing efforts on

academically at-risk students has a direct impact on overall persistence and completion rates,

specifically related to implementing outreach proactively. Intervention strategies vary across

higher education by institution but the importance of the action is undeniable. Rienks and Taylor

(2009) noted that such intervention is increasingly more valuable the earlier it occurs.

Early Alert Systems

The meaning and nature of early alert systems takes many different forms in higher

education. Generally, early alert refers to a formal, intentional process of identifying the at risk

students to monitor or a process for monitoring students during academic coursework (Cuseo,

2004). Furthermore, Lynch-Holmes, Troy and Ramos (2012) posited:

> Early alert and intervention is a systematic program or initiative within higher education
>
> designed to identify and support students at risk of attrition in order to improve student
>
> success, retention and persistence. Early alert and intervention is comprised of two key
>
> components: Alerts: A formal, proactive feedback system though which student-support
>
> agents are alerted to "red flags" regarding student success as early as possible.

Intervention: A strategic method of outreach to positively respond to red flags or alerts in

order to provide intrusive and individualized interventions to students in need. (p. 2)

The goal of such systems is to identify and intervene in order to prevent student attrition and

promote student academic success. Singell and Waddell (2010) explained that early alert systems

represent an institutional commitment, being intentional, deliberate, and formal in the process of

combatting common persistence challenges facing students. The foundation of the process

involves faculty notifying students and a professional support professional in order for

intervention to occur as early as possible to stop the at-risk behavior (Donnelly, 2010; Lynch,

2007; Wasley, 2007). Regardless of institutional interpretation, the aforementioned working

definition and goal-structure provides the basic groundwork of all early alert systems.

Cuseo (2004, 2006) noted that poor academic performance during an academic semester

is a good indicator that students are in jeopardy. Early alert and intervention identifies students

that have problems meeting institutional expectations and standards and works to present them

with resources to provide an opportunity for improvement (Kuh, Kinzie, Schuh, & Whitt, 2005).

As such, institutions use early alert and intervention systems to extend a modern *in loco parentis*

construct with students (Lee, Contreras, McGuire, Flores-Ragade, Rawls, Edwards, & Menson,

2011). Yeager and Walton (2011) pointed out that by understanding interventions as a powerful

persistence tool, administrators can detect such academic performance issues and provide

appropriate mechanism to provide timely support for students.

The use of retention initiatives has become a much celebrated practice on college

campuses (Seidman 2005; Tinto, 2008). Bradley and Blanco (2010) suggested that early alert or

early warning programs are one of the best contemporary strategies employed by institutions to

approach the retention problem. Lynch-Holmes, Troy, and Ramos (2012) reported that early alert

and intervention approaches to improving student success, retention, and persistence are at the height of popularity. Simons (2011) explained that the growing interest in early alert programs is due to the invasive nature of the outreach within the design. The intrusive nature of early alert and invention incorporates the foundational tenants of intrusive academic advising, considered the most effective form of advising (Hughey, 2011; Kirk-Kuwaye & Nishida, 2001; Vander Schee, 2007). The proactivity of the early alert outreach and referral processes allows institutions to aim efforts at students who may lack an established sense of identity or belonging.

Within the context of early alert and intervention, the most noted factors associated with success or struggle for college students are academic performance and goal development, academic skills, and assimilation to the institution (ACT, 2004; 2010). In more tangible forms, Cuseo (2007) explained that such attributes include student behaviors such as absences or tardiness, missed assignments, midterm grade performance, or lack of concrete academic goals. Studies suggest that there is a negative correlation between classroom attendance and grade performance, perpetuating the idea that students who are not engaged are attrition risks (Cuseo, 2006; Kuh, Kinzie, Schuh, Whitt, & Associates, 2005; Richie & Hargrove, 2005; Tinto, 1993). Follow-up studies found that simple intervention strategies such as phone calls, postcards, and face-to-face conversations with struggling students provided the necessary support to improve student involvement and engagement (Cuseo, 2004; Coley & Coley, 2010; Schuman, Olson, & Ethridge, 1985; Tinto, 1993). Lynch-Holmes, Troy, and Ramos (2012) credited these findings as the cornerstone of early alert literature.

Early alert systems and intervention models are not the same. There are currently a variety of professional systems on the market and many institutions have opted for a "home-grown" system to meet their needs more efficiently (Wasley, 2007). The goal of an alert system

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is to identify students exhibiting "at-risk" behavior and refer them to campus resources in order to get them back on track (Kuh, Kinzie, Schuh, & Whitt, 2005). Swail (2004) clarified that effective early alert systems should include integration of student support services, data collection, assessment, and institutional communication networks. Levitz and Noel (2000) noted that early identification, intervention and good academic advising were direct keys to retention. By 2001, nearly 60% of American colleges and universities adopted some form of early alert and intervention strategies to improve retention and graduation (Barefoot, 2001; Harvey, Drew, & Smith, 2006). Although popular, widely-accepted as effective, and ever-increasing in implementation frequency, such systems are relatively new, and Lynch-Holmes, Troy, and Ramos (2012) warn that there are few definitive best practices for their implementation and development.

Services provided through early alert systems are evidence of institutions adopting innovative ways to transition students from high school to college successfully. In combination with intervention strategies, early alert systems help students improve performance in their courses (Beatty-Guenter, 1994; Legg, Legg, & Greenbower, 2001; Lewis & Lewis, 2007; Perez, 1998; Wagner, Sasser, & DiBiase, 2002). Fuchs and Fuchs (2002, 2006) found that "when instructors use systematic progress monitoring to track their students' progress…they are better able to identify students in need of additional or different forms of instruction, they design stronger instructional programs, and their students achieve better" (p. 1). Furthermore, Safer and Fleischman (2005) added that when instructors monitor student progress, students learn more, instructor decision-making improves, and students are more aware of their own academic performance. Additionally, feedback fosters student academic competence and promotes increased institutional adjustment (Tagg, 2003).

Intervention and early alert can exist in homegrown systems or in models that are professionally designed and marketed to colleges and universities. Paper systems and computerized methods also exist. Institutional size impacts the usage of support systems and how students are targeted. The majority of research on early alert and warning systems is limited, since most findings represent small enrollments and sample sizes (Simons, 2011). Support systems in large institutions are limited in scope and efforts have to be far-reaching (Varney, 2008). For many large institutions, the first sign of academic trouble for students is typically when mid-term grades are released (Kuh, 2007). Tinto, (1993) and Cuseo (2006) explained that mid-semester is typically too late for students in severe academic trouble to recover. Many early alert systems are designed to provide feedback prior to midterms to allow designated personnel to be notified of academic distress and have adequate time to provide supports (Simons, 2011). Without early alert, students who are not labeled as at risk may fall through the cracks until mid-term grades.

It is necessary to consider financial aspects of using early alert systems. Tinto (2007) pointed out that institutional resources are diminishing. Singell and Waddell (2010) added that institutions are forced to decide which support services are most cost-effective when attempting to retain students. It is more logical to retain students and focus institutional dollars on such retention efforts than to recruit and admit new students who are also lost to attrition (Simons, 2011). In reality, retaining students is much more cost effective than recruiting new students (Bean, 1990; Hossler & Bean, 1990; Schuh & Gansemer-Topf, 2005). Losing even a few students can have major fiscal impacts for institutions. Pardee (2004) concludes that campuses cannot waste time and efforts on flawed programs that fall short of retention goals. Kuh (2006) proposed that to meet financial thriftiness and shared responsibility for retention on campuses,

early alert systems that involve a network of individuals to support the program and be accessible to students in need are great tools to increase retention and student engagement.

Simons (2011) pointed out that early intervention models and early alert system usage is increasing steadily; however, she noted that research and literature on the subject are lacking. Researchers have theoretically and empirically linked retention and graduation to students' abilities to establish peer and faculty relations (Astin, 1993; Pascarella & Terenzini, 2005). Student success is, to some extent, predicated upon the degree to which one feels welcomed by an institution (Habley, Bloom, & Robbins, 2012; Hurtado & Carter, 1997). As such, the basis of most early alert systems use Tinto's (1993; 2007) student interaction theory in unison with other student development and engagement theorists' findings to provide outreach to struggling students and increase persistence and student success.

While differences exist in early alert systems, existing best practices state that successful systems identify the target audience specifically, define clear intervention processes, and create formal feedback systems (Farnum, n.d; Lynch-Holmes, Troy, & Ramos, 2012). For this reason, many commercial products exist to help institutions establish early alert systems on their campuses. DropGuard™, Early Alert Retention Software™, GradesFirst™, insight Early Alert™, MAP-Works™, Starfish™ Early Alert System, Student Early Alert System™, and Pharos360™, are a few. The process of early alert and intervention creates an efficient and effective network for referrers, responders, and students. Widening the safety net for students makes it is harder for them to fall through the cracks thereby decreasing attrition rates by retaining students and improving student satisfaction (Kuh, Kenzie, & Schuh, 2005). A departure from Astin's (1987) early warning system ideas, commercial products have very large support

networks, allowing students in need to receive assistance and timely information from individuals or campus support services (Seidman, 2005; Swail, 2004; Varney, 2008)

St. John Fisher College is also an example of a homegrown early intervention system. With an 83% retention rate, the campus utilizes three levels of monitoring students. Ghera, Erklenz-Watts, Lynd-Balta, and Ambrosetti (2012) explain the three facets that includes faculty submission of mid-term grades to academic advisors who hold meetings with students to discuss academic progress, a committee comprised of faculty and staff that evaluates all student academic performance instances, and a student behavioral team comprised of staff that investigate concerns to assist students struggling academically and/or socially. No formalized structure is in place, however services for students are present. Homegrown systems, while providing institutions more control and accessibility, lack dynamic features professional products offer. Additionally, homegrown programs exist more frequently in smaller institutions (Wasley, 2007).

Although enrollment is small, approximately 1,000 students, and the institution is private, Paul Smith's College boasts a robust early intervention program that celebrates 91% faculty participation and a 12% increase in retention (Starfish, 2011). The intervention strategies occur early enough to impact student success through targeted programs, early outreach, and voluntary support (Taylor & McAleese, 2012). Paul Smith's College employs the Starfish™ early alert system as the power behind its student support initiative and uses historical data to identify at-risk students through predictive modeling via demographic data, test scores, Noel Levitz College Student Inventory (CSI) data, and intended major (McAleese & Taylor, 2011; Starfish™, 2010). The campus reports a 12% increase in first term GPA of freshman students, 15% increase in the percent of students in good academic standing, 24% decrease in D final

grades and 33% in F final grades, 25% decrease in the percentage of students with a least one D or F final grade, and a 23% increase in degree completion as a result of Starfish™ implementation (Taylor & McAleese, 2012). Taylor and McAleese found that the Comprehensive Student Support Program (CSSP) model has returned nearly $2 million in net student revenue improvements due to increases in the overall retention rate experienced since 2010.

Another institution, Hanover College, has designed and implemented its own early alert system, enacted in 2005, which incorporates five campus officials to compose an Early Alert Team (Wasley, 2007). Membership is comprised of the registrar, associate dean of students, dean of admissions and financial assistance, special assistant to the president, director of the learning center, and a faculty liaison (Habley, Bloom, & Robbins, 2012). The team works behind the scenes to encourage the campus to reach out to students who have been identified as struggling personally or academically (Wasley, 2007). Habley et al. (2012) noted that the specific goals of the system aim to help students, retain students, inform advising, inform admissions, and gather and interpret accurate retention information. Hanover is a religious-based, academically rigorous institution in Indiana with an enrollment of approximately 1,000 students.

The University of North Texas is a large institution that utilizes an early alert system to prevent attrition. With an enrollment of 36,000, the campus began with a course-centered effort looking at poor performance and absences as intervention points (Tampke, 2010). The Early Alert Referral System (EARS) is embedded within the PeopleSoft Campus Solutions student information system and is accessible by faculty, advisors, and students. Findings from research on the EARS system produced information for administrators to consider. Specifically, findings showed positives related to linking information within the campus student record system,

notification of academic advisor, and tracking (Chappell, 2010). On large campuses, early alert can make the institution feel smaller through personal interactions such as email outreach as a result of early alerts. Tampke (2010) noted that the institution is constantly looking to make the system more robust and more effective to keep students enrolled and successful.

Another large institution, Virginia Commonwealth University (VCU), has received acclaim for its early alert system that incorporates multiple methods of communication with students. The institution sends academic progress reports to students by the eight week of each semester (Varney, 2008). As a result of low response rates, 42%, of students contacted with early alert referrals at Morehead State College, VCU developed approaches to improve student response (Hudson, 2005). While most early alert programs utilize telephone calls or letters for outreach (Cuseo, 2004; Eimers, 2000; Geltner, 2001; Pfledging, 2002), VCU incorporated emails, and electronic communication into their efforts. Eimers (2000) suggested that institutions follow VCU's example and revise their early alert processes "to become less formal, more frequent, less intimidating, more closely linked to the faculty member who is teaching the course" (p. 13).

A number of community college and university systems also utilize early alert systems to approach system-wide issues related to student attrition. Programs like the President Obama administration's American Graduation Initiative and the College Access and Completion Innovation Fund introduce opportunities for students but bring with them a new focus on retention, persistence, and graduation for institutions (Coley & Coley, 2010). The reality of increased attention to and scrutiny of community college, private, and public schools requires institutional commitment to monitoring and supporting retention initiatives. The focus on retention in community colleges is a rather new venture due to the nature of frequent dropouts

and students who are part time and even attend in atypical enrollment patterns (Bontrager, 2004; McBee & Shi, 2010). As such, early alert programs have emerged as a tactic to retain and graduate students at the community college level. Community colleges recruit and enroll diverse student populations at a greater level than traditional four-year colleges and universities (Reason, Terenzini, & Domingo, 2006). Institutions such as Sinclair Community College, Community College of Alleghany County, Hudson Valley Community College, and Leeward Community College have led the charge with homegrown systems that work to bridge the gap between unique student populations that represent their respective community college enrollments and low persistence rates.

Wasley (2007) pointed out that early alert systems no longer focus just on academics, but take into account the whole student experience. Successful early alert systems create a web of support structures that promote interpersonal relationships across campus. Whether homegrown or professionally designed, to be successful, quality early alert systems will support student retention initiatives, identify at-risk students before they struggle, makes efficient use of resources, provide interactions to support students, use a team approach to support students, and increase communication between students and support services (Hamman, 2012). Regardless of the size or characteristics of the institution, Lynch-Holmes, Troy, and Ramos (2011) posited that while a strong foundation in best practices and student development and engagement theory is a must, institutional leaders must be innovative with intervention strategies.

Technology is a critical part of learning for college students and is an essential tool for communication and a means of engagement (Educause, 2014). The use of technology on college campuses infiltrates every department, serving as a cost-effective way to keep records on enrollment, student populations, course registration, and many other functional purposes.

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Technological advances in the academic sector have led faculty and institutions to find ways to reach students in effective manners. Technologies have attracted academics looking for ways to engage and motivate students to be more active learners (Hughes, 2009). Chickering and Ehrmann (1996) suggested that the use of technology is an effective method to implement and reinforce the seven principles of good practice for increasing student engagement. Specifically, Kuh (2009) reported that institutions can directly influence engagement by implementing the seven principles through technology usage in instruction and other academic efforts.

Although the linkage between technology and retention, graduation, and engagement is widely accepted and guides much of contemporary early intervention strategies on college campuses, little empirical research exists focusing on specific approaches. Students are however more likely to engage in courses where technology is readily utilized and celebrated, thus perpetuating the idea that technology utilization breeds more active and motivated learners (Annetta, Minogue, Holmes, & Cheng, 2009; King & Robinson, 2009). In the Educause (2013) study, 54% of students reported more active involvement in courses that use technology and 74% responded that they have enrolled in at least one course that includes some online components. Institutions note the increased incorporation of technology in education; however, it is imperative that faculty and administrators assess instructional strategies to be responsive to student preferences (Chen, Lambert, & Guidry, 2010). Simply offering students opportunities to utilize technology in courses, whether through course management systems, interactive educational products such as clickers, or text messaging, proves fruitless if not integrated with student preferences.

Notably, assumptions can be problematic without taking careful consideration of student learning needs when utilizing technological tools to reach students. Colleges and universities can

easily make mistakes when attempting to produce and install academic measures for students, since faulty assumptions and hunches from professionals attempting to "put themselves in student's shoes" are rarely correct (Junco, Heibergert, & Loken, 2010, p. 2). Technology has to potential to significantly improve efficiency, albeit with challenges of effectiveness. The majority of early alert and warning programs involve technology as a vital component; nonetheless, it is imperative that administrators remain vigilant to ever-changing student technological preferences and usage patterns to ensure effectiveness (Yeager & Walton, 2011).

The Educause Center for Analysis and Research (ECAR) (2013) annual report of undergraduate students, encompassing over 251 institutions and over 112,000 students, works to answer critical questions related to student technology usage. The report unearths interesting perspectives of student technology preferences and usage. An astounding 67% of students surveyed noted that technology helps them feel connected to the university. Conversely, 53% of undergrads wished their instructors would communicate more through face-to-face interactions. Of those surveyed, 53% also requested faculty usage of course management systems, such as Blackboard. Blackboard also ranked at the top of students' list of websites "they can't live without". Fuchs and Fuchs (2002, 2006) noted that extra effort is required for monitoring large class enrollments. Usage of technology such as course management systems within early alert systems makes larger enrollments more manageable with settings that automate the alert process.

Crook (2008) explained that students prefer that technology be incorporated into the learning process and typically have higher approval and satisfaction scores for faculty who integrate technology into education. In response, early alert systems allow colleges and universities to incorporate technology with student progress monitoring, instruction, and support services. Early alert and intervention systems are viewed to have value in the higher education

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community as an appropriate retention strategy. Support, although plentiful, is countered by criticism concerning the lack of empirical data to directly correlate early alert and intervention systems to increased student persistence in the form of retention and graduation rates. Institutions typically develop methods to identify and reach students, but lack tangible statistics to track and link outcomes to those initiatives (Simons, 2011).

The Noel-Levitz Student Satisfaction Report (2013) pointed out that over the past five years, public higher education has seen a decline in meeting student expectations, with most recent studies reflecting large performance gaps. Developing and implementing comprehensive student retention programs that combats such reports requires commitment from campus leaders, faculty, and staff (Swail, 2004). Without complete campus buy-in, strategies to improve student persistence and contest student attrition will prove unfruitful and a waste of campus resources and energy. Hallenbeck (2010) referred to the use of early alert systems as a way for campuses to "close the loop" by allowing faculty to involve other campus officials with struggling or excelling student performance through technology. Developing and implementing early intervention and alert systems on college campuses is a solid way to assist students in the transition to college and to provide appropriate support to build relationships and support structures to keep them progressing towards graduation.

<div align="center">**Summary**</div>

The issue of student retention and graduation across the nation is a complex one. Mandates for increases in retention and graduation rates have led institutions of higher education to assess current strategies continuously and pursue innovative approaches to recruiting, retaining, and ultimately graduating students. As noted by Bradley and Blanco (2010) and Donnelly (2010), early intervention through formal early alert system usage is not only an

appropriate strategy for institutional attrition combat, but the single most popular method used to solve the student persistence issue. Brophy (2013) suggested that incorporating technology such as early alert systems into retention efforts provides shared environments for institutional data exchanges about students in real time. The timeliness of intervention is important; therefore, early alert provides an appropriate platform for significantly accelerating the process of problem identification and intrusion.

The introduction of early intervention systems for the purpose of promoting higher student retention has emerged as a response to scrutiny for heightened accountability from stakeholders. Research about early intervention systems that incorporate cross-campus partnerships to promote student engagement provides information about the viability of such systems to be applicable to all college campuses. However, the literature concerning early warning and alert system usage emphasizes the holistic buy-in from institutions to generate increased student engagement and retention. Such campus-wide buy-in is difficult to gain and factors to motivate students to engage and seek valuable assistance through early intervention system usage remain relatively unidentified and not uniform.

