January 2015

A Quantitative Inquiry Into First Generation Students' Readiness For Distance Education

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A QUANTITATIVE INQUIRY INTO FIRST GENERATION STUDENTS' READINESS FOR DISTANCE EDUCATION

by

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A Dissertation
Submitted to the Graduate Faculty
of the
University of North Dakota
In partial fulfillment of the requirements

for the degree of
Doctor of Philosophy

Grand Forks, North Dakota
December 2015

This dissertation, submitted by Sherita Jo Love in partial fulfillment of the requirements for the Degree of Doctor of Philosophy from the University of North Dakota, has been read by the Faculty Advisory Committee under whom the work has been done and is hereby approved.

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Dean of the School of Graduate Studies

December 4, 2015
Date

PERMISSION

Title	A Quantitative Inquiry into First Generation Students' Readiness for Distance Education
Department	Teaching and Learning
Degree	Doctor of Philosophy

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Sherita Jo Love
December 3, 2015

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ACKNOWLEDGMENTS

Trust in the LORD with all thine heart; and lean not unto thine own understanding. In all thy ways acknowledge him, and He shall direct thy paths. ~ Proverbs 3:5-6

I would have never thought my paths would lead me from the warmth of Atlanta, GA (by way of Knoxville, TN) to the frigid snow of North Dakota and eventually to the heat of San Antonio, TX. Regardless of which leg of my journey I have traveled thus far, what was consistent was the supportive family and love God has blessed me with.

To my parents William and Angeleena Love: Thank you. Thank you for supporting me and encouraging me throughout this journey. Thank you for loving and believing in me even when you didn't always agree with my choices. Thank you for giving me the foundation and stability I needed to grow.

To my sister: LaQuisha Ezette Love…my pillar of strength, who brings out the fire and fight in me. Ever since we were children, and you carried me on your hip, you have stood strong and protected me. Even now that we are adults, I admire you for your strength and the way you live life to its fullest.

To my niece Haley and nephew Patrick: You two continue to bring me so much joy and hope. I'm very proud of you.

To my Knoxville Family: Aunt Barbara and Uncle Harold…thank you for helping me to see what matters and not allowing me to forget my roots.

To my extended Atlanta and Athens Family: My first mentors, Attorney Cassandra Penn, Attorney Musa Dan-Fodio, and Mrs. Audrey Loyal and Dr. Thomas Reeves. Thank you for seeing something in me that I didn't see at the time. I would not have even considered a Ph.D. program if it had not been for each of you.

To my San Antonio Family: Nick…All I can say is thank you. Thank you for your support, constant encouragement and helping me see the lighter side of life. You make my life interesting! Ms. Cynthia for reminding me of my focus, and Dr. Rina for providing a peaceful place to unwind when I needed it.

To my A&M Family: Special thanks to President Cynthia Matson, Dr. Tracy Hurley, Dr. Holly Verhasselt, Dr. Vivien Geneser, Ms. Pam Massey, Dr. Velma Villegas, Dr. Cheryl Kelsey, Dr. Edith Young, Dr. Vinaja, Ms. Jane Mims, Ms. Pru Morris, Professor O., Dr. Ernest Thomas, Ms. Chris, and all the College of Business Faculty, the College of Education and Human Development Faculty and the College of Arts & Sciences Faculty.

I'd like to also thank my dissertation committee, Drs. Van Eck, Weoi Hung, Steven LeMire and Lori Swinney for all of your guidance and support throughout this dissertation process. Thank you Dr. Hung for allowing me to conduct research with you. Thank you Dr. Swinney for all of your advice in classroom design and active learning spaces. Thank you Dr. LeMire for all of your help with the statistics!

Last but certainly not least, I'd like to specially thank Dr. Richard Van Eck for being my mentor and major supporter throughout this entire journey. From taking me to get a battery when mine had died the my first week in ND, to entertaining my family when they came to town, from the many talks and come-to-Jesus moments when you helped me focus, I could not have asked for a better committee chair and mentor. I hope that as I enter into the academy, I can pay it forward just as you and Sandy have invested into me.

Dedicated to my Brother, William Lenzie Love, III.

Although you couldn't physically make it with me through the end of this Ph.D. journey,

I know that you are here with me spiritually …still protecting…still guiding…still loving.

I love you, Bill.

ABSTRACT

First Generation Students (FGS) enrollment in post-secondary universities and colleges has increased. Many of the First Generation Students also enroll in distance education courses because of the flexibility and conveniences distance education courses provide. But are FGS ready to take distance education courses? Do FGS have the same level of non-cognitive skills and attributes as their Non-First Generation Student counterparts? This quantitative study sought to examine FGS student readiness for distance learning courses. Based on the results, recommendations for Administrators, Faculty and instructional designers were provided.

CHAPTER I

INTRODUCTION

Students in higher education have chosen the distance education option in ever increasing numbers in recent years. In fact, the percentage of college and university students who have enrolled in distance education courses in the United States has grown steadily since 2003. Millions of students are now enrolled in distance education courses and programs, and university administrators predict that the numbers will continue to increase in the years to come. According to the Integrated Post-Secondary Education Data System website, over 5,257,379 students were enrolled in either an online or hybrid/blended course or program in 2013.

The trend towards distant learning as a preferred format for coursework in higher education applies to all levels of the socio-economic strata. Both public and private non-profit institutions have reported impressive growth in enrollment for their distance learning options. According to *Grade Change: Tracking Online Education in the United States* (Allen and Seaman, 2014), total student enrollment in public institutions of higher education grew from 3,584,745 in 2012 to 3,750,745 in 2013, which depicts an increase of 4.6% in one year. Similarly, the total enrollment in distance education courses for private not-for-profit institutions increased from 684,030 in 2012 to 770,219 in 2013;

which depicts a 12.6% increase. In a recent report published by the Instructional Technology Council, the researchers Lokken and Mullins reported a 5.2% increase in student enrollment in distance education from 2012-2013, which is yet another notable gain (Lokken & Mullins, 2014).

With the advent of technological tools, educators and instructional technologists have been called to develop new formats for teaching and learning online in order to meet the needs of a changing workforce and society. Concurrently, higher education institutions have been experiencing a fundamental change in student demographics as more students seek the flexibility of instruction, course delivery and new options for class attendance that are characteristic of distance learning programs. The institutions of higher learning have responded by providing more online options for interested students such as the flexible online courses, blended/hybrid courses and the web-facilitated delivery method (Skopek & Schumann, 2008).

Students are attracted to distance learning courses and programs for a variety of reasons such as work schedules, concurrent external demands, and military commitments. In order to stay competitive in a global workforce environment, many students must pursue supplementary education through professional development courses, graduate school, or additional coursework (Moore & Kearsley, 2011).

According to the Bureau of Labor Statistics (BLS) (2015), the current trend for people is to have several careers over the span of their working years. Although it is not possible to predict the number of careers a person may have in a lifetime, the common tendency for workers to pursue more than one vocation has resulted in an increased demand for coursework to provide the essential educational requirements. Unlike earlier generations, the students currently enrolled in programs in higher education are not likely to have just one career. Thus, as students modify their career trajectories, they often have to remain employed while they are in school. As a result, they need access to the flexibility that is provided by distance education environments.

In addition to seeking the distance learning option for career-related reasons, students may also seek distance learning because of external factors and demands such as responsibilities to their families, concurrent employment, and geographic limitations. For example, active military students who have to frequently relocate often benefit from distance education. Regardless of the reason, whether it pertains to professional needs, external factors, or military status, many students require flexibility and choice in their educational options.

As a result of these societal changes, a corresponding increase in distance learning courses and programs is warranted, and this need has become critical to the long-term strategy for institutions of higher learning. Thus, according to *Grade Level: Tracking Online Education in the United States*, over 70% of public colleges and universities have responded to the call for an increase in digital options for learning (Allen & Seaman, 2014). Numerous institutions of higher education have responded to the changing needs of students in the twenty-first century. As a result, universities are investing a tremendous amount of money to develop solid technical infrastructures, provide faculty training, and hire specialized instructional support for faculty (Allen & Seaman, 2014).

Modes and Types of Distance Education

The specific implementation of the coursework for distance education programs varies according to the needs of the learners. One of the common denominators is the factor of disparate geographic locations so, to accommodate the off-campus model, two basic modes of course delivery have been developed: synchronous and asynchronous. Synchronous delivery is defined as instruction that occurs concurrently; when both the teacher and the student are online at the same time and engaged in interactions relevant to the content. In contrast, with asynchronous instruction, the interaction occurs at different times over the course of a semester, such as correspondence courses and classes that are offered in the independent study format. The synchronous and asynchronous modes can be combined or adapted in various ways to create several basic models of distance education.

Asynchronous Online Course Delivery

In an exclusively asynchronous online course delivery format, all of the course teaching and interactions between teacher-student, student-student and student-content will be enabled by technological tools. The defining factor of asynchronous course delivery is that students and teachers are never in the same location at the same time. The limitation of this mode is that students are less inclined to ask questions of the professor, to learn from each other in a face-to-face discussion forum, to fully engage in collaborative projects, and to meet their co-learners in real time. Although some may argue that this loss is offset by the flexibility of interacting at their own time and pace, it may still be considered a limitation of the format.

Synchronous Online Course Delivery

In the synchronous online course model, students have the opportunity to attend class without leaving their homes or place of employment (Butner, Murray, & Smith, 1999). However, the students must attend class at the same time as their classmates and professor. Through the use of web-conferencing tools such as *Blackboard Collaborate* and *Adobe Connect*, students have the option to attend class in any location that has an Internet connection. One limitation of this mode is the lack of a flexible time frame. However, consistent online interaction with other learners is beneficial for all of the participants.

Hybrid Course Delivery

In an attempt to overcome some of the shortcomings of synchronous and asynchronous online instruction, some distance education providers have opted to incorporate a blend of both modes for students. The option to provide this mode varies according to the institution, but it is usually at the discretion of the instructor and/or instructional designer. The content and activities are then delivered in combination with the selection of the technology guided by the instructional content, goals, outcomes and strategies (Lim, Morris, & Kupritz, 2014).

Blended Course Delivery

The blended distance education delivery model offers a format in which some of the students attend class in a classroom on campus, while other students connect via the synchronous technology tools. The advantage for the distant students is that they have access to classroom resources, while the students on campus benefit from diverse classmates who would otherwise never interact with them (Rovai & Jordan, 2004).

Hybrid-blended Delivery

As the name suggests, the hybrid-blended delivery model serves students who are able to utilize instructional resources both on and off of the campus. The professor provides instruction with a mix of synchronous and asynchronous activities and technology. In this model, the teacher generally sets the course schedule for the time to meet, as well as the duration of each session. During their class meetings, students interact online with other members of the learning community. In this format, the synchronous activities are mandated for successful completion of the course.

Hyflex Course Delivery

The hyflex course delivery model is another option that offers flexibility to students. The model is composed of four factors: learner control, accessibility, reusability and equivalent learning outcomes (Beatty, 2010). The students can select to participate in the synchronous format, or asynchronously via recorded files of the event. Additionally, students can access the equivalent course materials at any time through the Learning Management System or web-conferencing software.

In the implementation of this model, the schedule is not mandated. The instructor offers a flexible course attendance policy, and provides equivalent (comparable, but not exact) learning experiences for each of the modes of delivery selected by the student. Although this approach has been shown to be effective in increasing student satisfaction, engagement and access, it is a model that requires an increase in time for preparation and planning on behalf of the instructor, as well as an increase in self-regulation on the part of the student, both of which can be drawbacks (Beatty, 2007; Beatty, 2010).

Web-assisted Course Delivery

Perhaps more vague in nature and often used interchangeably with online courses, are the World Wide Web assisted classes. Various definitions can be found to describe these web-assisted courses, which are determined at the university, college, or department levels in institutions of higher learning. Web-assisted courses may include a combination of technology tools, face-to-face interactivity, and instructions. For example, an instructor may use an asynchronous online discussion board to continue to facilitate a debate that originated in a face-to-face environment. Similarly, a professor may also instruct students to complete online activities and assignments to supplement face-to-face instruction.

Comparison of the models. Universities provide choices in course delivery offerings that range from the rigidity of classes that are only available online to the hybrid/hyflex courses. From these options, the synchronous online courses offer the most flexibility. The synchronous courses feature instruction, activities and resources that are delivered completely online, but without the benefit of real time student-student and teacher-student interaction. Synchronous online courses provide social and interactive benefits, but are the least flexible for students with outside requirements. Hybrid, blended, and hybrid-blended courses may provide the most favorable option because the course activities are offered both synchronously and asynchronously, with and without on- and off-campus student interactions.

Many students appreciate the fact that distance learning courses provide flexibility and a manageable level of control over their learning, depending on the type of delivery method. For example, asynchronous courses are very flexible and may provide the learner with the best option, which is control over their learning. In contrast, web assisted synchronous instruction environments, though useful, provide students with perhaps the least control and flexibility, since they need to be present at the same time, if not in the same place, as mandated by the instructor.

Hybrid courses, which mix synchronous and asynchronous environments, offer a range of options, depending on the number of attendance and learning possibilities that are offered by the instructor. Regardless of the type of distance learning and attendance method, with learner choice and flexibility comes an increased need for students to manage their own learning path effectively, which is a task that encompasses multiple challenges.

After reviewing the various models for distance education, it is obvious that the topic of distance education pertains to a wide variety of instructional offerings rather than a uniform model for online coursework. Furthermore, each instructional model will vary in the presentation and implementation and will feature different requirements for student success. Although the student, as a consumer, will have some options in the choice of a format, the ultimate decision for selecting a compatible design for an online course will be at the instructor’s discretion.

Factors that Contribute to Student Success in Distance Education

Although student success can be defined in several ways, many common denominators have been found that contribute to overall student success in distance learning courses. According to one study of the available literature, which was conducted by Menchaca and Bekele (2008), the factors that determine student success for online programs can be organized into the following five categories: technology-related elements, course-related components, effects of the pedagogic approach, the influence of support services and the unique characteristics of the consumers of the coursework-the online learners. It is important to note that these factors can be interdependent, and will often influence each other (Menchaca & Bekele, 2008).

Technology-related factors. The choice of technology tools will, of course, play a critical role in the success of any distance learning program (Erlich, Erlich-Philip, &

Gal-Ezer, 2005; Salter, 2005; Weaver, 2008; Yan, 2006). Furthermore, the selection of the specific technology components will have an effect on the teaching and learning process. The innovative features and popular appeal of the tools as well as the online expertise of the course instructor will have a direct impact on the quality and level of interactions in distance learning environments (Kung-Ming & Khoon-Seng, 2005).

The selection of technology has an impact on the learner's experience in distance learning environments. The technological component of the online course must be user-friendly, reliable, and readily accessible from multiple devices and locations. The less dependable, user-friendly and reliable the technology is, the more problems students will have when attempting to use the technology. Consequently, technology will become prohibitive to the overall instruction, communication and learning process.

One of most common platforms in distance learning is the learning management system, or, as it is usually called, LMS. The LMS is a platform that serves as the foundation for more of the learner/teacher usage and application of other academic technologies. Researchers have found that the effectiveness of a Learning Management System is crucial to the success of an online course, so providing a solid reliable infrastructure is necessary to ensure the desired outcome. On the other hand, when students perceive a lack of support, or struggle with unresolved technical problems, they are less likely to sustain motivation to excel in the course. Ultimately, researchers have found that difficulties that cause a decrease of student motivation will contribute to a higher dropout rate (Baird & Fisher, 2013).

Learner/Teacher Use and Application of Technology

A symbiotic relationship exists between the selection of technology and its application and use, since the choice will have a direct impact on the instruction, communication, and interactivity. Many researchers believe that some of the more important aspects of effective teaching in online environments are interactivity and communication. Along with highlighting interactivity, they emphasize that it is not just teacher-student interaction, but also student-student and student-content (Moore & Kearsley, 1996; Moore & Kearsley, 2011; Soo & Bonmk, 1998).

As mentioned previously, when using technology, interactivity and communication can occur two ways in the distance learning environments: asynchronously and synchronously. Technology components that facilitate more asynchronous interactions include multimedia assessments and practice learning objects such as learner-content interactions (Beatty, 2010). Additionally, optional components such as discussion boards, blogs, wikis and emails can serve as supports for the online learning model (Hollis & Madill, 2006).

By using the synchronous tools, learners can participate concurrently with their classmates and instructor. The tools serve as a platform that can enable real-time communication and support teacher-student and student-to-student engagement. For example, two of the current technologies that incorporate chat features are the Learning Management System and an online web meeting platform, the Adobe Connect (Hollis & Madill, 2006).

Overall, the choice and selection of technology provides the context in which the technology is used by both the learner and the teacher, hence the interdependence. While the technology is behind the scenes, the choice and selection of technology has an influence on the overall student experience and success. Students who perceive that they have limited access or control over technology in distance education have reported higher levels of negative emotions, which naturally plays a role in both their course achievement and satisfaction (Butz, Stupnsiky, & Pekrun, 2015; Lehman, D'Mello, & Graesser, 2012).