Application of the principles associated with student development, student persistence, and student engagement theory through usage of early alert and intervention systems is relevant for this study. Understanding the underpinnings of these theories and the role they play within early intervention strategies positioned the study to gain greater insight into student perceptions of early intervention strategies generate a better comprehension of whether the approaches foster student persistence, sense of belonging, motivation, and intentionality.

Although research exists that appropriately frames student persistence, engagement, and academic success, the usage of formalized early intervention, warning, and alert systems is

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innovative in nature and few empirical studies exist. Simons (2011) spoke directly to the need for studies to be conducted that specifically investigate student opinion of early intervention. Popularity of early alert systems is widespread, but there are few definitive best practices to guide campuses through the research, development, and implementation of such systems. The present study seeks to close the gap in the literature and provide commonly accepted practices by focusing on student perceptions of early intervention system usage within a large university.

CHAPTER 3: METHODOLOGY

The purpose of this study is to discover the perceptions of undergraduate students as they experienced early alert system monitoring at ECU. Utilizing the theoretical constructs of the reviewed literature, as well as practices outlined by student engagement and student development theories, this study addresses student's perceptions of the use of Starfish™ Retention Solutions system and its capabilities to connect students to campus, motivate action to seek resources, and contribute to satisfaction with education. This chapter describes the methods and procedures used in this mixed methods inquiry, including research design, research questions, research setting, and sample population. In addition, assumptions, instrumentation, and data collection specifics are presented. Lastly, the chapter presents and discusses the analysis of the study data.

Research does exist on the importance of involvement and engagement in higher education as a tool to recruit, retain, and graduate students, but there is no data that examines the impact of early intervention strategies. Early alert systems have been identified as a useful retention and graduation initiative in higher education (Wasley, 2007). However, there is little or no empirical research investigating the impact of early alert and intervention strategies on student engagement, which could provide potential opportunities of connection for students, enriching academic experience and leading to increased persistence, retention, and graduation rates.

As higher education faces budget reductions, it is imperative to know what academic programs and strategies are most effective. Examining student-university connections through Starfish™ and student perceptions of early alert system usage, this study examined the perceptions of undergraduate students on the subject of early alert system usage at ECU.

Research Questions

In order to determine student perception of early alert system usage, this study focused on student opinions of their educational satisfaction, motivation to seek resources, and sense of belonging through the use of the Starfish™ Retention Solutions system, by investigating the following research questions:

1. Do students perceive early alert systems to increase their sense of belonging to campus?

2. Does the use of early alert systems increase student satisfaction with their education?

3. Do early alert notifications increase student motivation to utilize campus resources?

4. Do differences exist in the perception of early alert systems based on demographics?

Based on the four research questions, one null hypothesis was generated and investigated in this study. It is as follows:

1. There was no significant difference in the perception of students regarding early alert systems usage based on demographics.

Research Design

The design of this study incorporated cross-sectional survey research with open-ended response questions to determine how students perceive the Starfish™ early alert system at ECU. Comparing multiple cohorts at the same moment in time, cross-sectional design provides data on the entire population under study (Pascarella & Terenzini, 1991). This research design method was utilized in order to provide the data necessary for variable analysis. Cross-sectional design was used because cross-sectional study allows for maximum variable analysis as opposed to longitudinal inquiry, which limits variable volume and requires extensive data collection time and resources (Payne, 2004).

Studies addressing student perception of campus strategies to build sense of belonging are applicable to large institutions where a sense of belonging is sometimes more difficult to build due to enrollment size (Jacobs & Archie, 2008). Although large schools face a clear disadvantage in attempting to develop a sense of community for students, implementation of strategies to make campuses feel smaller and more nurturing to individual student needs are on the rise (Coley & Coley, 2010; DeNeui, 2003; Wiseman, Gonzales, &Salyer, 2004). Many large institutions are turning to information technology, in the form of early intervention systems, to assist in the creation of students' sense of community, in addition to improving retention and graduation rates (Fowler & Boylan, 2010). Colleges and universities typically implement and utilize early alert systems differently; therefore including multiple campuses in this research study was not a viable option due to the considerable variation across institutions in respect to usage (Coley & Coley, 2010).

To address the research questions, a self-administered online survey, cross-sectional in nature, was used. The survey instrument incorporated items consistently reference and included in national surveys on student retention, motivation, satisfaction, and belonging. Survey items addressing student motivation were based on results of the National Survey of Student Engagement (NSSE), an assessment that uses information about student participation in programs and activities that institutions provide for their learning and personal development as an indicator of student engagement. In addition to the NSSE, the Intrinsic Motivation Inventory (IMI) was also referenced to assess participant experience related to a target activity, in this case motivation in seeking campus resources as a result of early alert notification. Perceived student satisfaction with education, in addition to items regarding belonging, was based on items from the First Year Initiative (FYI), a product of collaboration between Educational Benchmarking,

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Inc. (EBI) and the Policy Center on the First Year of College. Statistical retention and graduation data were compiled and provided through ECU's Institutional Planning, Assessment, and Research (IPAR), a division within academic affairs.

The survey instrument, developed and administered by the researcher, is designed to investigate how students perceive the use of an early alert system as a means to affect their motivation to seek resources, satisfaction with their education, and development of a sense of belonging. All undergraduate students enrolled in courses at ECU during the summer and fall 2014 semesters, approximately 21,000 students, will be extended an invitation to participate in this research project. The survey will be administered and data collected occurred after the initial wave of Starfish™ notification emails will be received during the summer 2014 semester. This timeframe allowed for freshman participants to be exposed to the early alert process, roughly one academic year or two semesters, thus providing them appropriate experience in order to report effectively their perceptions of the system.

Site

The location of this study was ECU, a large four year public coeducational institution in the southeastern United States. ECU is a constituent member of the 17-campus consolidated UNC System. With an enrollment of over 27,000, this institution has a Carnegie classification of doctoral research intensive and is accredited through the Commission on Colleges of the SACS in accordance with the Principles of Accreditation. Authorized to confer 104 undergraduate major programs and 113 graduate level degrees (East Carolina University Fact Book 2011-2012, n.d.), ECU's current enrollment places it as the third-largest institution in the UNC System.

The institution's large enrollment conflicts with the small community environment experienced on the campus. Spanning 530 square feet, main campus houses the majority of

campus residents and academic facilities. Three other campuses operated by ECU include the health sciences complex, west-research facility, and the field station for coastal studies. The institution is viewed as a regional beacon, providing economic and cultural stimulus to eastern North Carolina. Although initially created to train teachers to expand educational opportunities in the area, the university has evolved into a research-focused campus, renowned for its education, business, fine arts, and health-related ventures.

Continuing its early mission of prosperity through service to the region, ECU's main goal is to produce quality graduates who are prepared to lead, which is directly mentioned in the University's mission statement (ECU, 2013). Located in eastern North Carolina, long considered the most economically-challenged area of the state, ECU is not considered to be demographically diverse, enrolling 83% in-state freshman, 85% transfer students from in-state institutions, and only 28% of the undergraduate population are non-white (East Carolina University Fact Book 2012-2013, n.d.). In acknowledgment of demographic breakdown and regional needs, ECU attempts to develop, implement, and promote social, economic, and cultural initiatives. As referenced on the campus website, the university values the relationship with the regional community and routinely collaborates with UNC System administrators to focus efforts toward prosperity (ECU, 2013).

In response to UNC System wide mandates to improve the rate of retention of freshmen to their sophomore year and to increase four-year and six-year graduation rates, each constituent campus is investigating issues surrounding retention and graduation rates (UNC Tomorrow, 2012). Imperative is the examination of strategies attempting to improve those areas throughout the UNC System. Specifically attempting to identify or determine causes or reasons of lower persistence to the sophomore year, ECU employs varied resources in an attempt to develop and

implement strategies to combat student attrition (J. Geissler, personal communication, November 30, 2012).

Specifically, ECU was selected as the location of this study due to its substantial use of the Starfish™ system as a retention tool. ECU is considered a "super user" of the early alert product and over the period of time of usage, has tallied over 160,000 notifications (D. Yaskin, personal communication). Although other institutions in the UNC system utilize Starfish™, their usage levels do not compare to the complexity of ECU. The selection of ECU as the location for the study provides the best opportunity to add to current literature surrounding early intervention strategies to improve student sense of belonging on college campuses.

Early Alert System Usage at ECU

Like most institutions, ECU faces scrutiny to develop and implement effective retention strategies. Many strategies have existed on campus, although no formal process or collaborative structure was used. Early intervention has been a reality for the institution for a while, however, intervention systems lacked structure and scope of professional early alert products. Although not formalized, the process of identifying at-risk populations and offering support has existed at the institution in different forms. With a diverse student population, increasing enrollment, large class capacities, and a large volume of distance education offerings, early alert system usage is a logical choice to provide support to students. ECU utilized a loose interpretation of an early alert tool until the system could no longer meet campus needs. As a result of discussions by campus committees invested in student persistence, planning for a dynamic student support network that could function as an early intervention system was developed.

Faculty at ECU historically used a homegrown early alert system to identify students in academic difficulty. Referred to as Academic Progress Reports (APRs), the system had many

limitations and allowed only for the reporting of academic difficulty for first-year students (freshman/transfer) once a semester. Geissler, Trifilo, Coghill, and Asby (2011) reported that faculty expressed several concerns about the APR system:

1. It restricted faculty to reporting just first-year attendees (and not all students) in academic difficulty,

2. It did not allow faculty to correct errors in reporting,

3. It restricted faculty to reporting only one time/term,

4. It targeted only students in academic difficulty and did not allow for notifying students with academic excellence, and

5. Follow-up was difficult due to a lack of direct connection with instructional and academic advising resources.

Discussions between Academic Affairs professionals, including academic advising, registrar's office, and campus tutoring, and ECU informational technology staff revealed that enhancement of the existing APR system to include capabilities requested by faculty would be unfeasibly expensive and time-consuming. In lieu of the shortcomings of the APR system, ECU administrators investigated existing professional early intervention products for purchase.

Effective fall 2011, ECU implemented a new academic early alert tool, Starfish™, and intervention process, the student support network. Through this early alert system, faculty can inform students of their academic performance within a course at any time throughout a semester. Notifications called "kudos" (positive reinforcement) and "flags" (academic concern and/or attendance) are sent to the students' university email account and copied to their academic advisors. All notifications have a set template that allows faculty to add additional comments for more detailed feedback. In addition to their academic advisor being informed, other connections

(athletics, honors, tutoring, campus living, and other support services) in the students support

network are also notified via email. Outside email reports, anyone connected to a student can

view raised notifications by logging in to the system through ECU's Blackboard course

management system.

Although academic progress notifications are intended to provide students with

immediate feedback about their course progress, they have the capacity to be a vital tool in the

academic advising process. Academic advisors are in a unique position to use academic progress

notifications sent by instructors to guide advisor actions taken with the student. Access to

progress notifications informs advisors of student achievement before it is too late to help the

student. Following up with students who have received notifications, specifically difficulty

notifications, reinforces the importance of taking action after receiving a flag. Although email is

the most common mode of follow-up for advisors, phone calls and face-to-face meetings are

other acceptable forms.

Once the members of a student's support network are informed, the follow-up process

begins. Follow-up consists of communication through email, phone, or face-to-face meetings.

The purpose of follow-up is to create a dialog that can help assess the student's needs in order to

connect the student to the proper support services. In many cases, students will receive

communication from several individuals within their support network. The primary objective is

for the student to take action towards resolving the raised concern. Action may include talking to

their professor, meeting with their advisor, changing study habits, seeking tutoring, or

withdrawing from a course.

Although instructors initiate the process, a major component of successful early

intervention strategies is the follow-up from a campus professional (Cuseo, 2007). The early

alert system provides a tangible way for advisors to communicate with their students. The ability for advisors to reiterate positive or negative notifications from faculty provides an additional layer of support and motivation to students. The 2013 National Student Satisfaction and Priorities Report details results from nearly 816,000 students at 1,098 institutions through their responses to the Student Satisfaction Inventory™ (SSI). Overall, students rate academic advising as a strength and place it as a top priority in their college experience (Noel-Levitz, 2013). The importance of academic advising in higher education has never been more valued or utilized. In fact, ECU has over 50 professional advisors with an average advisee load of 250-300 students. Connecting students with appropriate campus resources and developing strategies for improvement solidifies the efforts faculty intend when originally notifying students through the early alert system.

Students are provided an opportunity to use the student support network through Starfish™ to help achieve academic success. The student support network may include faculty, academic advisors, campus living staff, the tutoring center, and other services on campus associated with the student. Students can personalize their Starfish™ profile to include a photo of themselves, set up appointments with campus resources, view their current and past notifications, and even search or scroll for an appropriate support service through the comprehensive list. Student personalization attempts to allow students to have more ownership in their academic efforts and works to break down the idea that Starfish™ is a merely a computer monitoring system. Starfish™ incorporates personalization options for users to mirror social media interfaces (Yaskin, personal communication, 2012).

The popularity of social media among college students informs the decision to make Starfish™ utilize personalization features, speaking to students in "their" language. Prensky,

(2001) noted that students of traditional college age, commonly referred to as Generation Y or the Millennial Generation, are digital natives, rather than digital immigrants like those who attended college before them. Bennett, Maton, and Kervin (2008) argued that these students are the first generation to have spent their entire lives in the digital environment, having information technology shape how they live and learn. Bolton, Parasuraman, Hoefnagels, Migchels, Kabadayi, Gruber, Loureiro, and Solnet (2013) noted that this generation's dependence on, and use of, social media and information technology has had a profound impact on the global marketplace, the workplace, and society. This phenomenon has infiltrated higher education in the form of online course registration, course management, and monitoring of student performance through early alert system usage.

ECU's student support network is a key tool for identifying students with academic difficulty and connecting them to appropriate campus resources to promote success. The process is not passive, but proactive in nature, requiring unified effort by faculty, academic advisors, and campus support services. Along with the early alert notifications, monitoring and support of students receiving those notifications is fundamental to the process. In addition, reports are generated to allow for connectivity and examination based on type of flags, student populations, academic departments and majors, and individual courses. Within the early alert system, a comprehensive listing of all resources in a student's success network is provided with contact information listed. The follow-up strategies that encourage students to contact instructors and to consider utilizing campus support resources are critical factors in the process. Starfish™ initiates and allows for monitoring to occur while the PTC provides tangible options for improvement. In order to assess student participation in campus tutoring services, a monitoring system where

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students check in at the PTC was created. The formal early alert system and intervention process ECU utilizes is displayed in Figure 4.

A series of pilot tests were conducted during the 2010 and 2011 academic years, focusing on testing the technical compatibility of the system with ECU's existing information technologies. The pilot tests served to provide more opportunity for a smooth rollout to the entire campus population. The first, a technical pilot during fall 2010, consisted of 14 instructors and 172 undergraduate students. Overall, the technical pilot was successful with only minor issues surrounding technical comparability aspects. Starfish™ professional technical support staff were expedient in working to resolve issues in a collaborative manner with ECU staff. The communication and technical foundation laid during pre-pilot planning was beneficial. Preparation for the release to the entire enrollment through the technical pilot is a must to prevent catastrophe (J. Geissler, personal communication, 2014).

In spring 2011, a second pilot test involving more participants was completed and expanded to include 20 faculty, two academic advisors, and 1,792 students. This pilot test focused on dynamic Starfish™ functionality, utilization by multiple users, and effectiveness for faculty, advisors, and students. Included in this second pilot were freshman level foundations curriculum, or general education, courses within the Thomas Harriot College of Arts and Sciences. The college represents the largest concentration of ECU majors and foundation curriculum courses (ECU Undergraduate Catalog, 2014). Faculty rosters ranged from 25 to 250 students per course. Also incorporated in the second pilot was the use of academic advisors, who provided follow-up to students who received notifications. An important addition to the pilot was the implementation of academic advisors as secondary points of contact for students, one of the

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│  │    Step 1: Faculty Raise Starfish Notifications on Students │  │
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│  ┌───────────────────────────────────────────────────────────┐  │
│  │                    Type of Notifications:                  │  │
│  │    Kudo/Positive    Academic Difficulty   Attendance Related│ │
│  │  ┌───────────────┐ ┌────────────────┐ ┌──────────────────┐ │  │
│  │  │Off to a Good  │ │Low Test/Quiz   │ │Excessive Absences│ │  │
│  │  │Start          │ │Scores          │ │Stopped Attending │ │  │
│  │  │Keep Up The    │ │Unsatisfactory  │ │Never Attended/   │ │  │
│  │  │Good Work      │ │Coursework      │ │Participated      │ │  │
│  │  │Outstanding    │ │Concerned       │ │Disruptive        │ │  │
│  │  │Performance    │ │                │ │Behavior*         │ │  │
│  │  │Showing        │ │                │ │                  │ │  │
│  │  │Improvement    │ │                │ │                  │ │  │
│  │  └───────────────┘ └────────────────┘ └──────────────────┘ │  │
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Step 1: Faculty Raise Starfish Notifications on Students

Type of Notifications:

Kudo/Positive	Academic Difficulty	Attendance Related
Off to a Good Start Keep Up The Good Work Outstanding Performance Showing Improvement	Low Test/Quiz Scores Unsatisfactory Coursework Concerned	Excessive Absences Stopped Attending Never Attended/Participated Disruptive Behavior*

Step 2: Email Sent to Student	Step 3: Advisor Connect/Follow-Up	Step 4: Network Connections
Type of notification is identified Faculty provide additional comments Support services identified	Notifications for advisees available Follow-up with advisees Faculty communication if needed	(e.g. Athletics/ Honors/Housing) Tutoring follow-up Notifications always available Follow-up if needed

Note. * Disruptive Behavior Notification is sent to Dean of Students. No contact is made with the student until a conversation takes place with the faculty member regarding concerns.

Figure 4. East Carolina University Early Intervention System Model structure.

holdovers from ECU's original APR system that was viewed as extremely important to the intentionality of the Starfish™ system (J. Trifilo, personal communication, 2011).

ECU staff developed six flags for the pilot tests. Table 4 identifies the flags and the number of students who received flag notification(s). All flags generated an email notification to students with exception to the disruptive academic behavior notification. The disruptive academic behavior notification is sent to the Office of Student Rights and Responsibilities which then provides follow-up to the concerned faculty member. Leaving the student out of this communication is deliberate.

Of the 1,792 students in the pilot, 958 (53%) of the students received one or more notifications. An academic issue flag, poor academic performance, excessive absences, or stopped attending, was raised on 699 (39%) of the students in the pilot test. There were 246 (13.5%) students who received an outstanding academic performance flag. As illustrated in Table 5, 73% of flags were raised for academic concerns. Positive performance flags accounted for roughly one-fourth of pilot test notifications.

At the culmination of the second pilot test a series of surveys were created to assess overall thoughts of the Starfish™ system. During spring 2011, faculty and advisors who participated in pilot testing provided feedback through group and individual meetings with Starfish™ coordinators. These meetings were to gauge initial responses to the system and to support network structure. Advisors expressed the benefits of being notified of their advisees' progress and noted that students were overall receptive to their advisor's follow-up and suggestions for improving academic performance. Faculty expressed their satisfaction with the system's ease of use regarding navigation of technical aspects and raising of flags. Feedback on types of flags used, wording of notification messages, and specific aesthetic suggestions were

Table 4

Students Receiving One or More Notifications From Faculty During East Carolina University

Starfish Pilot Testing: Fall 2011

Type of Notification	Students Receiving One or More Notifications (#)	Students Receiving One or More Notifications (%)
Poor Academic Performance	465	26.0
Outstanding Academic Performance	246	13.5
Excessive Absences	200	11.0
Stopped Attending	34	2.0
Never Attended	13	0.5
Disruptive Academic Behavior	0	0
Total Students Receiving Notifications	958	53
Total Students in Pilot Study	1792	

Note. Source: East Carolina University Starfish Pilot Study.