Leadership Factors and Support Services

In an old Nigerian proverb, we hear that it takes a whole village to raise a child and, similarly, with distant learning we have found that it takes the support of a whole university to facilitate the success of student achievement in the distributed online learning environments. Financial support and prioritization of resources from university leaders, including presidents, provosts, CIOs, as well as key administrators, such as vice presidents, deans, and department chairs, are vital to student success in distance learning environments (Abel, 2005). Moreover, to fully develop a successful solid technical infrastructure for distributed learning, university leadership has to make adequate ongoing provisions and be prepared to commit funding for the appropriate resources. The resource categories will include both the obvious technological resources, as well as an abundance of human capital (Simpson, 2013).

Technological Resources

Regardless of the type or quality of interaction, the foundation of distance learning is the technology. The acquisition and ongoing maintenance of technical platforms such as learning management systems, web-based video-conferencing platforms, and streaming media servers necessarily require a significant investment of institutional resources. In fact, some researchers will define distance learning by the type of technology that is utilized for coursework. In addition to providing the basic technological tools, it is advisable for universities to consider supporting the inclusion of additional instructional resources such as web-based training materials, access to learning objects repositories and a variety of multimedia video collections (Anderson & Dron, 2010; Garrison, 1985; Nipper, 1989; Taylor, 1995).

Human Capital

As university leadership and administration invest in technologies to support the availability of distance learning, additional staff is needed to troubleshoot problems and support the logistics of maintaining the technology. The human capital required for successful implementation of a distance learning program include the addition of a solid support staff to facilitate the implementation and sustain providing instructional technologists to assist faculty in every department, professional development for faculty members, personnel assigned to support students, and support for the development of policies to ensure the success of implementation throughout the institution (Simpson, 2013).

In addition, trainers, instructional designers and multimedia developers are needed to teach the effective use of the technologies to other members of the faculty and staff. In fact, some researchers believe that effective instructional support from the technology experts on campus is the vital component to success in distance learning programs at the university level (Baker & Schihl, 2005; Garrison & Kanuka, 2004; Menchaca & Bekele, 2008).

Course Related Factors

In addition to support from leaders and a solid technological infrastructure, course design and quality assurance are important factors that contribute to student success. The instructional design processes that are currently in use include ADDIE (Gustafson & Branch, 1997), and Dick and Carey (Dick, Carey, & Carey, 2005).

Developers draw from a variety of resources. One prominent academic theorist, an American educational psychologist whose ideas support the implementation of distant learning, is Robert Gagné. His popular work: Gagné's Nine Events of Instruction is often cited in the distance learning research literature and has been used in a variety of online instructional formats (Gagné & Medsker, 1996).

Instructional technologists who have studied design processes and learning theories have successfully developed several commercial models for quality assurance in distance education. They have created programs such as the OLC's Five Pillars of Quality Online Education© (university/program evaluation) and the Quality Matters Rubric™ (course-level evaluation), which serve as standards and guidelines for effective course design.

Additionally, at the course level, factors that contribute to online learning success include setting clear expectations and learning outcomes. Obviously, clear course structure and organization with and relevant challenging and instruction are essential to the success of an online course (Abel, 2005; Menchaca & Bekele, 2008; Ostlund, 2008).

Pedagogic Factors/Learning Approach

Closely related to course design and structure are pedagogic factors, the learning approaches or strategies that are utilized in course instruction to present and engage students in the learning process and content. Menchaca & Bekele (2008) suggest that pedagogic factors will also have a substantial impact on student success. Pedagogic factors include student-centered learning techniques, ample avenues for communication and collaboration, and highly interactive problem-based learning activities that engage students in collaborative projects that involve problem solving tasks and activities to construct meaning (Menchaca & Bekele, 2008).

Anderson (2009) compares the compelling task of selecting technology and pairing it with engaging pedagogical instruction to a dance, with similar challenges and rewards. In a similar way that the choreographer directs the dancers to perform sweeping motions, with many graceful extensions and enduring emotional embraces, the instructor of an online course facilitates a multi-faceted range of opportunities for expression and productivity. Together, technology and pedagogy can reveal and develop our human creativity and responsiveness and allow us to learn effectively and enjoyably (Anderson, 2009).

Similarly, pedagogy for technological venues can be considered analogous to composing music in that setting the tempo, the beat, the timbre and the corresponding melodies requires careful and creative planning and preparation. In an extension of this analogy of distance education to other teaching formats, the pedagogy could be replaced with creative tools for effective implementation. A variety of successful instructional design models are already available and many more are in progress. Several of the proven models include ADDIE (Gustafson & Branch, 1997), Gagné's Nine Events of Instruction (Gagné and Medsker, 1996), and the Dick and Carey Model (Dick, Carey, & Carey, 2005). Furthermore, many established learning theories such as situated cognition (Lave

& Wenger, 1991); and problem-based learning (Jonassen, 1999) have been successfully utilized in the context of distant learning programs.

User Characteristics or Human Factors

While collectively the myriad of factors such as technology, leadership, course content, and pedagogic practices are related to the attainment of skills and knowledge in the distance learning environment, the most important element is the human factor. In this context, the term human factor pertains to the individual online student and his or her unique attributes. As such, the human factor will be the overriding key to the ultimate outcome of any distant learning course.

In order to thrive in the distance education environment, students must obtain a new set of skills, which are in contrast to the skills needed in traditional face-to-face environments (Schumacher, Englander, & Carraccio, 2013). Generally speaking, prior experience, technical knowledge, attitude, and motivation each have a huge impact on student success in distance learning environments just as they do in traditional learning environments. Often, students who have experience in distance learning environments will be more successful than students with limited or no experience. However, lack of experience should not be a determining factor when considering an online course. Students' attitudes and motivations for enrolling in distance learning environments also play a role (Abel, 2005). With proper support from an instructional staff and ample opportunities for increasing one's technological abilities, each student should be able acquire the necessary skills for success in this format (Erlich, et al., 2005; Shih, Muñoz, & Sanchez, 2006; Yan, 2006).

Student Factors that Contribute to the Success in Distance Education

After an initial surge of interest for the online format, enthusiasm waned and, more recently, enrollment in university distance learning programs across the United States began to decline (Allen & Seaman, 2014). Despite impressive efforts to establish distance learning infrastructures, many administrators acknowledge the decline in student retention in the distance learning courses. Consequently, they have expressed concern about student learning outcomes and grades. The decline in growth could be attributed to the fact that this unique system for learning grew too fast, too soon, and, as a result, has not produced the desired evidence of student success. Thus, in an effort to increase student success and retention, the focus is now shifting to assessing student readiness and identifying barriers to success for students in distance learning environments.

Researchers have identified many factors that are barriers to success for students enrolled in distance learning courses such as: lack of self–regulation skills, lack of an understanding of the expectations of the online format, ineffective time management skills, limited access to technology, and lack of appropriate systems for support. Barriers may also include difficulties managing the demands of distance learning due to employment and family obligations. Time management and lack of support appear to be even greater issues among the at-risk populations, including both first-generation students (FGS) and non-first-generation students (NFGS) (Moore & Kearsley, 2011).

Student Success Factors in Distance Learning

Arising from my aspiration to improve the online learning format in general, as well as my desire to advance the options for distance learning on my campus, I chose student success, specifically readiness to succeed, as the primary focus of this study. To elaborate on this topic, I have identified five key areas that play a significant role in student success in distance education: motivation, self-efficacy, self-regulation, locus of control, and time management.

Motivation. Motivation can be defined as the desire to perform, or having a voluntary reason for performing a certain action (Ley, 2005). In higher education, motivation to perform as a student can be cited as the initial reason for enrolling in courses in a degree program. Correspondingly, as part of the desire to complete a degree, motivation may be seen as the pervasive reason for continuing with the instruction at the lesson, course, and degree levels (Abel, 2005; Lammintakanen & Rissanen, 2005).

Increasingly, one of the driving motivations for seeking out distance education is the appeal of the flexibility and convenience of class schedules. Commonly, students are motivated to enroll to develop skills for new or continued employment (Moore & Kearsley, 2011). Since adults often change jobs during their work life, additional education may be needed, hence another type of motivation to return to school.

In terms of student success, what may be most important is the overall strength rather than the source of the reason that the student has selected distance education. Research has shown that those who have weak motivation tend to dropout, have a lower GPA, and become less engaged than those with strong motivation (Miltiadou & Savenye, 2003; Rovai, 2002; Sankaran & Bui, 2001). Although there are various reasons why students enroll in distance learning courses, including geographic distance, availability of local educational resources, or inability to attend in person due to a form of disability or incapacity, the student’s motivation to complete the coursework and their perseverance in pursuit of that goal will be an important determinant of their eventual success.

Self-efficacy. Motivation is a strong predictive factor for student success in online learning, yet it is not the only one. Many adults who are motivated to attend school to further their earning potential and job advancement may be hindered by negative beliefs about their ability to be successful due to low feelings of self-efficacy (Severino, Aiello, Cascio, Ficarra, & Messina, 2011). Self-efficacy is defined as one's perception of personal competence. The concept of self-efficacy encompasses one's ability to master a range of competencies such as organizational skills, task completion, or the achievement of desired learning outcomes (Bandura, 1997; Schwarzer, 1993; Zimmerman, 2002).