Table 5

Notifications Raised by Faculty During East Carolina University by Category in

Starfish Pilot Study: Fall 2011

Type of Notification	Total Number of Notifications Raised (#)	Percentage by Category (%)
Poor Academic Performance	755	51
Outstanding Academic Performance	383	26
Excessive Absences	269	19
Stopped Attending	44	3
Never Attended	18	1
Disruptive Academic Behavior	0	0
Total Notifications Raised	1469	100

Note. Source: East Carolina University Starfish Pilot Study.

also included. Surveys for students, faculty, and academic advisors were also fabricated and disseminated to all participants of the pilot through the on-line survey instrument ECU Qualtrics online survey software.

Of the 20 faculty participants, 14 responded to the survey, yielding a 70% response rate. Overall, faculty rated Starfish™ as a worthwhile, effective retention tool. Faculty cited that the positive notification, outstanding academic performance flag, tended to be more impactful in their perspective. Furthermore, all faculty reported that they would utilize Starfish™ again due to its perceived effectiveness and ease of use. The pilot test survey asked faculty to gauge time commitment associated with Starfish™ as well. The time commitment ranges used in the survey included; one to three hours a week (14%, N=2), four to six hours a week (71%, N=10), seven to nine hours a week (14%, N=2), and 10 or more hours a week (0%, N=0). Starfish™ proved not to take up an unusual amount of time during pilot testing. Faculty also had the option to allow students to use Starfish™ calendar capabilities to schedule appointments. Half of the faculty utilized this option (N=7 using the function, N=7 not using the function) with 36% (N=5) reporting that the appointment scheduling feature was beneficial. Two faculty (14%) did not find the scheduling option helpful.

Students who participated in the second pilot study were surveyed in two separate groups to reflect those students receiving outstanding academic performance flags and those flagged with poor academic performance or excessive absences notifications. Of the 246 students receiving the positive notification, 22% responded to the survey (N=55), while of the 665 students receiving the academic performance concern flags, only 7% (N=45) completed the survey. Student responses in both survey groups considered the notifications to be beneficial to their academic success and reported that the Starfish™ flags created a feeling that their professor

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was paying attention to their performance. Students also commented that they preferred that all instructors utilize Starfish™ in their courses. Differences existed between the groups of students surveyed. Those students receiving outstanding academic performance flags rated Starfish™ higher than those receiving negative academic flags. Additionally, of the students responding to the survey flagged with academic concern notifications, 69% took some action as a result of the flag. Typical actions reported were speaking with their professor or academic advisor, seeking tutoring, or spending more time studying. Overall, survey results from faculty, advisors, and students in the pilot test found the Starfish™ system and the student support network structure to be beneficial.

In addition to the pilot test focus groups and surveys, statistical analysis was completed through the Starfish™ reporting capabilities by the PTC to contact students who received flag notifications. All students receiving a poor academic performance flag (N=665) were sent an email from the PTC with information regarding tutoring resources and how to connect to the center. About one-fifth of all students receiving a poor academic performance or outstanding academic performance notification sought tutoring resources (see Table 6). An interesting result was that students receiving positive performance notifications attended tutoring at almost as high a rate as those students receiving academic concern notifications. Through Starfish™, students were made more aware of the services offered through the PTC and other campus tutoring resources, including the University Writing Center, Freshman Writing Studio, and Mathlab.

Pilot testing in fall 2010 and spring 2011 yielded many conclusions related to the implementation and usage of Starfish™ and the student support network. As a result of pilot testing, it was determined that ECU and Starfish™ technical compatibility not only exists, but that issues were resolved quickly. Faculty, students, and advisors supported the Starfish™

Table 6

Breakdown of Student Notifications Raised by Faculty During East Carolina University:

First Time Full Time Cohort Fall 2012

Type of Notification	Students Receiving Notification	Students Receiving Notification and Sought PTC Assistance
Poor Academic Performance	465	97 (21*)
Outstanding Academic Performance	246	45 (18*)
Total Notifications Raised	711	142 (20*)

Note. *Percentage of Total Students Receiving Flags. Source: East Carolina University Starfish Data.

interface and deemed it easy to navigate and use, and beneficial. Students believed Starfish™ to be useful in their academic success efforts, noted by action taken or motivation to perform as a result of flags. Awareness of and connection with campus resources were also two benefits drawn from the pilot testing and subsequent focus groups and surveys.

In response to pilot testing, actions were taken by administrators to improve the functionality of Starfish™ and to increase accessibility to faculty, students, and support services. Faculty requested more dynamic flag options within the Starfish™ system. Two additional positive flags, keep up the good work and showing improvement, were added to accompany the outstanding academic performance notification to meet this request. In response to the faculty feedback requesting alternate academic concern flags, the poor academic performance notification was eliminated. Contextually specific flag options, low test/quiz scores and unsatisfactory homework, were implemented for the fall 2011 semester. Table 7 provides a breakdown of notifications used.

Pilot testing yielded recommendations for Starfish™ and the student support network structure. Recommendations for ECU controlled factors included:

- Implementation of Starfish™ campus-wide for fall 2011, replacing the APR system as the ECU early alert system
- Develop a position for Starfish™ Project Manager to provide leadership at ECU
- Further expansion of and education about scheduling functionality to promote utilization by faculty and students
- Educate faculty through faculty training sessions
- Ensure collaboration with the faculty
- Inform faculty of the content of email notifications being sent to students, and

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Table 7

List of Notifications Utilized for Starfish™ Pilot Test Study at East Carolina University:

Fall 2011 Semester

Notification Name	Notification Description
Outstanding Academic Performance	Measured by A level coursework quiz/test performance
Showing Improvement	Improvement shown in coursework and/or attendance
Keep up the Good Work	Student is performing well on coursework/attendance
Low Test/Quiz Scores	Low scores on quiz/tests
Unsatisfactory Coursework	Coursework not turned in regularly/done incorrectly
Excessive Absences	Student does not attend class regularly/is tardy frequently
Stopped Attending	Student missed two straight weeks with communication
Never Attended/Participated	Student never participated or attended the course
Disruptive Academic Behavior	Student disrupts instructional activities

Note. Source: East Carolina University Starfish™ Early Alert System.

- Inform faculty if students sought services or spoke with anyone regarding a flag

- Inform faculty in the graduate and professional schools of Starfish™ capabilities. For instance, early discussions with Brody School of Medicine staff indicated an interest in using Starfish™ to track students in academic difficulty and require students to attend tutoring.

In addition to the ECU controlled recommendations, suggestions to the Starfish™ Retention Solutions corporation were also developed through pilot testing, including:

- Increase the number of students that appear per page when viewing a class roster through Starfish™. Currently, only 25 students appear per page and faculty have criticized this as being very cumbersome, especially for those faculty having 75+ students

- Create a feature that helps navigate through profiles without the system resetting (going back to page one) when the back key is used

- Increase the number of services that appear per page on the Success Network. Currently, only five services appear per page

- Allow profiles to be seen by students regardless of faculty/staff members having an active calendar – profile should be a separate page

- Create an option for faculty to send or not to send their flag comments to the student so that the comment would be included in the student email notification

- Ensure that Banner information is captured by Starfish™. For example, if the student's advisor is changed, this information is also automatically updated in Starfish™

These recommendations were submitted to the Starfish™ technical staff and applied to ECU's

Starfish™ interface in preparation for the campus release and integration for fall 2011 semester.

There were no problems with meeting the recommendations on the part of ECU or Starfish™. In

all, pilot testing provided administrators with the evidence that Starfish™ and the student support

network were dynamic replacements for the archaic APR system.

Since full implementation as the replacement to ECU's existing APRs, Starfish™ and the

student support network have amassed considerable student notifications and received positive

reviews across campus (J. Trifilo, personal communication 2014). Since fall 2011, faculty have

raised over 160,000 notifications to students (see Table 8). Currently, ECU utilizes 10

notifications that faculty can use to alert students of their progress. Functional notifications are

listed within Table 9.

One of the strongest collaborations within the student support network is the linkage

between faculty, students, and advisors with the Pirate Tutoring Center. Since centralized

tutoring was established in January 2008, the PTC has had a significant impact on student

academic success (J. Geissler, personal communication, 2014). The mission of the center is:

> to provide support for students through peer academic tutoring, academic success
>
> strategies, individual assessment and consultations, and outreach initiatives, programs
>
> and services that promote retention, meeting academic requirements and timely
>
> graduation.

Specifically, within the 2012-2013 academic year, the PTC tallied 23,792 student visits, an

increase of 57% from 2011-2012, serving 4,873 total students, which accounts for 24% of ECU's

undergraduate population. The center employs over 470 tutors and has developed an innovative

Table 8

Total Notifications at East Carolina University Since Starfish™ Implementation: Since Fall

2011 Semester

| | Semester | | | | | |
Notification Type	Fall 2011	Spring 2012	Fall 2012	Spring 2013	Fall 2013	Totals
Kudos (Positive)	11,974	14,059	15,235	15,371	30,139	86,778
Academic Difficulty	12,513	11,215	10,980	10,1013	12,681	57,402
Attendance	3,764	3,778	3,228	3,312	3,174	17,256
Totals	28,251	29,052	29,443	28,696	45,994	161,436

Note. Source: East Carolina University Starfish™ Early Alert System.

Table 9

Type of Notifications Utilized for the Starfish™ Early Alert System Effective: 2013-2014

Academic Year

Notification Category	Kudos (Positive)	Academic Difficulty	Attendance Related
Notification Title			
	Off to a Good Start	Low/Test Quiz Scores	Excessive Absence
	Keep up the Good Work	Unsatisfactory Coursework	Stopped Attending
	Outstanding Academic Performance	Concerned	Never Attended/Participated
	Showing Improvement		

Note. Source: East Carolina University Starfish™ Early Alert System.

tutor training system, certified by the College Reading and Learning Association (CRLA), which is the professional accreditation body for tutoring services. Tutors are volunteer based; however, some are paid when lead tutor training is completed. Within the 2012-2013 academic year, 9,890 volunteer tutor hours were completed. The center also received grant monies from multiple high-profile grant sources due to their production, innovative approaches, and connection with other campus resources. The PTC even established partnerships with academic programs to serve high-demand courses through special tutoring sessions, embedded course tutors, and test preparation workshops. In total, the PTC supports over 50 individual courses at the university.

Many of the students seen by the PTC received Starfish™ notifications. Laskey and Hetzel (2011) noted a positive correlation between students seeking academic resources such as tutoring and increased academic satisfaction and GPA. Monitoring usage and pilot studies of the student support network and Starfish™, the PTC is a critical component of ECU's early alert mechanism (E. Coghill, personal communication, 2014). In addition to faculty and advising follow-up, the PTC staff aggressively contacts students who receive academic concern notifications to invite students to individual assessment and study skills consultations along with course-specific tutoring.

Morrow and Ackerman (2012) found that students who perceived their home institution as embracing their academic future and offering support services increases motivation to seek resources and persist. Although a gap exists in retention rates at ECU when comparing students by gender and ethnicity, the gap is virtually non-existent for students who attend student support services such as tutoring (see Table 10).

Table 10

Retention Rates at East Carolina University for First Time Full Time Freshmen: Fall 2012

Cohort

FTFT 2012 Retention by:	Fall 2012 to Spring 2013	Fall 2012 to Fall 2013
Total Cohort Retention Rate	94.0	80.9
Female Retention Rate	94.1	83.9
Male Retention Rate	93.9	76.4
Female + Tutoring	94.2	85.0
Male + Tutoring	97.1	84.9

Note. *Numbers represent percentages. Source: East Carolina University Academic Advising and Support Center/Pirate Tutoring Center.

Of the fall 2012-2013 academic year, 41.6% of faculty on ECU's campus used the Starfish™ system at least once. Trends in the usage patterns show that newer faculty used Starfish™ more than senior faculty. Additionally, as faculty rank rose, Starfish™ usage followed. Over 87% of faculty agreed that Starfish™ notifications were effective with 85% feeling that sending an academic difficulty notification would begin a conversation with the struggling student. Of faculty surveyed, 81% believed Starfish™ usage in their course was helpful to communicate with students, since many faculty find students are hesitant to attend office hours on their own initiative. Additional research interest exists for students who have received more than one academic difficulty notification at a time. Specifically, students with three or more active flags at once could signify catastrophic situations in the student's life preventing them from meeting course and university expectations.

Following academic policy, ECU students are permitted four course drops to be used up to the 50% point of the academic semester (ECU Undergraduate Catalog, 2014). Starfish™ alerts provide students, faculty, and advisors with in-time course performance information. This information affords appropriate ability for students to consider staying in courses or the potential of withdrawing from courses. Advisors are able to communicate with students through early alert follow-up strategies to diagnose difficulties with courses, provide linkages to campus resources, and remind students of drop deadlines. In many situations, decisions of whether to drop a course can mean success or failure for students. Given the academic rules and regulations, preventing students from academic probation or suspension by utilizing strategic course drops is another positive aspect of the communication spurred by Starfish™ and the student support network. The benefits associated with implementation of Starfish™ and student support network are abundant. The system provides early feedback for timely advisor and network intervention and

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promotes communication between faculty, students, and campus resources. Structurally, the support network allows for targeted communication and outreach from tutoring and other support services to students displaying at-risk performance. Starfish™ also facilitates more honest conversations amongst faculty, advisors, network resources, and students, fostering stronger relationships and increasing connections to campus and its resources (Simons, 2011).

One of the most effective partnerships on ECU's campus is the student support network, held together by the Starfish™ early alert system that includes proactive collaboration among faculty, academic advisors, and student support services on campus. The intentionality of the student support network and utilization of Starfish™ have created a tangible retention strategy for the campus which is seen as a model within the UNC system (J. Geissler, personal communication, 2014). Additionally, ECU's implementation, training, and usage of Starfish™ as a development component of the student support network have garnered system, region, and national attention. Representatives from campus have been invited to publish research findings, share installation strategies with potential Starfish™ users, and present at local, state, and national conferences and conventions. The ECU model is even included in large grant applications.

Specifically, ECU representatives have presented on the Starfish™ implementation and research findings related to Starfish™ usage at National Academic Advising Association (NACADA) regional and national conferences and at the 7th and 8th Annual Consortium for Student Retention Data Exchange National Symposium on Student Retention (Hayes, 2011; Whalen, 2012). The student success network model was also shared at the 2014 Designing Early Alert Systems for At-Risk Students conference, hosted by Academic Impressions, and presenters

served as instructors to guide conference attendees interested in developing an early alert system on their campus.

ECU's model, although respected and seemingly structurally sound, lacks longitudinal empirical data to support its direct impact on student retention and graduation. Like most early alert systems and retention initiatives in general, the ECU model struggles to quantify a worthwhile return on investment due to its short existence. Conducting empirical research on Starfish™ and monitoring data associated with the student support network are needed to quantify the institutional value of student persistence. Furthermore, the literature does not touch on student perception of such systems. It is imperative to determine overall satisfaction for such support networks to correlate usage with increased student persistence.

Participants

Participants in this study are undergraduate students enrolled at ECU during the summer and fall 2014 academic semesters. While total enrollment hovers around 27,000 (N = 27,000) students, the undergraduate student population consistently remains at approximately 21,000 (N = 21,000) (East Carolina University Fact Book 2012-2013, n.d.). The typical freshman class enrollment is approximately 4,000 (N = 4,000); however, fluctuations in class size throughout the undergraduate population exist due to transfer students and attrition. All undergraduate students enrolled in the summer and fall 2014 semesters will be invited via email to participate in this survey research project. Upon completion of the survey period and collection of data, an analysis of the descriptive characteristics of the sample was conducted to statistically examine the results, statistically.

The study examines the perception of early alert system usage by all undergraduate students at ECU. The target population of this study is the total undergraduate student

enrollment; however, sub-units including individual student respondents, race, gender, class, major, grade point average (GPA), and academic status were also stratified for data analysis. The target population of 21,000 (N = 21,000) was selected to yield higher response rates in order to provide an increased opportunity for data analysis to extrapolate commonalities of survey responses.

Instrumentation

The construction of the survey instrument (see Appendix A) was completed in collaboration with the ECU Academic Advising and Support Center as a means to understand student attitudes of the Starfish™ Retention Solutions System. Furthermore, survey items were incorporated into the survey design as well as items using a Likert scale. Instrumentation for this survey research study was conducted using ECU Qualtrics online survey software. Utilization of this software provided students accessibility to complete the survey, as well as downloadable results for data analysis, ensuring participant anonymity. Survey items paralleled national surveys regarding student satisfaction, motivation, and sense of belonging. Items addressing connection to campus and student satisfaction were adapted from the FYI, a well-documented and used assessment for student development professionals.

Survey instrument items were also included to offer respondents the ability to self-report actions taken in response to instructor notifications via the early alert system. Additionally, the same survey item options were included to assess respondent self-reported actions in response to academic advisor follow-up communication. Student response options for both instructor notification and advisor follow-up communications included:

1. Responded via email

2. Made an appointment with my instructor

3. Made an appointment with my academic advisor

4. Communicated with my instructor in person

5. Altered my habits

6. Visited the Pirate Tutoring Center

7. Changed majors

8. Took no action

9. Other

To afford respondents the opportunity to expound upon specific responses not included in the existing survey options, a section to accommodate open-ended statements was also incorporated. This open-ended portion connect to the other survey option. Here, respondents noted additional actions taken in response to instructor and advisor communication through the Starfish™ system.

Instrument Validity and Reliability

Through focus group and expert evaluation, The Policy Center on the First Year of College, insures that the FYI survey meets face, convergent, and divergent validity (Porter & Swing, 2006). EBI utilized Cronbach's Alpha to determine reliability of the FYI instrument, producing factors > 0.80. The NSSE is a widely-used survey on student engagement that holds internal consistency and temporal stability as forms of reliability and high levels of response process, content, concurrent, consequential, and predictive validity (NSSE, 2013). The psychometric properties of NSSE have been extensively tested and widely reported (Kuh, Hayek, Carini, Oiumet, Gonyea, & Kennedy, 2001; Kuh, 2004). Pike (2013) suggests that the NSSE benchmarks provide dependable measures that are related to important indicators of quality and effectiveness at the college institutional level and are adequate and appropriate measures of student engagement for the purposes of assessment and evaluation. Items related to the IMI are

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supported as valid and reliable through studies examining motivation (McAuley, Duncan, & Tammen, 1989; Tsigilis & Theodosiou, 2003). Specifically, Leng, Baki, and Mahmud (2010) determined the IMI to have a Cronbach's Alpha reliability value of .844. These factors provide support that the survey items signify validity and reliability.

Due to segmented instrument construction, content validity for the survey instrument was established through a panel of three experts in the student engagement, enrollment, and development field. The experts offered their professional opinion and utilized their expertise regarding the importance and relevance of the items included in the survey instrument. Dr. Jayne Geissler, Executive Director for Retention Programs and Undergraduate Studies at East Carolina University, Dr. Travis Lewis, Director of Student Safety and Services at East Carolina University, and Mr. John Trifilo, Associate Director of the Pirate Tutoring Center at East Carolina University and Coordinator of the Starfish™ Early Alert System.

Within the survey instrument, three constructs were present. Each individual survey item linked to a thematic area based on research questions, including sense of belonging, educational satisfaction, and motivation. To determine internal consistency and reliability, the survey items within the constructs were analyzed to determine reliability coefficient. The collective sense of belonging Cronbach's Alpha was .843, showing appropriate evidence of consistency. For items included in the educational satisfaction construct, Cronbach's Alpha was .925. Survey items within the motivation construct possess a Cronbach's Alpha of .939. In Table 11, the Cronbach's Alpha for each portion of the survey are indicated.