People with high self-efficacy demonstrate higher levels of motivation to attempt difficult tasks even when faced with obstacles and, likewise, are able to recover rapidly when they make mistakes (Bandura, 1994). Individuals who have lower levels of self-efficacy are more likely to have a negative perception of challenges and to give up sooner when faced with obstacles. They also tend to have low expectations for themselves and may express self-doubt in their ability to successfully complete a challenging task or solve a difficult problem (Bandura 1994; Yunus, Suraya, & Wan Ali, 2009; Yusuf, 2011). A high sense of self-efficacy is helpful when taking distance-learning courses, because the asynchronous nature of some courses may require more independent study and work.

Researchers assume that more experienced learners are believed to be better at self-regulating during the learning process (Bandura, 1986). Seeking help, which is a normal response when faced with a challenge or ambiguous task, is another component of self-efficacy. Students who have robust tendencies towards self-efficacy are more likely to seek help when a problem seems too complicated because they are able to admit their need for guidance without feeling embarrassed. Whereas much of the communication is enabled by the use of technology in the ways of discussion boards, emails and blogs, if one has technical issues or a lack of technical skills, communication can be compromised. However, a student who is resilient enough to acknowledge his or her lack of skill in this arena will also be adept at seeking assistance in order to master the necessary skills.

Self-regulation. Closely related to the theme of motivation and self-efficacy is the concept of self-regulation (Ley, 2005; Keller, 1987). The term self-regulation pertains to a self-directed process by which learners transform their cognitive abilities into academic skills (Zimmerman, 2002). Self-regulation requires the development of key processes like goal setting and time management (Bandura & Schunk, 1981; Schunk, 1995; Zimmerman, 2000). In distance learning environments, especially in models with asynchronous components, self-regulation is critical because of the limited teacher-student or student-student interaction when compared to face-to-face courses (Jonassen, Davidson, Collins, Campbell, & Haag, 1995; Uzun, Unal, & Yamac, 2013). Other researchers have found a relationship between strong self-regulation and higher academic achievement distance learning (Azevedo, Buthrie, & Siebert, 2004; Chang, 2007; Thompson, Meriac, & Cope, 2002; Whipp & Chiarelli, 2004). While there are other variables to student success in distance learning courses, students who demonstrate the ability to self-regulate, are more likely to be successful in distance learning classes (Schunk & Zimmerman, 2006).

Locus of control. Self-regulation ability can be affected by another factor shown to be important in educational environments: locus of control. Locus of control is defined as a general internal belief about whether the individual or the environment has more control over what is happening in a given situation. Learners may possess either an internal locus of control or an external locus of control. People who function with an internal locus of control are more likely to believe that they can influence what is happening, while those with an external locus of control have a tendency to blame outside forces for their situation (Fazey & Fazey, 2001; Rotter, 1954).

With an external locus of control, people are likely to believe that their actions and efforts will have little or no impact on their world. It becomes critical in academic settings when they are facing obstacles and challenges because, when students who believe that outcomes are more the results of external forces (such as an unfair teacher or technical problems), they perceive themselves as having very little control over academic achievement and are less apt to persevere (Severino et al., 2011).

By contrast, students who portray an internal locus of control demonstrate the ability to take responsibility for their attitude and actions. They believe that they can overcome obstacles such as those faced in educational environments through individual efforts and then take the initiative to solve problems (Rotter, 1966; Zimmerman & Schunk, 2003).

The student's ability to develop an internal locus of control is an especially important factor for success in distance learning environments, because many of the activities are self-directed. Learners are expected to work independently, with tasks such as managing reading schedules, homework assignments, and project timelines.

Time management. Time management is imperative to success in distance learning courses. Students must be able to effectively manage their time in order to meet the obligations of online courses. Effective time management can be challenging to achieve in asynchronous or hybrid distance learning classes because unlike face-to-face environments, the instructor is not physically present and may not be constantly monitoring and prodding to check the status of projects or assignments. Furthermore, there may also be a lack of social pressure that might normally prompt students to think more about assignments and progress during the semester (Chmiliar, 2011).

Many students find it difficult to effectively manage their time and maintain overall organization. One reason could be the presence of competing demands on an already busy schedule, which is common in students who are more apt to enroll in distance learning courses because of the flexibility options (Chmiliar, 2011).

The Changing Face of College Students

Generally speaking, factors that contribute to student success, as discussed previously, apply to all students who are enrolled in distance learning course; however not all students are the same. In a perfect world, all students would be highly motivated, self-regulated with a high sense of self-efficacy, and have an internal locus of control. They would also possess effective time management skills and be regulated and confident enough to seek help when needed and fully disclose any issues they may be experiencing in the classroom. However, this is not the case; much depends on the nature of the individual student as well as a host of other differences that must be considered when evaluating student readiness for distance education.

Non-traditional Students

Research reveals that the characteristics of a typical college student have significantly changed in the past two decades, which has also coincided with the advent of online learning options. In the literature that addresses the transformation of our institutions of higher learning, much is written about the ambiguity and inconsistent definition of non-traditional students No longer are they likely to be single, Caucasian females or males between the ages of 18-21 with an upper middle class socio-economic background who attend four-year institutions as residential students (Chung, Turnbull, & Chur-Hansen, 2014; Greenland, 1993).

Over the past twenty years, the population of college and university students has changed significantly. Currently, many non-traditional students are married, employed full-time and are non-residential students. Many of them transferred from two-year colleges into the four-year institutions (Gilardi & Guglielmetti, 2011). Because of the overall shift in the characteristics of traditional students, the term non-traditional student is less clear. As such, the term adult learners will be used in lieu of non-traditional students.

Adult Learners

In a recent study, researchers discovered that many of the students who were enrolled in distance education were at least thirty years old, or even older when they took their first online course (Parker, Lenhart, & Moore, 2011). According to Knowles' (1978) theory of adult education, often referred to as andragogy, adult learners possess the following traits:

- Prefer to feel like they have some control over that is happening around them

- Prefer to learn in a more constructivist manner vs. behavioral and like to be able to make decisions for themselves vs. being told what to do.
- Prefer to learn from other students, not solely from the instructor
- Typically bring a vast amount of personal and professional experience to the learning environment
- See learning and information gathering as a necessity for solving problems; discard irrelevant information
- Often times have intrinsic motivation and voluntarily seek learning opportunities

While adult learners in general have their own set of individual differences, they themselves are not a homogenous group. Increasing subsets of adult learners who enroll in distance education are FGS, who have an entirely different set of traits and characteristics (Bui, 2002; Choy, 2001).

FGS and Academic Success

Oftentimes, researchers and practitioners categorize First Generation Students as non-traditional students. For the purpose of this study, FGS are defined as students whose parents did not attend college and/or did not graduate from college (Bui, 2002; Choy, 2001). It is important to understand the unique characteristics and backgrounds of this subset of learners in order to ensure that all students have an equal chance to be successful in distance education. Otherwise, we run the risk of creating a new digital divide in access to continuing education. FGS typically earn lower grades, take fewer classes, and encounter more obstacles than non-FGS (Bowen, Kurzweikl, &Tobin, 2005; Housel & Harvey, 2009; Pascarella, Pierson, & Sirin, 2005; Stephens, Hamedani, &

Destin, 2014; Terenzini, Springer, Yaeger, Pascarella, & Nora, 1996; Wolniak, & Terenzini, 2004).

Typically, students who fall into this category are more likely to drop out of school (Aston & Bekhradnia, 2005; Roberts, 2011). FGS are also most likely to need a solid sense of community, which is in contrast to the independent mentality of younger students in higher education institutions (Stephens, Markus, Fryberg, Johnson, & Covarrubias, 2012). For example, in the Stanford University Student handbook, students are told clearly that it is not the job of their advisor to tell students what to do; advisors should be seen as a compass not a road map (Stanford University, 2004). Couple this university belief with the fact that many FGS have very little experience navigating the university waters and you will see that they need all the help they can get.

FGS and Distance Learning

As previously discussed in this chapter, technology is the core of distance education. With the onset of technical advances in web-based web conferencing tools, one could also add internet access (Van Dijk, 2006) to the core foundation. But what if, students do not have access to technology? Or, what if students have access to the technology but do not have access to high speed internet, or do not possess relevant skills to use the internet as it relates to higher education? The prevalence of these issues is commonly referred to as the digital divide (Prensky, 2001; Norris, 2001; Servon, 2008) or as digital inequities (DiMaggio & Hargittai, 2001; Mossberger, Mary, Tolbert, Stanbury, 2003). One could assume that if FGS come from economically disadvantaged backgrounds, they may be among the population that experiences digital inequities.