To ensure instrument reliability a pilot study was conducted during the second summer semester 2014. Specifically including students who had readmitted to the university with deficient cumulative GPAs, the pilot returned results that bolstered instrument reliability. With

Table 11

Cronbach's Alpha Statistics for Starfish™ Survey Constructs

Survey Construct Category	Cronbach's Alpha
Sense of Belonging	.843
Satisfaction	.925
Motivation	.939

Cronbach's Alpha scores listed in Table 11, the Starfish™ survey administered in this study fell into the acceptable range for internal validity.

In sum, the survey is a valid and reliable instrument to measure the attitudes of students regarding the Starfish™ early alert system at ECU. While the survey is an appropriate measure of the perceptions of students investigated within this study, use of the survey outside of the current sample is limited. However, the Starfish™ survey was an acceptable means of data collection for this study.

Data Collection and Preparation

During fall 2014, undergraduate students enrolled at ECU will be invited to complete a self-administered online survey. The survey will be conducted during the summer semester due to fact that fall enrollment exceeds all other semester enrollment, thus increasing potential rate of response. Additionally, students will be reminded to participate the survey multiple times during the semester in order to increase the rate of response. Data will be extracted for analysis directly from the ECU Qualtrics online survey software. Survey results will not incorporate identifiable student information, protecting anonymity and upholding the Federal Education Rights and Privacy Act. Institutional data used in this study was procured from the Office of Undergraduate Admissions, Office of the Registrar, and IPAR.

<div align="center">

Data Analysis

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The Statistical Package for the Social Sciences (SPSS) version 22.0 will be utilized to interpret and analyze data collected by this study. Due to the cross-sectional nature of the survey instrument, survey responses were analyzed gauging student perspectives related to early alert systems. Multiple demographic characteristics, including class, gender, race, academic status, major, age, and grade point average were considered. Statistical analysis was conducted to

determine if significant differences existed regarding the dependent variables of student satisfaction, motivation to seek resources, and student sense of belonging, based on the independent variables of demographic population identifiers.

Descriptive statistics will be generated for each item on the survey instrument in response to the research questions. These descriptive statistics include the mean scores and frequency distributions of student responses. Information from the survey results will be entered into SPSS statistical software to determine significance through frequency, chi-square, crosstabulation, t-test, analysis of variance (ANOVA), and post-hoc outputs to analyze data for descriptive trends. Demographic information reported by participants will also be analyzed and reported. Information including students' majors, gender, race, age, GPA, enrollment population status, and classification will be examined through data analysis to investigate any correlations, trends, and significant differences within those indicators.

Statistical analysis will be conducted to determine if there are any associative relationships between the dependent and independent variables. The SPSS software will be used to perform the analyses of the participants' responses, due to the dynamic nature of the software and its ability to deal with large data sets with data extraction capabilities. Any associative relationships between student opinion of Starfish™ early alert system usage and students' major, race, age, enrollment population status, GPA, and classification will be determined through the utilization of descriptive statistics, t-test, chi square, one way ANOVA, and post-hoc analyses.

Threats to Validity

This research study presents threats to validity. Threats to internal validity compromise the ability for the research study to claim that a relationship exists between independent and dependent variables. A threat to internal validity in this study is the maturation of students during

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the semester. Specifically, first-time, full-time freshmen students experience great transitional development in their first semester of college. These experiences could affect student perception of early alert systems within a fall semester. Internal threats to validity including history, selection, mortality, testing, instrumentation, contamination, and statistical regression were not present in this one group design research study.

Threats to external validity compromise the confidence of the research study to claim whether results are applicable and generalizable to and across other individuals, settings, and times. Volunteer bias may provide a distinct issue, as students who volunteer to complete the online survey may not have the same characteristics as the general undergraduate population. Population validity is a definite consideration for this study, because the sample at ECU could differ on the basis of admissible characteristics, geographic location, and academic competence. It is also important to consider that the demographic characteristics and institutional size could provide generalizations across higher education institutions. The population of undergraduate students would be the only comparable context for this study. Another threat to external validity could be ecological in nature, meaning that institutions may not be similar; therefore, the generalizability may be limited when applied to other contexts.

This study protected student rights and privacy through anonymous survey completion; therefore, no intentional experimenter bias is present. It is possible; however, that experimenter bias could be evident through choices and directional predictions made during this or future studies. Protecting against threats to internal and external validity are important considerations for academic research in order to validate the conclusions of studies. Highlighting such threats to validity allows this research to be viewed through a comparable lens when applied to similar institutions of higher education.

Limitations

There are several limitations to this study. First, the setting of this research study excluded other institutions. Including other colleges and universities would have been beneficial and could have provided further insight into other student populations and could potentially have increased the generalizability of the results. However, this research design increased the relevance of the study to the institution. Due to the institution's status as a "super user" of the Starfish™ Early Alert System, the decision to use one university as the sample population was warranted (D. Yaskin, personal communication, September 15, 2012).

Second, this study includes only undergraduate students. The exclusion of graduate students prevented their responses from analysis considerations. However, the inclusion of graduate students in this study may have decreased the overall generalizability of findings, since not all institutions enroll graduate students. Also, that population may have different characteristics from undergraduates, that data would not be comparable when measured against undergraduate degree-seeking students.

The third limitation relates to the fact that faculty members at ECU are not required to participate in the Starfish™ system. Although many academic departments strongly encourage faculty to utilize the process, it is not a requirement. As such, students are not provided equal notifications across their enrolled courses.

Summary

Student development and engagement theories suggest that students who experience structured opportunities for individual growth form stronger connections to peers, faculty, and the institution. To assist in the transition to college life, deliberate institutional attempts to link students to campus resources are at the forefront of retention and graduation initiatives. The

purpose of this study was to investigate student perception of the usage of an early alert system in respect to motivation to seek resources, connection to the campus, and satisfaction with educational experiences.

Bridging connections between students, faculty, academic advisors, and other campus resources, ECU's adoption of Starfish™ Retention Solutions is a direct student attrition defense mechanism. In addition to numerous retention-focused initiatives on campus, the early alert system attempts to foster a sense of belonging for students, to perpetuate the idea that the institution cares about their academic success. Since early warning and alert systems are designed to provide opportunities for timely intervention, whether positive or negative reinforcement of academic performance, and student development theories support increased student-campus connection, it was expected that student perceptions of early alert system usage would be positive.

CHAPTER 4: RESULTS

Postsecondary institutions are increasingly exploring and changing strategies that promote student engagement and academic success. With this commitment to allocating resources to retain and graduate students is the concern of maintaining high quality programs that effectively reach students. This study explores specific feelings students possess of the early intervention process at East Carolina University during the fall 2014 academic semester.

The purpose of this study was to discover and examine student perceptions of early alert and intervention system Starfish™ usage at ECU. Through analyzing demographic, attitudinal, and open-ended questions, an understanding of those factors that guide student opinion of the Starfish™ system was investigated. The study, based on survey research, addressed four research questions and one null hypothesis. The purpose of this chapter is to report the findings from this research. Results are reported in the following sections of the chapter and provide a comprehensive summary of results of the analyses described in chapter three.

Participants

All undergraduate students at ECU during the fall 2014 academic term were included in the invitation to participate in this study. The total undergraduate enrollment during the fall 2014 academic semester was 21,437. A link to the web-based survey was sent to all undergraduate students matriculating in the fall term. Following the initial invitation to complete the survey, two reminder emails were disseminated at the beginning of the second and third weeks to encourage participation and improve response rate. This procedure and reminder pattern was in line with best practices for online survey methodologies (Dillman, Phelps, Tortora, Swift, Kohrell, Berck, & Messer, 2009; Floyd & Fowler, 2009; Peytcheva & Groves, 2009). During the three week period of survey administration, 4,658 (22% of total undergraduate population)

individual student surveys were attempted. Of the attempted surveys, 3,741 (80% of total responses) were deemed complete and 917 (20% of total responses) were considered incomplete, lacking entire survey response completion. Completion was determined and calculated by the ECU Qualtrics online survey software based on the number of answered survey items.

Conducted online, the survey consisted of items that were based on consistently conducted national surveys in higher education. Items addressed interaction, satisfaction, motivation, and other perceptions related to usage of the Starfish™ system at ECU. The instrument included eight items to request demographic data from students. Two survey items specifically requested information on actions taken by students in response to faculty and academic advisor notifications. Students were given a five-point Likert scale for answering nineteen survey questions with responses ranging from 1 (strongly disagree) to 2 (somewhat disagree) to 3 (neutral) to 4 (somewhat agree) 5 (strongly agree). The survey also included 3 open-ended items soliciting student input regarding perceived strengths and weaknesses of the Starfish™ system.

Qualitative student input within the open-ended questions was analyzed by method of populating for consistency. This method was employed to identify student perceptions of strengths and weaknesses of the early alert system at ECU. Existing trends are reported in this chapter.

<center>**Descriptive Analysis of Data**</center>

The Statistical Package for the Social Sciences (SPSS) 22.0 was utilized to analyze the data. Chi-square, t-test, one-way Analysis of Variance (ANOVA), and post-hoc comparisons, involving collective tests of the survey results (Green & Salkind, 2005), were used to analyze data and to determine trends and if significant findings existed.

Descriptive and frequency analyses were included to examine the overall survey population, including the representation of subcategories, mean, standard deviation, and other descriptive data points. A p-value of .05 was used to determine statistical significance for all applicable tests conducted. Where applicable, a Pearson Correlation Coefficient is used at the 0.01 level. The descriptive and frequency statistics included responses from 4,658 undergraduate students enrolled at ECU during the fall 2014 academic semester. The initial data analysis included overall and sub-categorical representation.

The descriptive data and analysis confirmed few outliers were present and a visual representation of plots confirmed linearity and normal distribution of survey responses. Crosstabulation analysis of the data was also incorporated to provide a detailed breakdown on the survey sample included in this study. Initial data testing also included cleaning the data file for any corrupt or malformed data points.

Survey participants were asked to self-report demographic information including gender, age, race/ethnicity, gender, intended major, cumulative GPA, and student classification. Of the total 4,658 respondents, 3,196 self-reported that they were female (70% of total respondents) and 1,403 as male (30% of total respondents). Participants in the study ranged in age from 16 to 64 and the average age of respondents was 21. The most frequent reported age was 18 and median age was 20, with a standard deviation of 4.72. These statistical numbers are representative and consistent with traditional college enrollments nationally and at ECU.

Of the 4,575 (98% of total respondents) students who answered the race/ethnicity question, 814 (18%) self- reported as African-American, 168 (3%) as Asian-American, 3,152 (69%) as Caucasian, 203 (4%) as Hispanic-American, 202 (4%) as Multiracial, and 36 (1%) as Native American. Due to limited number of respondents representing Asian American, Hispanic

American, Multiracial, and Native American, responses from these student race/ethnicities were consolidated in a new category recorded as Other, encompassing 609 respondents (13%). Therefore, for data analysis, race/ethnicity was indicated as African-American, Caucasian, or Other. Descriptive statistics for the total breakdown of respondent's race/ethnicity responses can be found in Table 12.

A total of 4,605 students (99% of total respondents) self-reported their current student classification. Included in the student classification question responses, 1,217 (26%) considered themselves freshmen, 963 (21%) as sophomores, 1,107 (24%) as juniors, and 1,318 (29%) as seniors. There was an even distribution across all student classification levels. Table 13 includes the classification breakdown of the study participants.

Crosstabulation analysis of the data was included to provide detailed perspective on the sample involved in this study. To provide a more comprehensive exploration of descriptive specifics of the sample's demographic populations, Table 14 highlights interconnectivity of gender, race/ethnicity, and student classification. Specifically, demographic characteristics are listed with number of respondents representing those groups and accompanying percentages within the population.

Respondents were also asked to indicate membership in specific student populations. Students responses totaled 4,657 (99% of total respondents) for the student population survey item. Student populations groups consisted of On-campus, Distance Education/Online, Transfer, Honors Program, and Student Athlete. Included in the student population question responses, 3,224 (70% of total respondents) self-reported themselves as On-Campus, 672 (14% of total respondents) as Distance Education/Online, 768 (16% of total respondents) as Transfer, 145 (3% of total respondents) as Honors Program, and 178 (4% of total respondents) as Student Athlete.

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Table 12

Respondent Race/Ethnicity

Race/Ethnicity	N	%
African-America	814	18
Asian-American*	168	3
Caucasian	3152	69
Hispanic-American*	203	4
Multiracial*	202	4
Native American*	36	1
Total	4574	98

Note: * = Combined into Other category for data analysis.

Table 13

Respondent Classification

Self-Reported Classification	N	%
Freshmen	1217	26
Sophomore	963	21
Junior	1107	24
Senior	1318	29
Total	4605	99

Table 14

Frequency Statistics of Student Populations

Demographic Characteristic	Males	%	Females	%
Race/Ethnicity				
African-America	233	29	573	71
Caucasian	951	30	2193	70
Other	205	34	399	66
Classification				
Freshman	402	33	807	67
Sophomore	268	28	694	72
Junior	331	30	772	70
Senior	403	34	910	66

	Freshman (%)	Sophomore (%)	Junior (%)	Senior (%)
Race/Ethnicity				
African-America	219(27%)	182(22%)	175(22%)	236(29%)
Caucasian	824(26%)	634(20%)	776(25%)	906(29%)
Other	205(28%)	139(23%)	140(23%)	161(26%)

Participants were permitted to select any applicable student population group, including multiple memberships. A complete breakdown of student responses regarding membership in specific student populations is included in Table 15.

In regards to cumulative GPA, 3,955 (85% of total respondents) students entered an answer on the survey instrument for their self-reported GPA. After 263 (6% of total answers) faulty data points were removed, 3691 (93% of total answers were deemed acceptable for data analysis. An average GPA of 3.07 existed for the survey population, with the lowest GPA reported being a cumulative 0.0 and highest a 4.0. The median score for the respondents was a 3.2 cumulative GPA with a mode of 3.0. The standard deviation of self-reported cumulative GPA was 0.74. For data analysis purposes, cumulative GPA was stratified into three groups; a lower tier, 0.0-1.99, a middle tier, 2.0-2.99, and an upper tier, 3.0-4.0. GPA groupings are represented in Table 16.

The survey instrument also investigated the number of Starfish™ notifications, positive or negative, students had received during the fall 2014 academic semester. The survey item regarding notifications received specifically requested that students indicate the number of notifications they had received on a scale. Students could report that they had received one, two, three, four or more, or no notifications. A total of 4,587 (99% of total respondents) students provided responses to the question. Table 17 directly reports the student responses to how many Starfish notifications were received up to the survey administration during the fall 2014 academic semester.

Table 15

Respondent Self-Report of Student Population Membership

Student Population	Responses	%
On-Campus	3224	70
Distance Education/Online	672	14
Transfer	768	16
Honors	145	3
Student Athlete	178	4
Total	4657	107

Table 16

Respondent Self-Report of Cumulative Grade Point Average (GPA)

GPA Range	N	%
0.0 – 1.99	164	4
2.0 – 2.99	1089	30
3.0 – 4.0	2435	66

Table 17

Respondent Self-Report of Number of Notifications Received

Number of Notifications Received	N	%
One Notification	978	22
Two Notifications	887	19
Three Notifications	507	11
Four or More Notifications	656	14
No Notifications	1559	34
Total	4587	99

A total of 381 (8% of total respondents) students included responses for the survey item regarding action taken linked to the instructor-initiated notifications. Self-reported student actions such as dropping courses, utilizing campus resources, informing parents and family of performance, and discussing performance with peers were present. Many student responses in the open-ended section tied to instructor notifications cited emotional responses associated with positive and negative notifications. Mentioned were feelings of pride, disappointment, accomplishment, determination, confusion, appreciation, anxiety, and motivation related to receiving instructor notifications through the Starfish™ early alert system.

In addition, respondents detailed other actions taken as a result of instructor notifications through open-ended responses, which were requested for students indicating other for actions taken as impacted by academic advisor follow-up. In fact, more students provided open-ended feedback of their course of action taken in response to academic advisor follow-up than instructor communication. A total of 438 (10% of total respondents) students self-reported taking an action not listed in the survey options provided. Overall, 57 more students provided statements of other actions taken as a result of advisor follow-up compared to those who took action based on instructor notifications.

As with instructor notification action, respondents who provided feedback cited similar emotional responses. Conversely, a large majority of students self-reported that advisor follow-up was nonexistent for positive and negative notifications. Interestingly, half of respondents reported taking no action in response to instructor and advisor communication. A complete breakdown of actions taken by respondents as a result of instructor communication and academic advisor follow-up, along with a comparison of the two contact methods, is provided for review in Table 18.

Table 18

Action Taken by Respondents in Response to Instructor and Advisor Starfish™ Notifications

Response to Notification/Follow-Up	Notification Responses	%	Follow-Up Responses	%	Difference
Responded via email	629	14	530	11	99
Appointment with instructor	269	6	128	3	141
Appointment with advisor	168	4	231	5	63*
Direct communication with instructor	337	8	146	3	191
Altered habits	788	17	446	10	342
Visited Pirate Tutoring Center	310	7	142	3	168
Changed majors	45	1	44	1	1
Took No Action	2342	50	2239	48	103
Other	507	11	637	14	130*

Note. * = Instances where response to advisor follow-up surpassed instructor notifications.

To provide a concise method to analyze data, student responses to instructor notification and advisor follow-up were coded into a dichotomous grouping system. Specifically, the two groups included a group for no action taken and another group that indicated that an action was actually taken. Included in the action taken grouping were all survey responses subtracting the *took no action* response option. To offer an overview of the consolidated self-reported student responses to instructor notifications, 3,053 (57% of total responses) actions were taken as a result of instructor notifications via Starfish, while 2,342 (43% of total responses) reported no action was taken. In comparison, 2,304 (51% of total responses) actions were taken as a result of advisor follow-up with 2,239 (49% of total responses) responses noting no action was taken. Succinctly put, more students report taking action as a result of instructor notifications compared to follow-up from academic advisors.

Survey participants were asked to indicate, through Likert scaled options, to what degree they agree with statements regarding Starfish™ usage at ECU. Likert options were provided to allow respondents to express their opinions and ranged from strongly disagree, somewhat disagree, neutral, somewhat agree, and strongly agree. Additionally, differences in means and standard deviation for student response to survey items concerning beliefs on the Starfish™ system were also included. Descriptive data indicated that knowledge of the early alert system usage and early intervention system structure was lacking. Furthermore, students indicated that benefits do exist to early alert system implementation, but the inconsistencies in instructor and advisor practices prove problematic to the overall effectiveness.

To aid in data analysis, reverse coding for the Likert scale was completed. Existing in the original survey form, the scale ranged from 1, *strongly agree*, to 5, *strongly disagree*. Inversion of the Likert scale produced 1, *strongly disagree*, to 5, *strongly agree*. As such, *neutral* responses

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were not impacted by this inversion. All references to survey items utilizing Likert scaled responses are included within the context of the reverse coding herein. Descriptive data for student responses to survey items in question fifteen regarding Starfish™ are provided in Table 19.

Another survey item, question sixteen, sought to procure specific beliefs students held concerning Starfish™ on campus. Also using Likert scaled responses, the survey item included options for students that spoke to how they feel the system works to accomplish development of certain competencies, skills, and actions. Descriptive data for student responses to survey items in question sixteen regarding Starfish™ are provided in Table 20.

Survey items with Likert scaled response options were combined to provide easier examination. Appropriately, *strongly agree* and *somewhat agree* were combined under the *agree* categorical group and *strongly disagree* and *somewhat agree* were combined under the *disagree* categorical group. The combination of individual survey items produce more substantial opportunities for generalization. Responses for *neutral* were not impacted during the combination process and are reported as recorded.