To add to the complexity, FGS also face additional cognitive and non-cognitive challenges when taking distance education courses. As discussed in the previous section, if FGS are more likely to be isolated in a traditional face-to-face environment, how will they fare in distance education environments where often times students who are not necessarily FGS feel alone? As more non-traditional and FGS are enrolling in distance learning environments, they bring other factors and barriers that have been prohibitive to success and retention (Saenz, Hurtado, Barrera, Wolf, & Yeung, 2007).

It is important to not only understand the basic factors that contribute to student success and retention in distance education environments but also to examine the characteristics of the students who are enrolling. It is the responsibility of the university program to assess the new students and find out whether they are adequately prepared to manage the flexibility and the requirements of the course design of distance education environments.

To compound the traditional barriers to success in distance learning classes, first-generation, non-traditional students have to deal with even more issues such as:

- Limited self-monitoring/self-evaluation
- Lack of parental guidance (parents have never attended college) (Choy, 2001)
- Low self-efficacy
- Inexperience with this mode of learning, which, combined with their unwillingness (or lack of knowledge) to seek support services such as tutors and technical assistance, compounds their problems (Hertel, 2002; Stephens et al., 2012; York-Anderson & Bowman, 1991)

- Concurrently working one of more jobs to support college education (Phinney & Haas, 2003; Warburton, Bugarin, & Nunez, 2001)

Given the additional barriers listed above, the overall success rate for non-traditional, FGS may be lower in comparison to the general population of students taking online or hybrid courses. The question now arises, how ready are non-traditional students and FGS to succeed in distance learning courses and programs?

Purpose of the Study

The purpose of this study is to examine the factors that impact academic success in flexible distance learning environments in higher education for non-traditional and first-generation students. The pace of distance learning development is rapid and the needs of students in general are changing. At the same time, it is hard for institutions to know what works best in terms of flexibility and overall student success. This challenge is exacerbated for first-generation students, and even less is known about meeting these challenges than for students in general. Therefore, it is critical for research to examine the issues of flexibility, learner control, motivation, and academic success in order to improve offerings and support for all students, but especially for FGS.

The following research questions will guide this study:

R1: How do FGSs and non-FGSs differ in terms of student readiness?

R2: What relationship is there between student readiness and success in online and/or hybrid courses?

R3: How do FGS and non-FGS differ in terms of the relationship between student readiness and success in online and/or hybrid courses?

It is my hope that by gaining a better understanding of the unique needs of non-traditional, first generational students, universities will be able to provide the level of services and infrastructure to support their learning and empower them to be successful in distance learning environments.

CHAPTER II

REVIEW OF LITERATURE

The purpose of this chapter is to outline in more detail the main areas that contribute to this study of first generation adult learners' readiness for distance education courses. The review of literature will focus on three primary strands of research to better conceptualize this study. The first section of the review is focused on distance education environments, including the evolution of distance education and different types of distance education courses delivery methods. The second section shifts the focus to student factors for success in distance education courses, including specific academic and individual attributes, technology related factors and external life factors and influences. Finally, the last section will focus on first generation college adult learners, their unique characteristics and how they compare to the success factors in distance education courses.

The Evolution of Distance Learning Environments

Distance Education has become an integral part of the global educational system, reaching into K-12 environments and higher education environments alike. According to a recent report by Allen and Seaman (2014), online course enrollments account for 33% of all higher education enrollments, with over 7.1. million studnets enrolled online. The increased demand and growth for distance education, has created a paradigm shift in higher education due in part to the many advances in technology coupled with the increased demand for education. Technological advancements have made distance education more accessible, thus allowing students who would not have been able to attend (Allen and Seaman, 2014).

Higher education institutions have focused on developing solid technical infrastructures to support distance education for years. Recent technology advances have made distance education course deliveries more accessible, convenient and flexible for working adult learners. As a result, more adult learners are returning to school or entering school for the first time and enrolling in distance education classes and a growing subset of this group are first generation adult learners (FGS).

The evolution of technological advancements hashad a tremendous impact on the growth and development of distance education (Jones & Knezek, 1995). According to Moore & Kearsley (2011), distance education as we know it is actually in its fifth generation (see Figure 1).

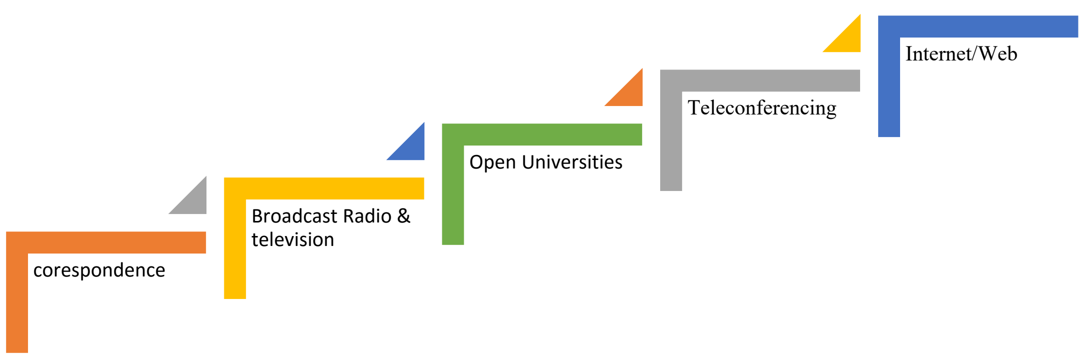

Figure 1 the evolution of distance learning (Moore & Kearsley, 2011)

The first generation began in the 1880s with correspondence and independent study courses where the content and exchange of information was delivered through the mail. Corporations and the armed forces alike, utilized correspondence courses to train their employees and soldiers. The type of instructional delivery system was mainly correspondence (Jones & Knezek, 1995) with limited interactivity between instructor and learner (referred to hereafter as instructor-learner interaction) except through content sent through the mail. The majority of the interactivity was between the content and the learner (content-learner interaction). Content at the time was limited to paper-based documents which included text and drawings. The delay of contact between the instructor and learner was quite significant mainly because of the method of delivery, which also limited meaningful interaction (Jones & Knezek, 1995).

With the invention of the radio, and later, the television, the second generation of distance education removed the limitations of distance and delay, and added the spoken word and moving images to the learning process. This helped to improve content-learner interaction somewhat, but did not increase instructor-learner interaction or learner-learner interaction. Learners also had a very isolated experience with limited academic support from the institution providing the instruction. Learners who enrolled in various courses or programs during the first and second generations of distance education were expected to have a certain level of independence, self-regulation, and effective time management skills in order to be successful; traits that as we will see later, remain key indicators of students readiness for success in distance education.

Until the 1960s, most of the distance education courses and offerings were isolated and disconnected in nature. While many opportunities for courses existed, they were unconnected to each other, could not be assembled into a single course of study or degree, and were fragmented, incomplete, and redundant in many cases. With the third generation of distance education, however, this began to change.

In 1964, at the University of Wisconsin, Charles Wedemeyer created the Articulated Instructional Media Project (AIM). With the AIM project, instructors connected short sessions and courses with various communication technologies such as radio, television, recorded audio tapes, and telephone conferences to deliver a more cohesive instructional curriculum (Moore & Kearsley, 2011; Wedemeyer & Najem, 1969).

In addition to these new communication methods, home kits for experiments, printed study guides and tutoring through correspondence were also made available to the distant students. The overall goal for the AIM project was to deliver "high quality –low cost teaching to off-campus students" (Moore & Kearsley, 2011, p. 32). Wedemeyer also empowered the students by giving them the option to decide which type of materials they would use according to the manner in which they learned best (Wedemeyer & Najem, 1969). The perceived benefit of learner choice assumed that the learner had enough self-awareness to not only know how they learned best, but also how to select appropriate materials and where to seek help when needed. Such flexibility was popular then and today, but the assumption does not necessarily hold true for all learners.

Beginning in the 1970s, advancements in technologies such as satellites and interactive two-way video conferences, provided a higher level of teacher-learner and learner-learner interactivity at a distance, ushering in the fourth generation of distance education. During this time, many universities also formed academic consortiums, which were systems of shared technologies and networks to deliver instruction from one university to other local and state universities.

One of the main benefits of fourth-generation distance education was the increased teacher-learner and learner-learner interaction. Students were no longer as isolated as they once were with correspondence-based instruction because they could interact in real time with other students. Students still could not easily attain a degree, however. Although there were some for-credit courses, many of these courses remained non-credit, professional continuing education courses. The technologies that were used were still limited in that video conferencing was sporadically available, expensive, and often of poor quality, which diminished the benefits of teacher-learner and learner-learner interaction.

Experts suggest that we are now in the fifth generation of distance education, which includes the use of computer and Internet-based virtual classes. Unlike the fourth generation of distance education, where students had to be physically located in a specified location in order to view and participate in interactive courses using satellites and two-way video conferencing, students in fifth generation distance education now have the convenience of attending courses from the comfort of their own homes using the Internet and personal computers and devices. Teacher-learner and learner-learner interaction are now higher than in any previous era, approaching the power of traditional, face-to-face instruction, but with the flexibility to work asynchronously as well on tasks that do not require such interaction. With all the potential that the technology of fifth generation distance education brings, however, the potential of creating isolated student environments similar to those of the first and second generation distance education remains.

Defining Current Distance Education

Distance education can be used to describe the distance or proximity between instructor and learners in an educational environment (Barker, 1988; Garrison & Shale, 1987; Palloff & Pratt, 1999) or it can be defined as a collection of teaching methods and strategies used to teach students at a distance and/or different times (Moore, 1990; Portway & Lane, 1994). For the purposes of this study, distance education is a collective term describing both teaching and learning at a distance and/or at different times (Keegan, 1996; Moore & Kearsley, 2011;). In order to operationally define this term further, however, it is necessary to delve more deeply into various modes and models that current distance education technologies have led to.

Asynchronous & synchronous components. In the previous section, we saw how the evolution of distance education proceeded from limited learner-learner and teacher-learner interaction with coorespondence courses (first generation) to modern day tools like discussion boards, wikis, two-way teleconferences courses, and chat and video teleconferencing (fourth and fifth generations). Yet, with the changing technologies, distance education at its core remained the same; technologies merely provided

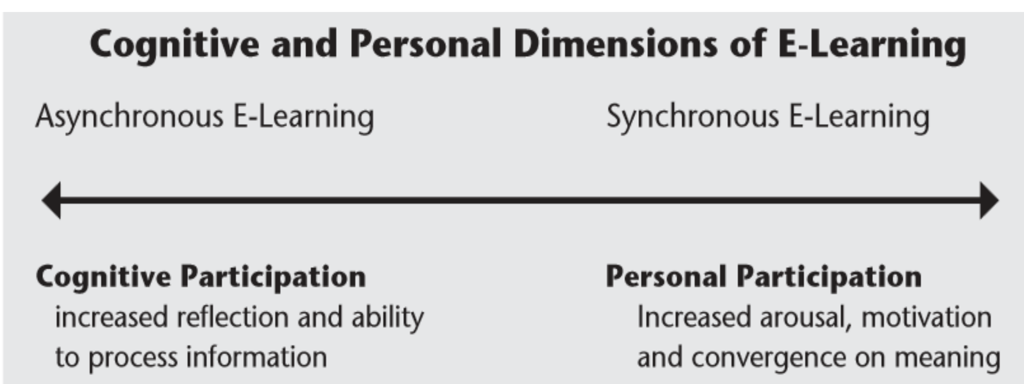

Figure 2. Cognitive and personal dimensions of distance learning (Hrastiniski, 2008)

affordances that changed how distance education was delivered. At the heart of these affordances lies the timing in which students learn and interact with the teacher and each other. In all generations, learners were able to learn on their own independently (asynchronously), with a high degree of flexibility to learn at their own pace (Hrastinski, 2008).

As distance education evolved, tools and technologies allowed the instructor and the students to particpate (though at a distance) at the same time (synchronously). Researchers have argued that this increase in synchronous learning components has led to increased motivation to respond because of immediate feedback and more opportunities to construct meaning within a social context, but less complex information changes because there is little time to reflect or process information (Hrastinski, 2008).

In contrast, asynchronous learning potentially leads to more cognitive particpation because learners have more opportunity to reflect and process the information before particpating, yet perhaps with less motivation to respond because of delayed feedback and the lack of a social context .

There are advantages and disadvantages to each approach, depending on the learner and their skill-sets and attributes. For working professionals or students who have competing commitments, asynchronous learning may work best because it enables students with choice and flexibility. However, it requires more motivation, self-regulation, and time management skills to be successful because there are fewer social pressures from peers or the instructor. If students need immediate assistance or further explanation on a particular topic, there may be a delay before the teacher answers an email or discussion post. Synchronous learning, on the other hand, limits the flexibility of participating at one's own pace, yet has the advantage that students are able to communicate and interact with both teachers and other students. However, this lessened flexbility may be benefical for less experienced students or First Generation Student, as they often do not know how to effectively navigate higher eduational environnments.

Modes of distance education. Distance teaching, in contrast to distance eduction, refers to the type of delievery method being used. Each of the technologies discussed to this point can be combined in synchronous and asynchronous ways to provide a mode of teaching. And with the advent of now being able to record and store lectures and class sessions, even synchronous instruction can be viewed asynchronously at a later time. While there are many different names for the models of distance teaching used in distance education, this study relies the interaction of three factors to define six primary modes of distance education. These factors are the timing of course interactions (synchronous/asynchronous), the location of students (distance or on-campus), and access to recorded synchronous materials. These factors alone and in combination result in five different models: Asynchronous only (different place, different time), synchronous only (different place, same time), hybrid (asynchronous and synchronous, mixed), blended (on-campus and distance students in the same course), hybrid-blended (a combination of these two models), and hyflex (hybrid and/or blended with recorded synchronous materials).

As we saw from chapter one, there are several modes of distance education based on the location of the learners, the inclusion of synchronous activities, and the role of learner choice in managing multiple, equivalent options. Regardless of the type of distance teaching delivery method, interactivity plays a crucial role (Hillman, Hills, &

Gunawardena, 1994; Moore, 1989). Moore (1989) defined interactivity as three forms – learner/content, learner/learner and learner/teacher. Learner-content is how a student gathers and gains knowledge from couse content (e.g. videos, presentaitons, articles). Dating back to the correspondence courses in the 1880s, learner-content interaction is perhaps one of the oldest form of interaction in distance eduation (Moore, 1989). Because of the independent nature of leaner-content interaction, researchers argue learners are having an internal conversation where students talk to themselves about the content (Holmberg, 1986; Moore, 2011). Because of the independent nature of learner-content interaction, which occurs in many exclusively online courses, a high level of self-regulation and motivation may be required of the learner.

Unlike the lack of human connection with learner-content interaction, learner-teacher interaction is the dialogue that occurs between learner and teacher in distance education. This is possibly the most sought after interaction in distance education (Moore, 1989) in that studies show that the more learner-teacher interaction within a course, the more satisfied the learners are with the course. Whether a student is not performing well or performing very well, a teacher can interact with the student to encourage and motivate the student to do better or to keep up the good work. This type of interaction also lends itself to communication and, if done frequently enough, discourage failure and attrition.

Rooted in social constructivism (Berger & Luckmann, 1991), learner-learner interaction is how one constructs and develops knowledge in a social context from communicating with their peers with or without the teacher being present. Learner-learner interaction can be extremely valuable to the learning process. According to Moore

(1989) and Phillips, Santoro, and Kuehn (1988,) it is essential especially in regard to motivating learners.

In the previous section, a general overview of distance education was provided, including the types of delivery methods, teaching methods and importance of interactivity. Shifting from higher level course design and delivery, this section will focus on the student and detail factors, including motivation, that contribute to overall success in distance education. University administrators are faced with the task of assessing the level of learner readiness to take distance education courses. Before examining student factors and characteristics for readiness, it is important first to examine the history and evolution of distance learning and interactivity.

Student Factors that Contribute to Success in Distance Education

Research has shown that, when well designed, there is no significant difference in learning outcomes among distance education delivery systems or traditional methods (Hoch & Doughe, 2011; Kummerow, Miller, & Reed, 2012; McLaren, 2004; Neuhauser, 2002; Pribesh, Dickinson, & Bucher, 2006; Russell, Carey, Kleiman, & Venable, 2009; Sussman & Dutter, 2010; Tallent-Runnels et al., 2006; Tucker, 2001). Assuming this is true, and excluding other factors such as teacher attitude, experience, and overall course design, then why do some students perform better in distance education, while others fail and eventually drop out all together? Perhaps this can be attributed to other factors such as student academic traits, external life factors, influences and technical fluency.

Student academic and individual attributes. There are many student academic and individual attributes that contribute to academic success in distance education (Artina

& Stevens, 2009). For this purposes of this study these factors are cognitive and behavioral in nature and very unique to each individual student.

Motivation. Motivation influences how, what and when we chose to learn (Schunk, 1995). As briefly discussed in the introduction, work related advancement is one of the main motivators for learners to enroll in distance education courses (Moore & Kearsley, 2011). Motivation is not a one-time state which occurs at the beginning of course enrollment; motivation fluctuates over time and throughout the duration of the course. Motivation is a key factor in learning and achievement in both face-to-face (Brophy, 2010) and distance education environments (Jones & Issroff, 2007). In contrast, low motivation is often linked with high drop-out rates (Muilenburg & Berge, 2005).