Through the combination of Likert scaled responses, data analysis was conducted to investigate categorical representations of student opinions. Through answers provided, the majority of respondents indicated positive perspectives on the Starfish system at ECU. Further, the *agree* responses outweighed the sum of *neutral* and *disagree* responses. Explained in greater detail within appropriate constructs later in this chapter, adjusted Likert scaled survey items related to student opinions on Starfish™ provide a glimpse into overall findings. Only four (25% of total items) of the Likert scaled items garnered less than 50% *agree* responses. The four lowest items directly related to how students feel Starfish™ increases overall satisfaction of their

Table 19

Descriptive Statistics for Student Responses Regarding Starfish Usage: Question 15

Survey Item	Mean	SD
I believe Starfish helps students succeed	3.53	1.10
I benefit from instructors' use of Starfish	3.45	1.18
I benefit from follow-up from my academic advisor	3.50	1.12
I am more satisfied with my education due to the use of Starfish	3.16	1.19
I believe Starfish should be used by all instructors	3.63	1.17
I would be more satisfied with my education if Starfish was used in every course	3.42	1.21
Starfish notifications and advisor follow-up make me feel like someone cares about my success	3.75	1.13
I feel more connected to campus due to Starfish notification and advisor follow-up	3.30	1.21
Instructors who use Starfish care more about my success than those who do not	3.32	1.25

Table 20

Descriptive Statistics for Student Responses Regarding Starfish Usage: Question 16

Survey Item	Mean	SD
I believe that Starfish notifications motivate me to perform better in my courses	3.66	1.18
I believe that Starfish notifications help me build academic confidence	3.62	1.20
I believe that Starfish notifications help me better understand how I am doing in courses	3.78	1.16
I believe that Starfish notifications motivate me to seek assistance from my instructors	3.73	1.17
I believe that Starfish notifications motivate me to seek guidance from my academic advisor	3.42	1.20
I believe that Starfish notifications motivate me to seek campus resources like tutoring, etc...	3.52	1.19
I believe that Starfish notifications increase my motivation to remain enrolled at ECU	3.50	1.19

education, would improve overall satisfaction with their education if used in every course, makes them feel more connected to campus due to instructor notification and advisor follow-up, and that instructors who use the system care more about their success than those who do not.

As such, twelve (75% of total items) survey items were found to exceed 50% *agree* responses. Highest scoring include survey items that approached how well students believe Starfish™ notifications and advisor follow-up make them feel like someone cares about their success, motivates them to perform better in courses, better understand course progress, and build academic confidence. Even the four lowest scaled survey items resulted in higher *agree* responses than *neutral* or *disagree*.

Respondents were offered Likert scale to note how strongly they agreed or disagreed with survey statements, but were also afforded the ability to record a response of neutrality through the *neutral* response. As such, many student responses were neutral. Ranging from 22% to 35%, *neutral* encompassed a large portion of responses, diminishing the *agree* and *disagree* responses. Survey items with the highest *neutral* totals paralleled survey questions with the lowest *agree* totals. Further, survey items with the highest *disagree* totals follow the same modeling as expressed with *neutral* and *agree* responses. Richer descriptions and trends involved in Likert survey items exist in subsequent portions of this chapter. Comparisons of the combined Likert categories and associated percentages are presented in Table 21.

Sense of Belonging

This section is designed to investigate the first research question proposed in chapter one that sought to explore student perceptions of the Starfish™ early alert system related to the system increasing their sense of belonging to the institution:

Do students perceive early alert systems to increase their sense of belonging to campus?

Table 21

Combined Descriptive Statistics for Total Student Responses Regarding Starfish Usage

Survey Item	N	Agree*	%	Neutral	%	Disagree*	%
I believe Starfish helps students succeed	3829	2181	57	1021	27	630	16
I benefit from instructors' use of Starfish	3819	2044	54	1025	26	750	20
I benefit from follow-up from my academic advisor	3812	1905	50	1310	34	597	16
I am more satisfied with my education due to the use of Starfish	3810	1484	40	1341	35	985	25
I believe Starfish should be used by all instructors	3809	2202	58	1028	27	579	15
I would be more satisfied with my education if Starfish was used in every course	3814	1879	49	1167	31	768	20
Starfish notifications and advisor follow-up make me feel like someone cares about my success	3817	2426	64	909	23	482	13
I feel more connected to campus due to Starfish notification and advisor follow-up	3813	1701	45	1225	32	887	23
Instructors who use Starfish care more about my success than those who do not	3808	1813	48	1077	28	919	24
I believe that Starfish notifications motivate me to perform better in my courses	3816	2357	62	862	22	597	16
I believe that Starfish notifications help me build academic confidence	3817	2301	60	863	23	653	17

Table 21 (continued)

Survey Item	N	Agree*	%	Neutral	%	Disagree*	%
I believe that Starfish notifications help me better understand how I am doing in courses	3809	2511	66	784	21	514	13
I believe that Starfish notifications motivate me to seek assistance from my instructors	3810	2139	56	1023	27	648	17
I believe that Starfish notifications motivate me to seek guidance from my academic advisor	3811	1902	50	1120	29	789	21
I believe that Starfish notifications motivate me to seek campus resources like tutoring, etc…	3811	2061	54	1069	28	680	18
I believe that Starfish notifications increase my motivation to remain enrolled at ECU	3806	1967	51	1178	31	661	18

Note. * = Agree and Disagree represent combining of Strongly and Somewhat Agree and Strongly and Somewhat Disagree.

To gauge student perceptions of connectedness to the institution via a sense of belonging, a series of survey questions requested information on how well respondents believed Starfish™ and ECU's early intervention system infrastructure cultivated a feeling that they were a part of the campus environment. To analyze student opinion of sense of belonging through early alert system usage, an additional data variable was constructed from existing survey item results. Specifically, the following survey items were contained in the created variable and aimed to measure sense of belonging, a key component of intention to persist, related to the early alert system:

1. Starfish notifications and advisor follow-up make me feel like someone cares about my success.

2. I feel more connected to campus due to Starfish notification and advisor follow-up.

3. Instructors who use Starfish care more about my success than those who do not.

Overall, data provides evidence that respondents buy into to the fact that through developing connections on campus, Starfish™ plays a part in encouraging and increasing sense of belonging. Specifically, a large number of students reported that notifications from instructors and academic advisor follow-up communication made them feel like someone cared about their success. Further, students reported that they feel instructors who used Starfish™ in their courses may actually care more about their individual success than instructors who did not use early alert mechanisms. Results of survey items related to sense of belonging are presented in Table 22. To accompany Table 22 and further explain the sense of belonging construct in terms of individual and collective mean and standard deviation, Table 22 specifically displays the components of the construct.

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Table 22

Results of Survey Items Related to Sense of Belonging

Survey Item	Agree* (%)	Neutral (%)	Disagree* (%)
Starfish™ notifications and advisor follow-up make me feel like someone cares about my success	64	23	13
I feel more connected to campus due to Starfish™ notification and advisor follow-up	45	32	23
Instructors who use Starfish™ care more about my success than those who do not	48	28	24

Note. * = Agree and Disagree represent combining of Strongly and Somewhat Agree and Strongly and Somewhat Disagree.

To appropriately dissect and run statistical analyses, a total composite score was calculated for the sense of belong construct within this study. Comprised of survey items assigned to the construct theme, individual student responses were collected into the total composite score for the sense of belonging construct. In SPSS, a new variable was created to include each of the three survey items within the construct. The composite score was tabulated using unweighted scores from each individual respondent and reported in Table 23.

Educational Satisfaction

This section details the results of the second research question proposed in chapter one that sought to examine student perceptions of the Starfish™ early alert system related to its use increasing their level of educational satisfaction:

Does the use of early alert systems increase student satisfaction with their education?

Survey items were also included to estimate student perceptions of early intervention strategies in regards to impacts on satisfaction of their overall educational experiences. Satisfaction is an important consideration for students in their intention to remain in college. As such, to analyze student opinion of satisfaction of their educational experiences through early alert system usage, a data variable was constructed from existing survey items. Specifically, the following survey items were contained in the created variable designed to measure educational satisfaction related to the early alert system:

1. I believe Starfish™ helps students succeed.

2. I am more satisfied with my education due to the use of Starfish™.

3. I believe Starfish™ should be used by all instructors.

4. I would be more satisfied with my education if Starfish™ was used in every course.

5. I believe that Starfish™ notifications help me build academic confidence.

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Table 23

Descriptive Data Results of Survey Items Related to Sense of Belonging

Survey Item	Mean	SD
Starfish™ notifications and advisor follow-up make me feel like someone cares about my success	3.75	1.13
I feel more connected to campus due to Starfish™ notification and advisor follow-up	3.30	1.21
Instructors who use Starfish™ care more about my success than those who do not	3.32	1.25
Sense of Belonging Construct Total Average	3.45	0.20
Sense of Belonging Construct Composite Score	10.34	3.16

6. I believe that Starfish™ notifications help me better understand how I am doing in courses.

Respondents noted that Starfish™ does impact their level of satisfaction with their education. Further, Students reported that early alert system structure, combining instructor notifications and advisor follow-up, promotes better understanding of course progress, academic confidence, and student success. Respondents also believed that Starfish™ impact on satisfaction would be increased with all instructors utilized the system in all courses at the university. While students perceive Starfish™ to impact their satisfaction, they did not rank the early alert system as the most influential. Students believe Starfish™ helps bolster satisfaction, but does not represent the only factor in shaping their educational fulfillment. Results of survey items related to educational satisfaction are presented in Table 24. Table 25 supplants information presented in Table 25, outlining individual and collective mean and standard deviation for items within the educational satisfaction construct of this study.

As with the sense of belonging construct, a total composite score was also calculated for the educational satisfaction construct within this study. Comprised of survey items assigned to the construct theme, individual student responses were collected into the total composite score for the educational satisfaction construct. In SPSS, a new variable was created to include each of the three survey items within the construct. The composite score was tabulated using unweighted scores from each individual respondent and reported in Table 25.

Motivation to Access Institutional Resources

This section addresses the third research question proposed in chapter one that intended to appraise student opinions on the Starfish™ early alert system and determine if system usage

Table 24

Results of Survey Items Related to Educational Satisfaction

Survey Item	Agree* (%)	Neutral (%)	Disagree* (%)
I believe that Starfish™ notifications help me better understand how I am doing in courses	66	21	13
I believe that Starfish™ notifications help me build academic confidence	60	23	17
I believe Starfish™ should be used by all instructors	58	27	15
I believe Starfish™ helps students succeed	57	27	16
I would be more satisfied with my education if Starfish™ was used in every course	49	31	20
I am more satisfied with my education due to the use of Starfish™	40	35	25

Note. * = Agree and Disagree represent combining of Strongly and Somewhat Agree and Strongly and Somewhat Disagree.

Table 25

Descriptive Data Results of Survey Items Related to Educational Satisfaction

Survey Item	Mean	SD
I believe that Starfish™ notifications help me better understand how I am doing in courses	3.78	1.16
I believe that Starfish™ notifications help me build academic confidence	3.62	1.20
I believe Starfish™ should be used by all instructors	3.63	1.17
I believe Starfish™ helps students succeed	3.53	1.10
I would be more satisfied with my education if Starfish™ was used in every course	3.42	1.21
I am more satisfied with my education due to the use of Starfish™	3.16	1.19
Educational Satisfaction Construct Total Average	3.52	0.19
Educational Satisfaction Construct Composite Score	21.02	6.09

promotes an increased motivation to succeed and access student support resources on campus:

Do early alert notifications increase student motivation to utilize campus resources?

Investigation of student perceptions on how Starfish™ prompts students to feel more motivated to perform at a higher level and promotes action to seek campus support services was initiated by specific survey questions. As noted, students feeling motivated to succeed and form connections on campus are typically more likely to persist. Specifically, the following survey items were contained in the created variable designed to measure motivation to access institutional resources related to the early alert system:

1. I benefit from instructors' use of Starfish™.

2. I benefit from follow-up from my academic advisor.

3. I believe that Starfish™ notifications motivate me to perform better in my courses.

4. I believe that Starfish™ notifications motivate me to seek assistance from instructors.

5. I believe that Starfish™ notifications motivate me to seek guidance from my academic advisor.

6. I believe that Starfish™ notifications motivate me to seek campus resources like tutoring, etc...

7. I believe that Starfish™ notifications increase my motivation to remain enrolled at ECU.

Of all constructs tested within research questions, early alert system usage and its impact on students being motivated to perform better and seek institutional resources garnered the highest responses. Students reported that Starfish™ usage motivates them to perform better in courses, seek assistance from instructors, utilize campus resources such as tutoring, and seek guidance from academic advisors. Additionally, students noted benefits associated with

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instructor notifications and academic advisor follow-up in relation to their overall motivation in college.

Students also linked Starfish™ to their motivation to continue enrollment, citing early alert system presence as a link to educational motivation. Results of survey items related to motivation to access institutional resources are presented in Table 26. To support findings presented in Table 26, a complete listing of individual and collective survey instrument items combined in the motivation to access institutional resources construct is located for review in Table 26.

Continuing the trend established with the two other constructs, a total composite score was also calculated for the motivation to access institutional resources construct within this study. Comprised of survey items assigned to the construct theme, individual student responses were collected into the total composite score for the motivation to access institutional resources construct. In SPSS, a new variable was created to include each of the three survey items within the construct. The composite score was tabulated using unweighted scores from each individual respondent and reported in Table 27.

Differences Based on Demographics

This section extends the previous areas to investigate the fourth research question proposed in chapter one that worked to discover existing trends in student perceptions of the Starfish™ early alert system based on demographic information supplied from study participants:

Do differences exist in the perception of early alert systems based on demographics?

Table 26

Results of Survey Items Related to Motivation to Access Institutional Resources

Survey Item	Agree* (%)	Neutral (%)	Disagree* (%)
I believe that Starfish™ notifications motivate me to perform better in my courses	62	22	16
I believe that Starfish™ notifications motivate me to seek assistance from instructors	56	27	17
I believe that Starfish™ notifications motivate me to seek campus resources like tutoring, etc...	54	28	18
I benefit from instructors' use of Starfish™	54	26	20
I believe that Starfish™ notifications increase my motivation to remain enrolled at ECU	51	31	18
I believe that Starfish™ notifications motivate me to seek guidance from my academic advisor	50	29	21
I benefit from follow-up from my academic advisor	50	34	16

Note. * = Agree and Disagree represent combining of Strongly and Somewhat Agree and Strongly and Somewhat Disagree.

Table 27

Descriptive Data Results of Survey Items Related to Motivation to Access Institutional

Resources

Survey Item	Mean	SD
I believe that Starfish™ notifications motivate me to perform better in my courses	3.66	1.18
I believe that Starfish™ notifications motivate me to seek assistance from instructors	3.73	1.17
I believe that Starfish™ notifications motivate me to seek campus resources like tutoring, etc...	3.52	1.19
I benefit from instructors' use of Starfish™	3.45	1.18
I believe that Starfish™ notifications increase my motivation to remain enrolled at ECU	3.50	1.19
I believe that Starfish™ notifications motivate me to seek guidance from my academic advisor	3.42	1.20
I benefit from follow-up from my academic advisor	3.50	1.12
Motivation to Access Institutional Resources Construct Total Average	3.54	0.10
Motivation to Access Institutional Resources Construct Composite Score	24.49	6.09

Null Hypothesis One

There was no significant difference in the perception of students regarding early alert systems usage based on demographics. For this hypothesis, survey respondents were asked to indicate responses to demographic survey items. $H_0 1$ was rejected.

As earlier mentioned, respondent data was analyzed and reported based on basic demographics and survey constructs related to research questions one through three. This section bridges the previously presented findings by providing linkages between survey responses and demographic groupings. As a part of the exploratory analyses within the study, the student demographic characteristics were investigated to uncover if any relationships exist between student characteristics and their perceptions about Starfish™.

The demographic characteristics of gender, race/ethnicity, student classification, student population, and GPA were tested against survey questions related to number of notifications received, response to instructor notification, response to advisor follow-up, and constructs of sense of belonging, satisfaction, and motivation, as outlined in research questions one, two, and three. Table 28 specifically presents mean, standard deviation, and Pearson Correlation Coefficient as a result of bivariate correlation tests completed for demographic groups across the three constructs of this study.

In addition to statistical correlation analysis total composite scores for each construct were analyzed through a series of ANOVA tests to determine statistical significance between the demographic characteristics compared among the three constructs. Findings for the one-way ANOVA and independent-sample t-tests using the three constructs as dependent variables and demographic categories as independent variables suggested statistically significant interaction effects between groups. Presence of differences in means and composite scores supports the

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Table 28

Demographic Characteristics to Overall Construct Perceptions

Demographic Characteristic	Overall Belonging Mean(SD)	Overall Satisfaction Mean(SD)	Overall Motivation Mean(SD)
Gender			
Male	3.39(1.08)	3.45(1.04)	3.45(1.04)
Female	3.49(1.03)	3.56(0.98)	3.55(0.99)
Total Mean for Construct	3.44(1.05)	3.50(1.01)	3.49(1.01)
Pearson Correlation Coefficient	.039*	.047**	.043**
Race/Ethnicity			
African American	3.60(1.04)	3.70(0.95)	3.77(0.95)
Caucasian	3.42(1.05)	3.48(1.00)	3.49(1.02)
Other	3.47(1.02)	3.48(0.99)	3.50(1.02)
Total Mean for Construct	3.46(1.05)	3.53(1.00)	3.52(1.01)
Pearson Correlation Coefficient	-.040*	-.058**	-.086**
Classification			
Freshman	3.62(1.01)	3.67(0.95)	3.70(0.96)
Sophomore	3.48(1.05)	3.57(0.99)	3.56(1.00)
Junior	3.39(1.03)	3.46(1.02)	3.43(1.02)
Senior	3.35(1.07)	3.43(1.01)	3.39(1.02)
Total Mean for Construct	3.46(1.05)	3.53(1.00)	3.52(1.01)
Pearson Correlation Coefficient	-1.00**	-.096**	-.122**
Student Population			
On Campus	3.48(1.05)	3.54(1.00)	3.54(1.01)
Distance Education	3.44(0.97)	3.50(0.96)	3.46(0.95)
Transfer	3.46(1.01)	3.55(0.98)	3.53(1.00)
Honors	3.20(1.02)	3.21(0.91)	3.09(0.92)
Student Athlete	3.51(1.06)	3.53(1.00)	3.54(0.99)
Total Mean for Construct	3.41(1.02)	3.46(0.79)	3.43(0.97)

Note. * = Significant correlation at the 0.01 level (2-tailed).
** = Significant correlation at the 0.05 level (2-tailed).

rejection of the null hypothesis. Complete results of statistical analyses of the composite scores from the three constructs compared across demographic groups in presented in Table 29. As Table 29 displays, while most demographic groups remain consistent, male, African-American, and sophomore students indicated being more motivated through Starfish™. Further, Table 29 displays congruencies between total composite construct scores across demographic groups as expressed in Table 28 for total construct mean scores. These results support the rejection of the null hypothesis. Correlation takes into account the higher scores for such populations. Later tables will present demographic characteristics in more detail.

As a result of ANOVA tests, where significant difference between means existed, Tukey HSD was used as the post-hoc follow-up test for multiple comparisons within the constructs. Within the sense of belonging construct, there was a significant difference between groups at the p<.05 level. For student classification: [$F(3, 3803) = 13.52$, $p = .000$]. Post-hoc comparisons using the Tukey HSD test indicated that the mean score for freshmen (M = 10.85, SD = 3.03) was significantly different than the sophomores (M = 10.41, SD = 3.16), juniors (M = 10.15, SD = 3.12), and seniors (M = 10.03, SD = 3.24). There was also a significant difference between race/ethnicity: [$F(5, 3783) = 3.27$, $p = .006$]. Tukey HSD post-hoc test showed that the mean score for African-American students (M = 10.77, SD = 3.16) was significantly different than Caucasian (M = 10.23, SD = 3.16) and Other (M = 10.39, SD = 3.08). There was also a significant difference between gender: [$F(2, 3806) = 3.22$, $p = .040$]. Post-hoc testing resulted in significant difference between female (M = 10.43, SD = 3.10) and male (M = 10.16, SD = 3.26).