Intrinsic vs. extrinsic motivation. According to the Self-Determination Theory (Deci & Ryan, 1985), motivation ranges from amotivation (no motivation) to extrinsic (affected by external influences) and finally, intrinsic (affected by internal reasons). Built on the foundation of leaner autonomy (Hartnett, George & Dron, 2011), self-determination theory professes that all students have the intrinsic need to have a sense of purpose and control; in addition, all students feel the need to feel capable and connected, especially in online environments.

While all students have the previously mentioned needs according to the theory, not all students are alike. Some are more intrinsically motivated, do not need outside incentives and are very self-determined such that if rewarded externally, they may lose some of their motivation (Deci, Koestner, & Ryan, 2001). Others, including First Generation Students, are more highly externally motivated. Students who fall under this category are motivated by getting good grades, and eventually earning a degree (Hartnett et al., 2011).

Extrinsic motivation can be further broken down into two categories – external regulation (actions fueled by reward or threats of punishment) and identified regulation (actions fueled by the result of having personal value or personal joy (Brophy, 2008); what makes identified regulation classified as an external motivation is because the perceived value can be subjective to choices made by the teachers (Brophy, 2008; Hartnett et al., 2011).

As students enter distance education environments and courses, it is important to note that student motivation can change from chapter to chapter or module to module. Despite the different types of extrinsic and intrinsic motivation, a key constant is that students with amotivation are less likely to engage and therefore more likely to leave the course all together (Brophy, 2008; Hartnett et al., 2011). This is especially important for FGSs, as we will see later in this study.

Self-regulation & time management. Hartnett et al. (2011) have argued that all students have an intrinsic need to feel in control. A larger, somewhat symbiotic, component of control and motivation is self-regulation which is very important to student learning and academic performance (Corno & Mandinach, 1983; Corno & Rohrkemper, 1985; Moore, 1972, 2007). Self-regulation is not one simple factor but rather a set of factors including self-awareness, self-motivation, and behavior skill-based processes and strategies which learners continuously apply to each learning experience or assignment (Zimmerman, 2002, p.66):

(a) setting specific proximal *goals* for oneself,

(b) adopting powerful *strategies* for attaining the goals,

(c) *monitoring* one's performance selectively for signs of progress,

(d) *restructuring* one's physical and social context to make it compatible with one's goals

(e) managing one's *time use* efficiently

(f) *self-evaluating* one's methods,

(g) *attributing* causation to results, and

(h) *adapting* future methods.

A student's level of learning has been found to vary based on the presence or absence of these key self-regulatory processes (Schunk & Zimmerman, 1994; 1998; Zimmerman, 2002)

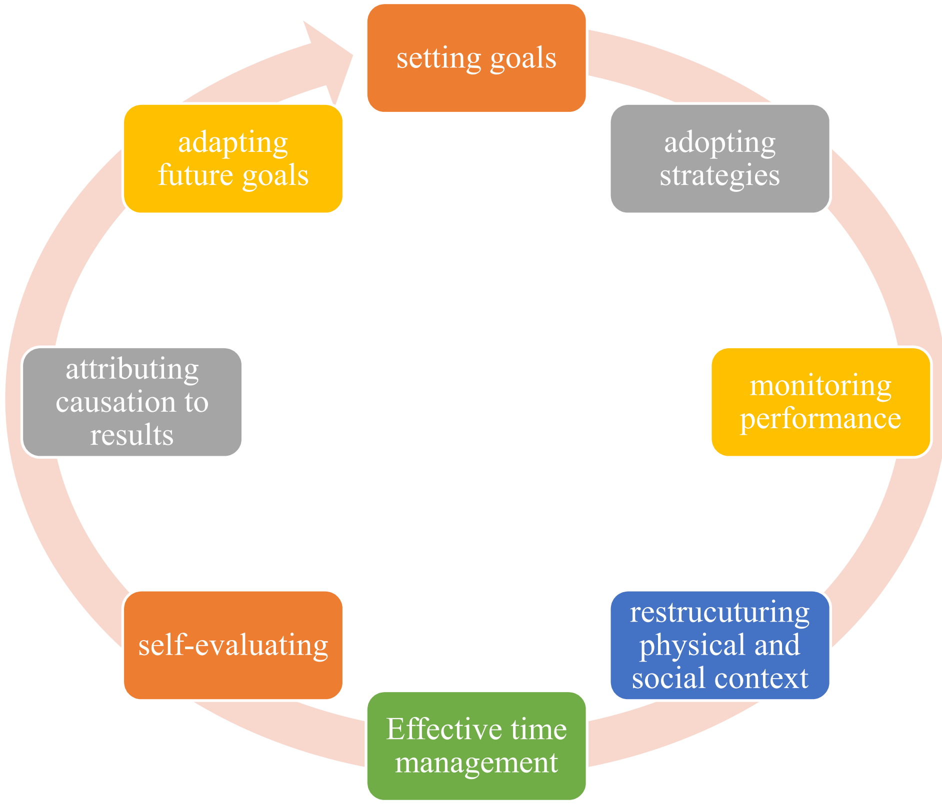

Figure 3 Self-Regulation Process- 8 steps (Zimmermann, 2002)

Earlier, it was stated that one of the benefits of distance education is learner choice and flexibility in how, where, when and at what pace to learn. High self-regulation is one of the contributing factors to success in managing distance education environments, especially where choice is a significant feature. When students display high self-regulation, they have greater chances for success. However, according to McPherson & Zimmerman (2002), first-time learners with low-self regulation typically perform poorly in distance education environments (as they do in all learning environments). Furthermore, without extrinsic motivation and influences from teachers, these first-time learners will quickly lose interest and are more likely to drop out (Al-Harthi, 2010).

A large part of the self-regulation process is time management, and even more so in distance learning environments. Effective time management skills are a strong predictor of self-regulation, which, as discussed previously, is a student factor that contributes to success in distance education environments, due to the fact that much of the activities in distance education courses are done independently with less supervision or infrequent interactivity with students and instructors.

Closely linked to self-regulation is being able to understand and determine when it is time to seek help. Willingness to seek help is a key success factor not only for First Generation Students but college students in general as students tend to experience higher levels of stress, and academic related concerns while in college than they may have experienced prior (Vogel & Armstrong, 2010; Benton, Robertson, Tseng, Newton, & Benton, 2003). According to Cramer's (1999) help seeking model, willingness to seek academic and/or psychological help in college is closely related to self-concealment, negative or positive experiences and any resulting psychological distress one may experience (Vogel & Armstrong, 2010). For example if a student tends to initially self-conceal and has very negatives social experiences in college, the student will experience an increase in psychological distress and will be less likely to seek help.

Self-efficacy & locus of control. Self-regulation, as discussed in the previous section, is also related to self-efficacy, which in simplistic terms is the belief that one has the skills to achieve a desired task or goal. According to Pintrich & Schunk (2002) self-regulated learners usually exhibit a high sense of self-efficacy. Self-efficacy also influences choice of activities, effort of work exerted and persistence (Bandura & Cervone, 1986). Thus, we can assume that a person with high self-efficacy would most likely be able to set goals in accordance with the desired outcome or assignment, have confidence to execute the steps needed to achieve the desired goal and work at it until the task or desired goal is completed.

Self-efficacy is closely related to locus of control, which is a continuum anchored on one end by the belief that one has the ability to effect change through one's actions (internal locus of control) and on the other end by the belief that it is the environment that controls what happens to a person. Factors such as gender and previous achievement level might have some influence on the level of locus of control (Findley & Cooper, 1983; Riipinen, 1994). According to a study on locus of control, the researchers found that the males in the study typically scored higher on locus of control than women, and that the higher the educational level, (e.g. graduate degree seeking students or junior or senior), the more likely it is that the learner had successfully developed an internal locus of control (Jegede, Fan, Chan, Yum, & Taplin, 1999).

Technological fluency. An obvious, but perhaps often overlooked factor to student success in distance education environments, is technical fluency. According to the MIT Media Lab (Papert & Resnick, 1995) technical fluency encompasses multiple aspects including:

- The ability to use the computer
- The ability to learn new ways to use the computer, software or features confidently
- The ability to create documents, images, or videos and having the ability to troubleshoot when something goes wrong

- The ability to use technology to collaborate, communicate and share ideas with peers and instructors
- The ability to use technology to assist with solving complex problems, investigating and researching, and being able to create meaningful and relevant artifacts and documents based on what was discovered.

As previously described, distance education relies heavily on technology not just for the delivery of instructional content, but also for interactivity and communication between the student and instructor and the student to other students. In many cases the interactivity occurs in a learning management system such as Blackboard Learn or Instructure Canvas. Navigating and understanding the LMS interface and tools can be a challenge that learners have to overcome. Before the student can fully access and interact with the content, peers and instructor, he/she also needs to understand and be able to technically navigate the LMS (Osika & Sharp, 2002).