Succinctly, within the sense of belonging construct, comparisons between the individual groups produced the following findings. Within student classification, freshmen are not statistically significant with sophomores (p = .018), but are statistically significant with juniors

Table 29

Demographic Characteristics Comparison to Overall Construct Composite Scores

Demographic Characteristic	Overall Belonging Composite Score Mean(SD)	Overall Satisfaction Composite Score Mean(SD)	Overall Motivation Composite Score Mean(SD)
Gender			
Male	10.16(3.26)	20.57(6.32)	23.99(7.35)
Female	10.43(3.10)	21.24(5.97)	24.72(7.05)
Total Gender Score	10.29(3.18)	20.90(6.14)	24.35(7.20)
ANOVA P-value	0.04*	0.01*	0.01*
Race/Ethnicity			
African American	10.77(3.16)	22.08(5.82)	26.25(6.80)
Caucasian	10.23(3.16)	20.77(6.13)	24.04(7.15)
Other	10.39(3.08)	20.80(6.08)	24.46(7.23)
Total Race Score	10.35(3.16)	21.03(6.08)	24.51(7.14)
ANOVA P-Value	0.00*	0.00*	0.00*
Classification			
Freshman	10.85(3.03)	21.84(5.86)	25.77(6.79)
Sophomore	10.41(3.16)	21.34(6.00)	24.87(7.07)
Junior	10.15(3.12)	20.59(6.23)	23.89(7.29)
Senior	10.03(3.24)	20.48(6.14)	23.63(7.23)
Total Classification Score	10.35(3.16)	21.04(6.09)	24.51(7.15)
ANOVA P-Value	0.00*	0.00*	0.00*
Student Population	10.43(3.18)	21.11(6.09)	24.67(7.14)
On Campus	10.28(2.95)	20.93(5.82)	24.13(6.76)
Distance Education	10.33(3.06)	21.20(5.97)	24.60(7.10)
Transfer	9.58(3.08)	19.20(5.46)	21.58(6.42)
Honors	10.54(3.18)	21.09(6.19)	24.67(7.04)
Student Athlete	10.23(3.09)	20.70(5.90)	23.93(6.89)
Total Population Score			

Note. * = $p < 0.05$.

(p = .000) and seniors (p = .000). Sophomores are not statistically significant with juniors (p = .331) or seniors (p = .050) and juniors are not statistically significant with seniors (p = .833). Within race/ethnicity, African-American students are statistically significant with Caucasian (p = .001) students and not statistically significant with Other (p = .800) students. Caucasian students are not statistically significant with Other (p = .961) students. For gender, females and males are not statistically significant (p = .035).

The motivation to access institutional resources construct also produced significant differences between groups. For student classification: [F(3, 3812) = 19.32, p = .000]. Post hoc comparisons using the Tukey HSD test indicated that the mean score for freshmen (M = 25.77, SD = 6.79) was significantly different than the sophomores (M = 24.87, SD = 7.07), juniors (M = 23.89, SD = 7.29), and seniors (M = 23.63, SD = 7.23). There was also a significant difference between race/ethnicity: [F(5, 3792) = 10.53, p = .000]. Tukey HSD post-hoc test showed that the mean score for African-American students (M = 26.25, SD = 6.80) was significantly different than Caucasian (M = 24.04, SD = 7.15) and Other (M = 24.46, SD = 7.23). There was also a significant difference between gender: [F(2, 3815) = 4.32, p = .013]. Post-hoc testing resulted in significant difference between female (M = 24.72, SD = 7.05) and male (M = 23.99, SD = 7.35).

Specifically, within the motivation to access institutional resources construct, comparisons between the individual groups produced the following findings. For student classification, freshmen are not statistically significant with sophomores (p = .037), but are statistically significant with juniors (p = .000) and seniors (p = .000). Sophomores are not statistically significant with juniors (p = .025), but are statistically significant with seniors (p = .001). Juniors are not statistically significant with seniors (p = .844). Within race/ethnicity, African-American students are statistically significant with Caucasian (p = .000) students and not

statistically significant with Other (p = .227) students. Caucasian students are not statistically significant with Other (p = .859) students. For gender, females and males are not statistically significant (p = .010).

For the educational satisfaction construct, there were significant differences amongst groups, as well. For student classification: [F(3, 3817) = 11.39, p = .000]. Post hoc comparisons using the Tukey HSD test indicated that the mean score for the freshmen (M = 21.84, SD = 5.86) was significantly different than the sophomores (M = 21.34, SD = 6.00), juniors (M = 20.59, SD = 6.23), and seniors (M = 20.48, SD = 6.14). There was also a significant difference between race/ethnicity: [F(5, 3797) = 5.35, p = .000]. Tukey HSD post-hoc test showed that the mean score for African-American students (M = 22.08, SD = 5.82) was significantly different than Caucasian (M = 20.77, SD = 6.13) and Other (M = 20.80, SD = 6.08). There was also a significant difference between gender: [F(2, 3820) = 5.00, p = .007]. Post-hoc testing resulted in significant difference between females (M = 21.24, SD = 5.97) and males (M = 20.57, SD = 6.32).

Explicitly, within the educational satisfaction construct, comparisons between the individual groups produced the following findings. For student classification, freshmen are not statistically significant with sophomores (p = .310), but are statistically significant with juniors (p = .000) and seniors (p = .000). Sophomores are not statistically significant with juniors (p = .052) or seniors (p = .013). Juniors are not statistically significant with seniors (p = .979). Within race/ethnicity, African-American students are statistically significant with Caucasian (p = .000) students and not statistically significant with Other (p = .442) students. Caucasian students are not statistically significant with Other (p = .915) students. For gender, females and males are statistically significant (p = .005).

Crosstabulation was completed in order to decipher student population membership totals within demographic groupings. Demographic characteristics, sorted by student population membership, are outlined and displayed in Table 30. From information provided by respondents regarding specific notifications received, crosstabulation also provided stratification amongst demographic groups within the study. Normal distribution exists, however, respondent data highlights that as seniority increases, the number of Starfish™ notifications decreases. As such, self-reported number of notifications received is presented by demographic characteristics in Table 31.

To provide a concise method to analyze data, student responses to instructor notification and advisor follow-up were coded into a dichotomous grouping system. Specifically, a group for no action taken and a group that indicated an action was taken. Included in the action taken grouping were all survey responses minus the *took no action* response option. Table 32 offers an overview of the consolidated self-reported student responses to instructor notification and advisor follow-up stratified by demographic populations included in this study.

In relation to the construct associated with student opinions on whether Starfish™ promotes a sense of belonging, respondents noted that indeed the early alert system impacts their feelings of belonging to campus. Specifically, across all demographic populations was evidence that instructor notifications and advisor follow-up through Starfish™ produced feelings that someone on campus cared for their success, that they were more connected to campus, and that instructors utilizing the early system cared more for their success than instructors who did not. Overall, findings were consistent across demographic groupings. Additionally, in regards to difference across demographic populations, data analysis exhibits evidence that respondents believe Starfish™ builds a feeling of connection to the institution evenly. Table 33 illustrates the

Table 30

Demographic Characteristics to Self-Reported Student Population Membership

Demographic Characteristic	Total Responses (Total %)	On Campus (%)	Distance Education (%)	Transfer (%)	Honors (%)	Student Athlete (%)
Gender						
Male	1553(31)	971(63)	188(12)	268(17)	38(2)	88(5)
Female	3408(69)	2244(66)	475(14)	496(15)	106(3)	87(2)
Race/Ethnicity						
African American	890(18)	587(68)	113(12)	131(14)	9(1)	50(5)
Caucasian	3384(68)	2169(64)	476(14)	519(15)	116(4)	104(3)
Other	713(14)	468(66)	83(12)	118(17)	20(2)	24(3)
Classification						
Freshman	1274(26)	1148(90)	30(2)	12(1)	32(2)	52(5)
Sophomore	965(20)	620(65)	92(9)	161(17)	38(3)	54(6)
Junior	1186(23)	636(54)	205(17)	277(23)	34(3)	34(3)
Senior	1547(31)	813(53)	337(22)	318(20)	41(3)	38(2)

Table 31

Self-Reported Notifications Received by Demographic Characteristics

Demographic Characteristic	One Notification (%)	Two Notifications (%)	Three Notifications (%)	Four or More Notifications (%)	None (%)
Gender					
Male	282(20)	296(22)	152(11)	169(12)	489(35)
Female	691(22)	587(18)	354(12)	484(15)	1062(33)
Race/Ethnicity					
African American	173(21)	144(18)	95(12)	125(16)	268(33)
Caucasian	664(22)	611(19)	347(11)	442(14)	1071(34)
Other	135(22)	123(20)	60(10)	83(14)	207(34)
Classification					
Freshman	239(20)	243(20)	149(12)	231(19)	347(29)
Sophomore	210(22)	177(18)	109(11)	151(16)	310(33)
Junior	235(21)	202(18)	131(12)	149(14)	378(35)
Senior	290(22)	264(21)	116(8)	121(9)	521(40)
Student Population					
On Campus	706(22)	638(20)	371(11)	487(15)	1017(32)
Distance Education	143(22)	109(16)	58(9)	73(11)	278(42)
Transfer	181(24)	151(20)	74(10)	93(12)	266(34)
Honors	28(19)	23(16)	11(8)	24(17)	59(40)
Student Athlete	38(21)	35(20)	19(11)	17(10)	68(38)

Table 32

Action Taken by Demographics in Response to Instructor and Advisor Starfish™ Notifications

Demographic Characteristic	Instructor Notification Action Taken (%)	Instructor Notification No Action Taken (%)	Advisor Follow-Up Action Taken (%)	Advisor Follow-Up No Action Taken (%)
Gender				
Male	928(58)	665(42)	712(53)	635(47)
Female	2106(56)	1662(44)	1589(50)	1580(50)
Race/Ethnicity				
African American	697(67)	351(33)	537(61)	345(39)
Caucasian	1873(53)	1669(47)	1405(47)	1589(53)
Other	447(60)	303(40)	338(54)	290(46)
Classification				
Freshman	852(61)	548(39)	606(53)	546(47)
Sophomore	683(60)	462(40)	518(54)	446(46)
Junior	702(55)	569(45)	519(49)	548(51)
Senior	806(52)	750(48)	656(49)	689(51)
Student Population				
On Campus	2197(57)	1674(43)	1618(50)	1611(50)
Distance Education	380(53)	335(47)	324(52)	302(48)
Transfer	681(67)	336(33)	504(61)	326(39)
Honors	59(37)	101(63)	49(36)	86(64)
Student Athlete	124(60)	82(40)	100(54)	84(46)
GPA				
0.0 - 1.9	158(72)	60(28)	166(73)	63(27)
2.0 – 2.9	902(65)	485(35)	692(59)	475(41)
3.0 – 4.0	1337(49)	1409(51)	1025(44)	1306(56)

Table 33

Demographic Results of Survey Items Related to Sense of Belonging Construct

Demographic Characteristic	Someone Cares			Connected to Campus			Instructors Care More		
	Agree	Neutral	Disagree	Agree	Neutral	Disagree	Agree	Neutral	Disagree
Gender									
Male	68	19	13	57	24	19	59	21	20
Female	67	22	11	55	27	18	58	23	19
Race/Ethnicity									
African American	67	22	11	54	28	18	57	23	20
Caucasian	68	21	11	55	26	19	58	23	19
Other	65	25	10	55	24	21	58	22	20
Classification									
Freshman	66	23	11	55	26	19	57	24	19
Sophomore	68	21	11	53	27	20	57	23	20
Junior	68	20	12	56	24	20	59	22	19
Senior	69	21	10	56	27	17	59	23	18
Student Population									
On Campus	68	21	11	55	26	19	58	22	20
Distance Education	70	21	9	56	27	17	58	23	19
Transfer	69	19	12	56	25	19	59	21	20
Honors	60	22	18	53	25	22	52	22	26
Student Athlete	68	20	12	55	25	20	58	28	14
GPA									
1.0 - 1.9	73	9	18	61	13	26	61	12	27
4.0 – 2.9	72	15	13	54	25	21	60	18	22
5.0 – 4.0	66	24	10	55	27	18	57	25	18

dispersion of survey items through a demographic characteristic lens tailored to the sense of belonging construct.

Survey items compiled to form the educational satisfaction construct directly sought to address student opinions on how Starfish™ usage impacts how they feel about their education at ECU. Further, respondents provided feedback based on their perceptions of the early alert system structure on campus to report how well Starfish™ helps them understand progress in courses, build academic confidence, and succeed in college. Additional survey items within the construct aimed to discover opinions on whether students believed Starfish™ should be used by all professors in all courses. A final question directly asked students to gauge whether they are more satisfied with their education based on early alert system usage. As with the first construct, the educational satisfaction construct represent even comparisons across demographic groupings. Table 34 offers a complete report based on demographics groupings within the educational construct.

Survey items assembled to form the motivation to access institutional resources construct targeted student perceptions on how well Starfish™ notifications and follow-up stimulates seeking out and usage of campus-based resources. Respondents provided opinions based on their perceptions of the early alert system structure on campus to report how well Starfish™ inspires students seek the counsel of their instructors, seek guidance from academic advisors, attending campus resources like tutoring, and to perform better in courses. Additional survey items within the construct were designed to gauge whether students believed they personally benefitted from notifications from instructors and advisor follow-up. Table 35 presents data from demographic groups within the motivation to access institutional resources construct. As Table 35

Table 34

Demographic Results of Survey Items Related to Educational Satisfaction Construct

| Demographic | | Understand | | | Confidence | | | All Instructors | |
Characteristic	Agree	Neutral	Disagree	Agree	Neutral	Disagree	Agree	Neutral	Disagree
Gender									
Male	71	18	11	67	17	16	64	22	14
Female	70	19	11	66	20	14	63	24	13
Race/Ethnicity									
African American	69	19	12	65	19	16	63	25	12
Caucasian	68	20	12	66	19	15	64	23	13
Other	71	19	10	68	18	14	63	24	13
Classification									
Freshman	69	20	11	64	21	15	63	23	14
Sophomore	69	18	13	67	19	14	63	24	13
Junior	71	16	13	66	18	16	64	23	13
Senior	71	18	11	67	19	14	64	24	12
Student Population									
On Campus	70	18	12	66	19	15	64	23	13
Distance Education	71	17	12	67	19	14	63	24	13
Transfer	71	17	12	68	18	14	64	23	13
Honors	64	23	13	59	24	17	56	25	19
Student Athlete	69	20	11	66	19	15	64	23	13
GPA									
2.0 – 1.9	73	7	20	70	6	24	69	12	19
6.0 – 2.9	74	12	14	69	15	16	65	21	14
7.0 – 4.0	69	21	10	65	22	13	63	24	13

Table 34 (continued)

	Succeed			All Courses			Educational Satisfaction		
Gender									
Male	63	22	15	58	24	18	52	27	21
Female	63	23	14	62	28	10	51	29	20
Race/Ethnicity									
African American	63	23	14	56	28	16	50	30	20
Caucasian	63	23	14	58	25	17	52	27	21
Other	64	21	15	59	24	17	50	27	23
Classification									
Freshman	62	24	14	57	26	17	50	30	20
Sophomore	62	24	14	57	26	17	51	26	23
Junior	63	22	15	58	25	17	51	29	20
Senior	65	22	13	59	25	16	54	27	19
Student Population									
On Campus	63	23	14	59	25	16	52	28	20
Distance Education	65	23	12	58	27	15	52	29	19
Transfer	65	20	15	59	24	17	53	27	20
Honors	54	30	16	56	24	20	50	23	27
Student Athlete	64	21	15	54	30	16	50	27	23
GPA									
3.0 - 1.9	63	14	23	63	14	23	50	22	28
8.0 – 2.9	64	20	16	59	23	18	52	26	22
9.0 – 4.0	64	24	12	57	27	16	52	29	19

Table 35

Demographic Results of Survey Items Related to Motivation to Access Institutional Resources Construct

Demographic Characteristic	Perform Agree	Perform Neutral	Perform Disagree	Seek Instructor Assistance Agree	Seek Instructor Assistance Neutral	Seek Instructor Assistance Disagree	Seek Campus Resources Agree	Seek Campus Resources Neutral	Seek Campus Resources Disagree	Instructor Benefit Agree	Instructor Benefit Neutral	Instructor Benefit Disagree
Gender												
Male	69	17	14	66	25	9	62	22	16	62	21	17
Female	66	21	13	64	28	8	61	25	14	61	23	16
Race/Ethnicity												
African American	67	20	13	63	28	9	60	25	15	61	22	17
Caucasian	67	20	13	64	27	9	61	24	15	61	23	16
Other	69	18	13	68	26	6	62	23	15	63	20	17
Classification												
Freshman	66	22	12	64	29	7	62	24	14	60	23	17
Sophomore	65	20	15	64	28	8	58	24	18	60	23	17
Junior	68	18	14	65	27	8	61	23	16	62	21	17
Senior	69	19	12	67	26	7	62	24	14	63	22	15
Student Population												
On Campus	67	20	13	65	27	8	62	23	15	62	22	16
Distance Education	68	19	13	65	27	8	61	25	14	63	23	14
Transfer	69	17	14	65	26	9	62	22	16	63	21	16
Honors	59	26	15	52	29	9	58	25	17	53	25	22
Student Athlete	68	19	13	67	27	6	61	24	15	65	24	11
GPA												
0.0 - 1.9	71	7	22	69	12	19	65	11	24	60	15	25
2.0 – 2.9	70	14	16	66	24	10	62	21	17	63	18	19
3.0 – 4.0	66	22	12	64	30	6	61	26	13	61	26	13

Table 35 (continued)

	Increase Enrollment			Seek Advisor Guidance			Benefit Advisor		
Gender									
Male	60	24	16	59	23	18	58	28	14
Female	58	27	15	58	25	17	56	31	13
Race/Ethnicity									
African American	59	27	14	56	26	18	54	32	14
Caucasian	59	27	14	59	24	17	57	30	13
Other	60	24	16	67	19	14	58	27	15
Classification									
Freshman	59	27	14	58	25	18	57	30	13
Sophomore	57	29	14	56	25	17	53	33	14
Junior	59	25	16	59	24	17	57	29	14
Senior	60	26	14	60	23	16	60	27	13
Student Population									
On Campus	60	26	14	59	24	16	57	29	14
Distance Education	60	27	13	59	25	15	58	30	12
Transfer	59	26	15	59	23	17	58	28	14
Honors	58	26	16	56	27	20	53	32	15
Student Athlete	60	26	14	57	26	16	54	34	12
GPA									
1.0 - 1.9	59	18	23	61	11	23	55	26	19
4.0 – 2.9	58	25	17	56	23	18	55	29	16
5.0 – 4.0	59	27	14	59	26	16	57	30	13

demonstrates, paralleling the first two constructs, consistencies exist across demographic

characteristics within the motivation to access institutional resources construct.

Open-Ended Response Data

In addition to items on the survey, respondents were provided the opportunity to note

specific ways they believe Starfish™ connects them to the ECU campus not addressed in the

survey via three open-ended questions. Additionally, students were offered the ability to report

perceived strengths of the institutional early intervention strategy and Starfish™ early alert

system usage. Open-ended items also allowed participants to include suggestions of what to

modify in the existing early alert system and what additions or changes they feel would improve

institutional approaches related to system structure.

Survey respondents totaled 4,658, however, a lower number of students recorded answers

to the open-ended questions. In fact, less than half of total respondents completed the open-ended

survey items. The first open-ended survey item, dealing with how the system connects students

to campus, logged 2,177 (47% of total responses) answers. The second open-ended question,

referencing perceived strengths of the system, received 2,160 (46% of total responses) responses.

The third open-ended survey item requested participants record any suggested improvements to

the system. This final question yielded the least responses of all the open-ended survey items,

collecting only 2,026 (43% of total responses) responses.

Qualitative student responses were collected and examined using the phenomenological

methodology of written response (Creswell, 2007). Participant responses were reviewed and

were clustered into groups according to theme and analyzed for strengths and recommendations

for improving the Starfish™ system through deletions, modifications, and additions. Clusters

were also created for specific ways students reported that the Starfish™ system provides

connectivity to campus. The thematic clusters were analyzed for themes and patterns illustrating the essence of student perceptions of institutional system utilization and structure.

Students reported that notifications from faculty, advisors, and follow-up communications from campus resources were beneficial in assisting them in determining course success, major changes, and student support resource utilization. Additionally, participant responses indicated that while the system ideology can be overbearing and possibly considered coddling, reducing personal responsibility, the majority of students believe Starfish™ usage promotes academic success, motivation to achieve, and institutional connectivity. The most frequent response was that early alert system usage provides timely academic information, affording students the ability to monitor their academic progress more effectively, including pertinent information to consider dropping courses.

A consistent theme in the open-ended responses was the use of the word care, referring to how students felt about their instructors and advisors using Starfish™. In the same vain, students self-reported that the system catalyzes their willingness to communicate directly with their instructor and advisor through email, personal conversations, utilizing office hours, and even visiting campus resources. Further evidencing the merits of Starfish™, responses also directly attributed motivation to seek resources to the system notifications. Specifically noted was the use of embedded Pirate Tutoring Center tutors into chemistry courses. Tutors take information shared during the course and create study materials, hold study sessions, and facilitate tutor assignment. Student responses cited the Starfish™ as the nudge needed to act on the need for academic support services.

Negative remarks were present in survey responses concerning the Starfish™ system at ECU, however they were in the minority. Some students expressed that the early alert system

was an annoyance, serving as a redundant reminder of things they already know about their academic performance. Another small pocket of responses mentioned that the positive notifications perpetuated a divide between those students who received negative notifications. While some students felt Starfish™ had no value, that population's responses contradict the majority of open-ended responses.

Respondents did provide tangible suggestions and recommendations for how to strengthen and improve institutional Starfish™ application. The most common recommendation was to require all instructors to actively use Starfish™ in all courses, providing consistent monitoring. Other comments referenced the need for expanded dissemination of information on ECU's use of Starfish™ to students and exactly how the early intervention structure functions. Many respondents indicated that a communication strategy to inform students is needed to educate students on what to expect in the early alert system at ECU. Also included in the recommendations for improvement was a more seamless method to access Starfish™, citing displeasure with the current location within the Blackboard™ Course Management System. Respondents indicated that having one fluid system where all academic information could be accessed would be beneficial. Finally, a large number of respondents reported that no changes were needed.

Summary

The drive of this research was to examine student perceptions of ECU's usage of the Starfish™ early alert system. Additionally, analysis to determine associations between perceptions and demographic indicators were assessed. Overall, while findings indicate that students value the intentionality faculty and academic advisors exhibit by using notifications to provide feedback through the Starfish™ system, consistent usage patterns are needed to prove

more efficient and effective. More specifically, students report increased senses of belonging, motivation, achievement, and satisfaction as a direct result of Starfish™ usage, however, note that many professors and academic advisors do not maximize system capabilities or use the system at all. Inconsistencies in faculty and academic advisor usage create the majority of negative perceptions by students, citing the necessity for academic leaders to develop strategies for universal policies to encourage and promote Starfish™ use. This chapter included a detailed account of the data analyses conducted for this study, exploring four research questions and one hull hypothesis based on the questions.

The subsequent chapter will provide analysis of findings, conclusions, and present implications and practical applications for practitioners in higher education. Also included are suggestions for future academic research related to this study.

CHAPTER 5: DISCUSSION

Retention and graduation rates have long been a focus of research in higher education (Satyanarayana, Li, & Braneky, 2014), but, attention to the myriad of methods employed to increase and support student success as a means to improve retention rates and support timely graduation has heightened exponentially in recent years (Bettinger & Baker, 2011). This study, grounded on Astin's (1996) theory of student involvement and Tinto's (1975, 1987, 1993) student development theory, specifically addressed four research questions and one null hypothesis aimed at discovering student perceptions of ECU's utilization of the Starfish™ early alert system.

Chapter One of this study provided an introduction to the concerns related to student retention and graduation as well as the foundational underpinnings of early intervention strategies being used as retention mechanisms. Chapter Two offered a summation of historical and contemporary research related to these topics. Chapters Three and Four provided a detailed overview of the research structure of the study as well as reported statistical findings of the study. This chapter features a review and recommendations for future academic research in relation to the research study and to the literature presented in Chapter Two. Additionally, suggestions for further research studies to add to the knowledge base are outlined in this final chapter.

In summary, this study investigated student perceptions of the Starfish™ system at ECU. In addition, the study examined student opinions to illuminate the presence of trends and patterns within topical areas of satisfaction, motivation, and sense of belonging. Toward that end, research questions were as follows:

1. Do students perceive early alert systems to increase their sense of belonging to campus?

2. Does the use of early alert systems increase student satisfaction with their education?

3. Do early alert notifications increase student motivation to utilize campus resources?

4. Do differences exist in the perception of early alert systems based on demographics?

This study addresses a growing need for data on how to promote student engagement, increase student interaction with instructors and academic advisors, and bolster student motivation and academic satisfaction through technological intervention in order to combat the problem of attrition. Kuh, Kenzie, Schuh, and Whitt (2005) stressed that successful retention strategies should directly promote student engagement. The retention problem incorporates a variety of factors that perpetuate the reality that understanding the issue is difficult. As many institutions develop and implement retention tactics that incorporate innovative technology, determining programmatic worth and success can prove to be extremely challenging (Dingman, Madison, & Madison, 2011). Furthermore, specific investigations regarding early intervention as a means to promote retention and graduation rates are absent from the literature, therefore serving as the focus of the current study.

Participants in this study were drawn from the undergraduate enrollment at ECU during the fall 2014 academic term. The study found that overall the seamlessness of the early alert system; promotion of student, instructor, and advisor communication; and direct linkage to campus resources were foundational components to produce statistically significant results across numerous student demographic characteristics.

Outcomes from this study may provide valuable insight for academic administrators, faculty, and staff in higher education who are focused on supporting student success, retention,

and graduation through early intervention strategies. How early alert systems are developed and implemented effectively to facilitate student success and persistence could be an integral piece of information for educational leaders as they structure support services for students. Such support services may facilitate improvement in student transition, engagement, satisfaction, and, ultimately, persistence. This research works to illuminate student opinions of Starfish™ at ECU to provide an additional layer of consideration for educational leaders contemplating early alert systems to support student success, retention, graduation, engagement, development, and, specifically, to solve the massive concern of college student attrition.

Discussion of Findings

This section discusses findings from the data analyses detailed in Chapter Four, specifically, the extent to which the descriptive statistics support the previous literature concerning student engagement and development theories in higher education. Additionally, it incorporates discussion of the analytical and practical implications of the statistics related to the research questions. Results indicate that, based on student responses, intentionally intervening through the Starfish™ early alert system could lead to greater opportunities for students to build richer institutional connections through multiple channels.

Overall, the results from the descriptive statistical analyses provide additional perspectives on how students view early intervention strategies that had not been detailed in previous literature. Furthermore, the results have stimulating implications for future research studies in addition to considerations for educational administrators and faculty. Interestingly, as a whole, the results indicate that students reported a positive outlook of ECU's use of the Starfish™ early alert system in relation to improving academic success, satisfaction, motivation, and propensity to feel more connected to the institution. However, the results also indicate that

amendments could be made to the system to improve accessibility, effectiveness, and intentionality. Likewise, the results suggest that while the majority of students find the early intervention strategies beneficial, optimizing consistency in usage is paramount to system maximization and efficiency. Finally, the results indicate that based on respondent perception, early alert systems are acceptable retention tools for building student connections to key institutional support mechanisms, including faculty, advisors, and other critical campus resources. In sum, electronic early alert systems can bolster intentional faculty and administrative efforts to retain, develop, and ultimately graduate students.

Sense of Belonging

This section provides an examination of findings related to the first research question proposed in chapter one that sought to explore student perceptions of the Starfish™ early alert system related to the system increasing their sense of belonging to the institutional:

Do students perceive early alert systems to increase their sense of belonging to campus?

Tinto's (1975, 1987, 1993) and Astin's (1996) theories emphasize the idea that college student connection to institution is directly linked to student persistence, suggesting that students may base their decision to remain enrolled on their perceived sense of belonging. The importance of academic and social integration through deliberate experiences that provide opportunities for establishing connections to campus is a key factor for administrators to consider.

This research study included a construct to gauge student perception of Starfish™ early alert system as a mechanism to develop rich feelings of belonging between students and their institution. Findings support the reality that early alert systems bridge the gap between students and campus through alternative opportunities for students to communicate with individuals who

care about their academic success. Instructor notifications and academic advisor follow-up communications provide students with a feeling of being cared for and being meaningful to the institution. Also indicated in the findings was confirmation that students believe instructors participating in early intervention initiatives such as Starfish™ actually care more about their academic success.

As Tinto (1975, 1987, 1997, 2012) posits, interaction through relationships with faculty and campus administrators is an important factor in promoting and cultivating persistence in college. Analyses regarding communication and interactions with faculty, advisors, and campus resources were incorporated in this study to determine if tenets within student development and engagement theories are in accord with ECU student perceptions that Starfish™ impacts their sense of belonging. This study found that students value and appreciate support from instructors and advisors through usage of the early alert system. This study also found that initial contact from instructors and advisors within the Starfish™ early intervention structure catalyzed students to be even more connected to the larger campus community.

Increasing feelings of student connectedness to their respective college campuses is a major accomplish for institutions working to reduce attrition and promote retention and graduation rates. As administrators look for cost-effective measures to increase persistence, this study produces supporting data that early alert systems are a valued commodity according to students. Furthermore, simply expanding the existing interaction opportunities through electronic processes such as instructor notifications and academic advisor follow-up communications can prove fruitful for campuses looking to keep students enrolled and more integrated into campus environments. Moreover, as stated by Habley (2004) and Kuh, Cruce, Shoup, Kinzie, and Gonyea (2008), students' interactions with individuals on campus who care about their success

directly influence persistence. This study produces findings that support the idea that Starfish™ and early alert system usage not only increase student feelings that someone on campus cares about their success, but also increase their connectedness and sense of belonging to the entire academic institution. Such connections have immeasurable impressions on students and can perpetuate decision to remain enrolled (Kurland & Siegel, 2013).

Educational Satisfaction

This section discusses findings from the results of the second research question proposed in Chapter One that sought to examine student perceptions of the Starfish™ early alert system related to its use increasing their level of educational satisfaction:

Does the use of early alert systems increase student satisfaction with their education?

As Knutson (2012) notes, student consumerism in higher education places educational leaders in precarious decision-making models, focused on developing and implementing attractive services and resources to recruit and retain prospective and matriculating students. Furthermore, Wilson (2014) postulates that student recruitment is big business and that institutions find themselves in an arms race to recruit the best and brightest prospective students. As such, students and parents making college decisions investigate student support systems and research retention and graduation rates of potential institutions in order to make more educated decisions. In addition, Pascarella and Terenzini (2005) point out that, as a whole, academic performance and student support services impact student intention to persist.

An example of how institutions have answered the call for innovative strategies to attract potential enrollees are early alert systems, such as Starfish™. Early alert systems are being used to bridge the gap between students and institutional stakeholders and to promote student development and engagement through the use of technology (Kuh & McCormick, 2011). The

premise of early intervention and alert systems is to reinforce and encourage richer connections with the faculty, academic advisors, and critical student support personnel. Umbach and Wawrynski (2005) explain that positive correlations exist within attitudes of satisfaction between students experiencing more opportunities to connect with campus officials and persistence. Moreover, this research examined how students believe early alert system usage impacts their feelings of satisfaction of their educational experiences in college.

Survey items within the educational satisfaction construct directly addressed student opinions about Starfish™ and the system's ability to increase approval of related experiences. Largely, students reported agreement that early alert system infrastructure indeed makes them feel more satisfied. Specifically, students reported that Starfish™ helped increase their understanding of their academic progress within courses, helped them succeed, and built their academic confidence. Early alert systems have the capability to move students down a continuum of academic competence and success by accentuating traditional campus interactions with electronic mechanisms. Whether instructor-based notifications, advisor follow-up, or referrals to campus resources, early alert systems yield invaluable and appreciated outreach to students through both positive and negative notifications.

As noted in previous chapters, all faculty are not required to utilize Starfish™. Taking this fact into consideration, responses to survey items regarding student opinions on whether the system should be used by all instructors are interesting. Explicitly, 60% of students indicated that Starfish™ should be used in all courses. Additionally, nearly half of the students participating in this study noted that they would be more satisfied if the Starfish™ early alert system were a component in every course they took. While large percentages of students indicated that they

requested more instructors and courses to implement Starfish™, only 40% agreed that they are more satisfied with their education based directly on the use of the system.

Succinctly, students believe that early alert systems impact their level of satisfaction with their educational experiences. Components of the construct within this study point to the fact that students see the value and utility of the system, not only to shape their satisfaction levels, but to increase their understanding, confidence, and overall success within courses utilizing Starfish™. As students enter college underprepared and lacking academic competence, early alert systems afford ample opportunity to provide students with important feedback on their progress and supplement their efforts through connections with faculty, advisors, and campus resources (Chait & Venezia, 2009; Kirst-Ashman, 2007). As Zwick (2013) explains, students who feel better about their educational experiences and academic progress are retained and graduated at higher levels. Findings from this study support the claim that early alert systems and associated notifications provide students immediacy in regards to their status in courses, thus improving their satisfaction.

Motivation to Access Institutional Resources

This section includes an exploration of findings from the third research question proposed in Chapter One that intended to appraise student opinions on the Starfish™ early alert system and determine if system usage promotes an increased motivation to access student support resources on campus:

Do early alert notifications increase student motivation to utilize campus resources?

Many factors exist that prompt students to seek resources. As Wolf-Wendel, Ward, and Kinzie (2009) point out, the greater the level of effort students put into investing in purposeful campus interactions, the stronger their connection to the institution. Furthermore, Kuh, Kinzie,

Schuh, Whitt, and Associates (2010) note the substantial value that exists in deliberate programmatic opportunities provided to students that encourage them to seek resources. This study shows that students find Starfish™ to be a valid tool by motivating them to take some sort of action in response to instructor notifications and advisor follow-up.

Findings confirm the reality that over half of students participating reported taking some action as a direct result of faculty or advisor communication regarding their course progress. Actions taken in response to notifications and follow-up included responding to advisors and faculty via email, scheduling appointments with faculty and advisors, speaking with faculty and advisors, altering current habits, seeking campus resources, and others. While many took no action, a valid explanation could be linked to whether Starfish™ notifications were positive or negative in nature. Typically no response is expected if a positive flag is raised. Future studies should include this consideration to produce richer exploration, including additional questions to qualify responses.

Survey items incorporated into the motivation to access institutional resources construct targeted student perceptions of early alert systems as mechanisms for action and internal feelings of motivation. As such, students reported that the system does work to establish intrinsic mobility towards seeking campus assistance. Findings indicate that students feel an associated benefit from instructor use of the early alert system. Furthermore, in addition to faculty usage benefitting students, findings uncovered that students report being more motivated to seek assistance from instructors who implement Starfish™ in their courses than those who do not. Jaeger and Hinz (2008) specifically document that institutions focused on improving student success and persistence should place priority on student-to-faculty interactions. Students report

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high levels of institutional engagement, satisfaction, and success when interactions with faculty are deliberate, intentional, and meaningful (Umbach & Wawrzynski, 2005).

Also within the motivation to access institutional resources construct were questions that requested feedback concerning how well students believe Starfish™ motivates them to perform certain actions. In reference to Tinto's (1993) theory that incorporates "academic and social integration," Starfish™ delivers an additional layer of faculty and advisor communication for students. Respondents stated that the early alert system motivated them not only to seek assistance from faculty, but to seek guidance from academic advisors as a result of notifications and follow-up. Additionally, students report that Starfish™ notifications and follow-up also prompt motivation to seek campus resources such as the Pirate Tutoring Center. In sum, students report that the early alert system provides great support that motivates them to succeed in courses, be more connected to campus, and remain enrolled.

Findings from this study show that students believe early alert system structure motivates them, thus assisting institutions in bridging the gap between student and campus. As campuses face challenges to develop initiatives to connect students to faculty and to campus resources, Starfish affords institutions a cost-effective and low-maintenance platform for doing so. McCormick, Kinzie, and Gonyea (2013) compliment institutions that maximize innovation in connecting students to campus entities. In a myriad of ways and from various directions, Starfish™ motivates student response and action to notifications and follow-up. Such responsivity engenders the lasting connections mentioned in many theorists' tenets, none more important than Chickering and Gamson's (1987) work regarding student development and engagement.

Differences Based on Demographics

       This section itemizes findings related to in the fourth research question proposed in Chapter One that sought to discover existing trends in student perceptions of the Starfish™ early alert system based on demographic information supplied from study participants:

Do differences exist in the perception of early alert systems based on demographics?

       Data analysis produced evidence that there were significant relationships present between survey results regarding student opinions about Starfish™ based on demographics. Data analysis also produced consistent measures across demographic characteristic groupings; however, difference did exist within some groups. As such, along with trends and generalizations within survey responses amongst demographic groups, paralleling total population findings, the overall survey results indicate statistical differences do exist among demographic populations. Furthermore, data indicate that although differences exist, total student responses promote the usage of early alert systems as effective for all demographic characteristics.

       In terms of number of notifications received, even representation was reported across groups. One existing trend discovered was the fact that distance education and honors students noted receiving fewer Starfish™ flags. This could be a result of fewer faculty seeing a need to report positive notifications for honors students and of online instructional methodology lacking some of the connectivity that on-campus courses possess. Additionally, junior and senior students also note receiving fewer notifications than freshmen and sophomores. A plausible reason for these findings could be related to the fact that more tenured faculty typically teach upper-level courses. Furthermore, upper-division faculty could view notifications as extraneous, not necessary for more mature students, or, that older, more experienced students have more

advanced study habits. Overall, the number of flags across demographic groups had few strong patterns.

As mentioned in the motivation to access institutional resources construct, action taken by respondents in response to instructor and advisor communication was relatively constant across demographic groups, with few drastic differences. While few differences exist between male and female responsivity, African-Americans respond to instructor and advisor prompts at a higher rate than all other races. Freshmen and sophomore students are more prone to take action than junior and senior students. As such, more mature students may possess more academic confidence to handle situations without assistance. Younger students may require more feedback about their progress and require assistance at a higher rate, thus the higher report of taking action for novice students.

In regards to action taken in response to instructor and faculty provoking via Starfish™ notifications, GPA data show interesting findings, too. Students with lower GPAs reported taking more action than those with moderate and high GPAs. Students with lower GPAs typically need more assistance, thus notifications may mean more for this population. Morisano, Hirsh, Peterson, Pihl, and Shore (2010) explain the risk associated with lower-performing students and the need to keep students well informed about their academic status. Students with higher GPAs, however, report the lowest response to Starfish™ notifications. In fact, over half of higher-performing students with higher GPAs took no action. Students with higher performance may garner fewer negative flags, thus requiring less action to be taken.

Student populations also produced level findings with the exception of transfer and honors students. Specifically, transfer students reported taking action at a higher rate than any other student population. An explanation could be the transition to a new institution and fear of

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failure. Conversely, honors students reported the lowest response to instructor and advisor communication. High-performing students may receive more positive flags, requiring no action or follow-up with instructors or advisors. Students with lower GPAs may also be facing academic regulations such as potential probation or suspension, thus providing more encouragement to take action.

The sense of belonging, motivation to access institutional resources, and education satisfaction constructs investigated in this study also provided moderately significant results in regards to differences across demographic groups. While there was slight variation in student response in this study according to survey items within the constructs, important information on student perceptions and considerations for academic leaders can be extracted through findings. At base, comparisons amongst the demographic characteristics yielded some quality findings within this study. Specifically, the patterns within demographic populations uncovered in data analysis produced findings beneficial to educational leaders focused on developing and implementing early alert systems.

While many consistencies exist across demographic characteristics, this study also produces interesting findings based on demographic groupings. Though this survey provides insight into student perceptions of early alert system usage, overall this study produces only moderately significant findings in relation to demographic groups and their thoughts on the Starfish™ early alert system. Although results indicate that Starfish™ does appear to provide students with satisfaction, motivation, and engagement as indicated by the overwhelmingly positive student response on the survey, lack of extreme statistically significant differences between demographic groups suggests that there are limited benefits to directing early intervention efforts intentionally to individual demographic groups. Further, while targeted

efforts through early alert systems may not exist for demographic characteristics, data from this study can provide information to form additional strategies for demographic groups. While generalizations can be made through this study, further research is needed to determine broader spectrum approaches to early alert system usage within demographic groups.

Recommendations for Future Research

Following are recommendations for areas of additional research as indicated from the outcomes and finding of this study:

1. Expand research regarding the longitudinal impact of intentional systems of early intervention on student retention, based on discrepancies in this study.

2. Replicate this study in diverse institutional environments as this may result in varying outcomes and findings.

3. Replicate this study later in the academic semester to provide more opportunity for notifications to be sent as this may result in varying outcomes and findings.

4. Replicate this study in the spring semester to provide students more exposure to Starfish™ and the early intervention structure. This may provide more robust findings.

5. Conduct replicated research studies on multiple campuses to determine consistency in outcomes across institutions of similar size and type.

6. Conduct a longitudinal study to explore the impact of early alert system usage on retention rates. This may subsequently reinforce administrative, faculty, and financial support for system usage.

7. Conduct a longitudinal study to explore the impact of early alert system usage on graduation rates. This may subsequently reinforce administrative, faculty, and financial support for system usage.

8. Conduct a study that incorporates a pre-test and post-test methodology.

9. Conduct a study that considers students who withdraw from institutions, structuring survey instrument items that specifically approach reasons for attrition and considerations on how early alert systems could prevent and support withdrawing students.

10. Conduct a qualitative study that more deeply investigates student perceptions of Starfish™ and the early intervention process. This may provide more robust findings and implications for system adaptation.

11. Conduct studies to approach population-specific perceptions and responses to Starfish™ and the early intervention process. This may increase response rates in populations underrepresented in this research, thus providing more generalizable findings.

Implications for Administrators and Educational Leaders

The following implications related to early alert systems for administrators, faculty, and educational leaders involved in the development, implementation, and monitoring of strategies to bolster student development, engagement, and retention are based on the outcomes of this study:

1. Usage of the Starfish early alert system could have significant impact on student opportunities for making connections with faculty, academic advisors, and campus support services. Moreover, expanding faculty and advisor usage could significantly

impact student interactions, as this study provides evidence that students perceive early alert systems as vehicles for connectedness.

2. Student retention, typically a universal institutional goal, may be increased by expanding faculty and advisor usage of the Starfish™ system. System usage provides an avenue for student connections to be made to faculty, academic advisors, and campus resources, which appears to offer more support for transitioning students, resulting in decreased attrition, stronger sense of belonging, engagement, satisfaction, motivation, and increased retention and graduation rates.

3. Students place value on having all instructors incorporate early alert systems in all courses. Faculty cherish academic freedom in the classroom, thus administrators are unlikely to mandate Starfish™ usage. Thus, it is imperative for academic administrators and policymakers to understand the importance of the faculty role within the early alert system and to cultivate faculty buy-in, incentivizing faculty participation if needed.

4. Although students perceive Starfish™ to be an effective tool, thorough communication related to specific structural components and features is imperative. Students, faculty, advisors, and support services involved in the early alert system must be appropriately educated to maximize system usage.

5. Development and implementation of an early intervention strategy should possess an expansive marketing and communication campaign to inform all participants of expectations and procedures. Students and new employees should have Starfish™ informational sessions and formal training during orientations.

6. Demographic characteristics are not significant factors in student perceptions for the most part; therefore, population-specific outreach within early alert systems based on demographic factors would yield no significant benefits.

7. Broadening currently used practices in the early alert system structure, such as notifications from instructors and advisor follow-up, to include expansion to more campus resources and support opportunities can provide richer opportunities to bond students to campus.

8. While early alert systems offer students opportunities to be more connected to campus, more motivated to seek resources, and better satisfied with their educational experiences, such systems should amplify existing retention initiatives. Administrators should consider evidence in the literature and within this study that suggests Starfish™ and other early intervention processes are not a suitable replacement for more traditional student development and engagement opportunities.

Findings suggest that educational leaders may continue to utilize early intervention strategies as a successful retention initiative to support student persistence and prevent student attrition. Outcomes from this study may provide valuable insight to those interested in bolstering retention and graduation rates by addressing student attrition, as these outcomes contribute to the greater understanding of how early alert systems might be used more effectively as a retention initiative.

Research findings also suggest that institutional decision-makers may continue to utilize early alert systems as a successful initiative to promote student development and engagement. It is important, however, for administrators to consider student perspectives when developing and establishing early alert systems. Furthermore, an effective and efficient early intervention

structure should be seamless, connecting students, faculty, advisors, and campus support services without unnecessary efforts by the parties involved. This study has made it clear that early alert systems provide the opportunity for students to gain enriching interactions with campus officials through technological connections, but the question is how educational leaders will continue to provide additional success, development, and engagement opportunities for students to reinforce early alert system foundational tenets outlined in the review of literature in this research study.

Conclusion

As institutions continue to search for innovations that link students to campus and promote student success, development, and engagement, it is important that administrators consider the extent to which the use of technology impacts student experiences. Generally, data from this study indicate that students appreciate efforts associated with early intervention strategies like Starfish™. It is, however, imperative to note that early alert systems only heighten and support existing tangible interaction opportunities. Nevertheless, as this study confirms, student perceptions of early alert system usage are not universal, meaning constant assessment to determine the most effective structural components and efficient practices is essential. As further understanding of student perspectives of early alert systems grows, institutions can develop intervention strategies to maximize early alert system impact, ultimately improving academic and social development and engagement opportunities for students. Primarily, this study provides evidence that placing considerable weight on student perceptions of such initiatives is endorsed and essential for academic leaders focused on finding quality tools to develop, engage, retain, and ultimately, graduate students.

Overall, it is apparent from data collected in this study that students place value on the utilization of Starfish™ at ECU as a retention tool to combat attrition and support richer

connections to campus, educational satisfaction, and motivation to access resources. The differences in expectations and perceptions that students possess regarding the Starfish™ early alert system can be minimized by intentional and deliberate information disseminated to students, faculty, and campus support professionals explaining the system and usage expectations. With increasing awareness of system capabilities and intentionality being a top priority, administrators will be able to augment more effective early alert systems by improving consistency in student, faculty, and advisor usage.

This study serves to inform administrators, educational leaders, and faculty about potent areas of enhancement to early alert systems based on student perspectives. This study only provides a starting point for understanding completely how students view early alert systems. Further research into larger and more diverse student populations and subgroups is necessary to form a broader spectrum of understanding. The findings of this study provide a foundation for institutions considering the development and implementation of early alert systems, such as ECU's utilization of Starfish™, as an effective retention tool to solve the attrition problem on college campuses.

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APPENDIX A: INSTIUTIONAL REVIEW BOARD APPROVAL

EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board Office
4N-70 Brody Medical Sciences Building· Mail Stop 682
600 Moye Boulevard · Greenville, NC 27834
Office **252-744-2914** · Fax **252-744-2284** · **www.ecu.edu/irb**

Notification of Initial Approval: Expedited

From:	Social/Behavioral IRB
To:	Steven Asby
CC:	Cheryl McFadden
Date:	9/2/2014
Re:	UMCIRB 14-001306 Student Perceptions of Starfish

I am pleased to inform you that your Expedited Application was approved. Approval of the study and any consent form(s) is for the period of 9/2/2014 to 9/1/2015. The research study is eligible for review under expedited category #7. The Chairperson (or designee) deemed this study no more than minimal risk.

Changes to this approved research may not be initiated without UMCIRB review except when necessary to eliminate an apparent immediate hazard to the participant. All unanticipated problems involving risks to participants and others must be promptly reported to the UMCIRB. The investigator must submit a continuing review/closure application to the UMCIRB prior to the date of study expiration. The Investigator must adhere to all reporting requirements for this study.

Approved consent documents with the IRB approval date stamped on the document should be used to consent participants (consent documents with the IRB approval date stamp are found under the Documents tab in the study workspace).

The approval includes the following items:

Name	Description
AsbyProposalDraft-postproposal-7-31-14.docx	Study Protocol or Grant Application
Consent letter-Asby Dissertation.doc	Consent Forms
Early Alert Student Survey-Updated.docx	Surveys and Questionnaires
Email Invite-Asby Dissertation.docx	Recruitment Documents/Scripts

The Chairperson (or designee) does not have a potential for conflict of interest on this study.

IRB00000705 East Carolina U IRB #1 (Biomedical) IORG0000418
IRB00003781 East Carolina U IRB #2 (Behavioral/SS) IORG0000418

Study.PI Name:
Study.Co-Investigators:

APPENDIX B: SURVEY INSTRUMENT

Student Perceptions of Starfish

Q1 Please record answers for the questions below and record answers for all survey items before submitting.

Age:

Q2 Current student classification:
- ❍ Freshman (1)
- ❍ Sophomore (2)
- ❍ Junior (3)
- ❍ Senior (4)

Q3 Gender:
- ❍ Male (1)
- ❍ Female (2)
- ❍ Other (3)

Q4 Major:

Q7 Race/Ethnicity:
- ❍ African American (1)
- ❍ Asian American (2)
- ❍ Caucasian (3)
- ❍ Hispanic American (4)
- ❍ Multiracial (5)
- ❍ Native American (6)

Q8 Cumulative GPA:

Q9 Please indicate any population attributes that apply:
- ❑ On-Campus (1)
- ❑ Distance Education (2)
- ❑ Transfer (3)
- ❑ Honors College (4)
- ❑ Student Athlete (5)

Q11 Please indicate number of Starfish notifications you have received during the fall 2014 semester:
○ One (1)
○ Two (2)
○ Three (3)
○ Four or More (4)
○ None (5)

Q13 Please select all that apply based on your knowledge of Starfish usage at ECU.Upon receiving a Starfish notification from my instructor, I:
❑ Responded via email (1)
❑ Made an appointment with my instructor (2)
❑ Made an appointment with my academic advisor (3)
❑ Communicated with my instructor in person (4)
❑ Altered my habits (5)
❑ Visited the Pirate Tutoring Center (6)
❑ Changed majors (7)
❑ Took no action (8)
❑ Other: (9) _____

Q14 Upon receiving a Starfish follow-up from my academic advisor, I:
❑ Responded via email (1)
❑ Made an appointment with my instructor (2)
❑ Made an appointment with my academic advisor (3)
❑ Communicated with my instructor in person (4)
❑ Altered my habits (5)
❑ Visited the Pirate Tutoring Center (6)
❑ Changed majors (7)
❑ Took no action (8)
❑ Other: (9) _____

Q15 Please select the most appropriate answer choice based on your knowledge of Starfish usage at ECU:

	Strongly Agree (1)	Somewhat Agree (2)	Somewhat Disagree (4)	Strongly Disagree (5)	Neutral (3)
I believe Starfish helps students succeed (1)	○	○	○	○	○
I benefit from instructors' use of Starfish (2)	○	○	○	○	○
I benefit from follow-up from my academic advisor (3)	○	○	○	○	○
I am more satisfied with my education due to the use of Starfish (4)	○	○	○	○	○
I believe Starfish should be used by all instructors (5)	○	○	○	○	○
I would be more satisfied with my education if Starfish was used in every course (6)	○	○	○	○	○
Starfish notifications and advisor follow-up make me feel like someone cares about my success (7)	○	○	○	○	○
I feel more connected to campus due to Starfish notification and advisor follow-up (8)	○	○	○	○	○
Instructors who use Starfish care more about my success than those who do not (9)	○	○	○	○	○

Q16 I believe that Starfish notifications:

	Strongly Agree (1)	Somewhat Agree (2)	Somewhat Disagree (4)	Strongly Disagree (5)	Neutral (3)
motivate me to perform better in my courses (1)	○	○	○	○	○
help me build academic confidence (2)	○	○	○	○	○
help me better understand how I am doing in courses (3)	○	○	○	○	○
motivate me to seek assistance from instructors (4)	○	○	○	○	○
motivate me to seek guidance from my academic advisor (5)	○	○	○	○	○
motivate me to seek campus resources like tutoring, etc.. (6)	○	○	○	○	○
increase my motivation to remain enrolled at ECU (8)	○	○	○	○	○

APPENDIX C: LETTER OF EXPERT VALIDATION

East Carolina University.

Academic Advising & Support
2500 Old Cafeteria Building
Greenville, NC 27858-4353

Mr. Steven Asby
2500 Old Cafeteria Building
East Carolina University
Greenville, NC 27858
July 18th, 2014

Dear Mr. Asby,

I have reviewed your Student Perceptions of ECU's Starfish Early Alert System Survey. I believe that your survey accurately reflects the goals of your research. In addition, the survey items reflect national surveys on student engagement, early intervention, and retention. You have addressed appropriate topics related to early alert systems, sense of belonging, and demographic information.

I have recommended a few changes to your survey. With the inclusion of the changes, I believe that the questionnaire will provide the necessary information for your study. In my professional opinion, the items of the questionnaire are valid measures for your research needs.

As Executive Director of Retention Programs and Undergraduate Studies, contributor to Starfish development and implementation on campus, and coordinator of the ECU Academic Advising Collaborative, this research will assist administrative decisions regarding early intervention at ECU. Additionally, your pilot study of the survey also serves to strengthen reliability and should warrant more detailed analysis of student response.

Please let me know if I can be of any assistance as you venture into the next phase of your research.

Best wishes,

Jayne Geissler, PhD
Executive Director of Retention Programs and Undergraduate Studies
Academic Advising and Support Center

East Carolina University.

Office of the
Dean of Students

Division of Academic
and Student Affairs

362 Wright Building
East Carolina University
Greenville, NC 27858-4353

252-328-9297 office
252-328-9174 fax
www.ecu.edu

July 22, 2014

Steven,

I have carefully reviewed your survey on student's perceptions of the Starfish early alert system utilized here at East Carolina University. The instrument you have developed seems to be valid relative to the intent of your study given the questions posed. I appreciate that you have equally developed and distributed the questions based on their focus, such as motivation, satisfaction, and belonging questions, and that you have a variety of questions formats to engage the participant and to gather the desired data.

I wish you the best of luck in administering your survey and stand ready to assist you in any way that I can.

Sincerely,

Travis Lewis, Ed.D.
Associate Dean of Students
East Carolina University
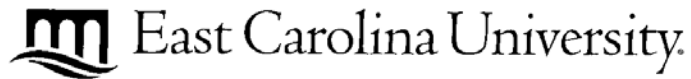
July 18, 2014

Mr. Steven Asby
2500 Old Cafeteria Building
East Carolina University
Greenville, NC 27858-4353

Dear Steven,

I have reviewed the items on the *Student Perceptions of ECU's Starfish Early Alert System Survey* you provided. I found that the questions provided to be clear and appropriate for the purpose of your research.

Attached are my comments. I recommend the removal of the first statement in section III, I do not believe students will understand what a "worthwhile retention and academic success tool" means. I also feel a question regarding the students' knowledge of Starfish would be appropriate. Outside of these suggestions and additional comments made on the attached document, it is my opinion that the survey provided is a valid measure for your research needs.

As Starfish Project Manager, I am very interested in the results of your research. These results will provide direction on how to improve perception and educate students regarding Starfish.

Please don't hesitate to contact me if I can be of any assistance as you continue your research.

Sincerely,

John Trifilo
Associate Director, Early Alert and Support Programs
Pirate Tutoring Center

APPENDIX D: PARTICIPANT COMMUNICATIONS

From: Asby, Steven
Sent: Thursday, November 06, 2014 4:44 PM
To: starfishsurvey-l@listserv.ecu.edu
Subject: *RESPONSE NEEDED: STARFISH*
Importance: High
Dear Pirate,
My name is Steven Asby and am a Pirate doctoral student investigating student perceptions of ECU's
Starfish system. Starfish is an early alert system designed to inform students of academic progress,
connect student with appropriate campus resources, and support student success. If you would like more
information on Starfish, click here. To gauge how students feel about the system, I ask you to complete
the survey linked below:
https://ecu.az1.qualtrics.com/SE/?SID=SV_0wZ35df1hjSNjjD
I truly appreciate your support and thank you for your participation. In completing this survey you agree
to consent as mentioned in the attachment, which you can save for your records.
With great thanks,
Steven B. Asby, ECU Doctoral Student
From: Asby, Steven
Sent: Sunday, November 16, 2014 9:27 PM
To: starfishsurvey-l@listserv.ecu.edu
Subject: *2nd NOTICE: RESPONSE NEEDED*
Importance: High
Dear Pirate, last week you were invited to complete a very important short survey on ECU's usage of the
Starfish system (information on Starfish, click here). If you have not yet done so, please complete the
survey below:
https://ecu.az1.qualtrics.com/SE/?SID=SV_0wZ35df1hjSNjjD
If you have completed the survey, I truly appreciate your support and thank you for your participation.
With great thanks,
Steven B. Asby, ECU Doctoral Student

From: Asby, Steven
Sent: Tuesday, November 25, 2014 9:43 PM
To: starfishsurvey-l@listserv.ecu.edu
Subject: *FINAL REMINDER: Response Requested*
Importance: High
Dear Pirate, this is a final request that you complete the following anonymous survey (*Please ignore if
you have already completed*) on your thoughts regarding ECU's Starfish Early Alert System!
SURVEY LINK: https://ecu.az1.qualtrics.com/SE/?SID=SV_0wZ35df1hjSNjjD
I appreciate your participation in the important academic research at ECU. There is no need to reply to
this message. If you need more information on Starfish, click here.
Happy Thanksgiving,
Steven B. Asby, ECU Doctoral Student

APPENDIX E: PARTICIPANT CONSENT LETTER

Dear Participant,

I am a student at East Carolina University in the Educational Leadership department. I am asking you to take part in my research study entitled, Student Perceptions of Starfish.

The purpose of this research is to investigate student perceptions of ECU's Starfish system. By doing this research, I hope to learn what students think of Starfish. Your participation is voluntary.

You are being invited to take part in this research because you are an ECU student. The amount of time it will take you to complete this study is approximately 10 minutes.

You are being asked to complete an online survey based on the Starfish system at ECU.

Because this research is overseen by the ECU Institutional Review Board, some of its members or staff may need to review my research data. However, the information you provide will not be linked to you in any way. Therefore, your responses cannot be traced back to you by anyone, including me.

If you have questions about your rights as someone taking part in research, you may call the UMCIRB Office at phone number 252-744-2914 (days, 8:00 am-5:00 pm). If you would like to report a complaint or concern about this research study, you may call the Director of UMCIRB Office, at 252-744-1971.

You do not have to take part in this research, and you can stop at any time. If you decide you are willing to take part in this study, continue on with the survey below or check the AGREE box below and the research questions will appear.

Thank you for taking the time to participate in my research.

Sincerely,

Steven B. Asby, Principal Investigator