Access to technology is also a limiting factor. Many distance learning courses include discussion forums and boards which not only require learners to create posts or threads related to the instructional content, they also have to respond to their peers posts as well. Though the frequency varies, if learners cannot access the content, post or reply to posts in a timely manner, they can become quickly overloaded and discouraged, and this may affect the quality of their posts (Tyler-Smith, 2006).

First Generation Students

First-generation students are increasingly enrolling in institutions of higher education and are bringing with them a new set of unique characterisitics which in many ways places them at a disadvantage before the first day of class. According to

Pascarellaet al. (2004) in their comprehseive look at first generation learners, these general unique charcateristics include a lack of basic knowledge about the overall university process including costs, application processing, and navigating the university system. FGS's often have unrealistic or unknown educational degree plans and overall expectations (Horn & Nunez, 2000; Hossler, Schmit, & Vesper, 1999; Pratt & Skaggs, 1989; Warburton et al., 2001; York-Anderson & Bowman, 1991), and FGSs who were struggling financially are less likely to be engaged in college life and even complete college (Pascarella et al., 2004).

FGS also face difficulties in transition from high school to university or higher education, including academic, cultural, social, and academic transitions (Lara, 1992; Rendon, 1992; Rendon, Hope, & Associates, 1996). FGSs strongly benefit from interactivity and engagement within the classroom. Given the deficiencies that FGS face prior to enrolling into college, they have to work harder than their counterparts just to be accepted into a university or college. Once they have been admitted, unfortunately, FGS have demonstrated a higher drop-out rate than other students. They are less likely to complete a bachelor's degree in four years, and even less likely to remained enrolled after five years (Berkner, Horn, & Clune, 2000; Choy, 2000; Horn, 1998; Nunez & Cuccaro-Alamin, 1998; Warburton et al., 2001).

These are collective characteristics of first-generation students enrolled in higher institutions of learning; however these issues can be compounded with the requirements of distance education, such as high persistence, locus of control, self-efficacy, and effective time management. In addtion, there could be technology barriers as well, not necessarily in the use of technology but considering the possible lack of financial support, technology access could be an issue (Berkner, Horn, & Clune, 2000; Choy, 2000; Horn, 1998; Nunez & Cuccaro-Alamin, 1998; Warburton et al., 2001).

First Generation Students in Distance Education

Often, first generation students are drawn to distance education environments because of flexibility and the ability to participate in self-paced learning (Illinois Online Network, 2010). However, they enroll without the skills and necessary attributes to succeed in distance education courses (Hukle, 2009; Kelly, 2009; Winogron, 2007). Moreover, Engle and Tinto (2009) found that FGS, who are likely to be financially disadvantaged, graduate at a lesser rate than their counterparts. Among those who do complete their degree, only 11% of low-income first-generation students graduated with a four year degree compared to 55% of more advantaged students after six years. This number may be worse for distance education, if FGS are less prepared than their non-FGS counterparts (Engle and Tinto, 2009)

As first generation students are enrolling in distance education courses, they bring with them a set of unique characteristics, skill sets, and needs that may not be conducive with the instruction of distance education courses. Universities that were once primarily concerned with building technical infrastructures are now faced with a new challenge of educating and retaining first-generation adult learners, who often enroll in distance education course without the required skills, and attributes to be successful in distance education courses (Hukle, 2009; Kelly, 2009; Winogron, 2007).

Conclusion

Distance education is a relatively recent alternative to the traditional face-to-face format as an option for course credit in institutions of higher learning. As with any paradigm shift in large organizations, there will be inevitable complications during the early stages of growth, and many of the struggles will be difficult to resolve. However, one of the suppositions of this study is that the distance learning concept in all of the various formats is here to stay, so it is essential to accept the challenges, persevere, and find solutions to the problems (Beatty, 2007).

Some of the research findings from studies that looked at the first generation of distant learners were discouraging, yet the early results merely reflected growing pains. Just as a newborn foal is usually wobbly until he gets his bearing, the initial renditions of the distance learning models may have been clumsy and less sophisticated than later versions. As more recent studies are published, the findings will certainly reflect an increase in student success and satisfaction with the method (Sonwalkar, 2008; Chandler, 2012).

Furthermore, as universities develop their programs, they must move beyond a focus on the general population and expand their options for distant learning models to include a diverse student body (Thayer, 2000). To accommodate the first-generation students, administrators and instructors need to become cognizant of students' specific skills and use this knowledge as a tool for designing appropriate instruction. Thus, future studies are called for to assess student readiness prior to attempting the coursework as well as the achievement results upon completion of distant learning programs (Chandler, 2012; Lokken & Mullins, 2014).

CHAPTER III:

METHODOLOGY

In this chapter, information about the research site, participants and research design are outlined. In addition, overall descriptions of the research design, procedures, measures, instrument used, and major research questions are detailed. Lastly, ethical considerations, limitations and an overall summary are described.

Site/University

The site for this research is a small, urban university located in the southwestern United States. The university was accredited by the Southern Association of Colleges and Schools on Commission in January of 2015. The university's mission is to:

> prepare and empower students through innovative and challenging academic and co-curricular programs that contribute to and enrich the economic and social development of the community and region. A solid foundation for success is established through dynamic teaching, scholarship, research, and public service that inspire graduates to lifelong learning and responsible global citizenship.

While offering over thirty-seven programs that lead to baccalaureate and master's degrees, this university only offers junior level, senior level and graduate level courses in the university's three colleges – College of Arts and Sciences, College of Business and

College of Education and Human Development. With a total enrollment of approximately 4,500 students, 202 Full-time and adjunct faculty, and 199 staff, this university offers 37 degree programs and majors.

University Student Population Demographics Participants

More than 90 percent of the university's students come from urban areas, and in 2014, approximately 75 percent of the student body was classified as undergraduate, 1.3 percent as post-baccalaureate, and 24 percent as graduate.

Table 1.
University Demographics

Demographic	%
Gender	
Male	36
Female	64
Race	
American Indian or Alaskan Native	2.39
Asian	1.44
Black or African American	6.50
International	0.93
Multiracial	3.61
Native Hawaiian or Other Pacific Islander	0.11
Unknown or Not Reported	19.8
White	65.3
Ethnicity	
Hispanic or Latino	66.9
Not Hispanic or Latino	31.5
Unreported	1.55
Age	
<21	1.44
21-25	29.7
26-30	26.0
31-35	15.3
36-40	10.7
41-45	6.83
46-50	4.82
>50	5.15
First Generation Student	56.0
Total Enrollment	4,521

Gender. Thirty-six percent of the total student body is male and approximately 64 percent is female. Among the undergraduate student body, 36 percent are male and 64 percent are female. Among graduate students, the percentages are similar with 33 percent male and 67 percent female.

Race and ethnicity. With regards to race, 65 percent of the university's student body is white. 2.4 percent is Native American or Alaskan, 1.44 percent is Asian, 6.5 percent Black or African-American, and 20 percent is unknown or unreported. Regarding ethnicity, 67 percent of the student body is Hispanic or Latino and 32 percent non-Hispanic or non-Latino.

Age. As reported in fall 2014, 29.73 percent of the student body is 21-25 years of age. Twenty-six percent of students are 26–30, 15 percent are 31–35 years of age, and 11percent are 36–40. Interestingly enough, only 1.44 percent, or 65 students, are less than 21 years of age.

First generation status. Fifty-six percent of the student body reported being FGS. First generation is defined by students who parents have never attended college and/or have never graduated college. The number of FSG is determined by self-report to the following questions: (a) Did either of your parents graduate from college? (b) Did either of your parents attend college?

Course related information. In 2014, with regards to instructional mode, 430, or 66 percent of the courses offered were face-to-face, 58, or 9 percent were exclusively online, and 160 or 25percent, were listed as hybrid.

Research Sample Demographics

Gender. With a 16% overall completion rate, sixty-two percent of the total sample was female and thirty eight percent was male (See Table 2). This was similar to the total university population, as stated previously.

Race and ethnicity. The data collection for race and ethnicity differed from the sample size and the university population. During the data collection for the sample, race and ethnicity was combined. The categories were listed as follows: American Indian or Alaskan Native, Asian or Other Pacific Islander, Black or African American, Unknown or Not Reported, White, Hispanic or Latino. Sixty-two percent of the sample were Hispanic or Latino; twenty-four percent were white/Caucasian; six percent was Black/African American; one percent reported being American Indian or Asian.

Age. Based on the results from the survey, only four percent of the participants reported an age less than 21 years of age. Thirty-one percent reported an age between 21 and 25; twenty percent reported ages between 26 and 30; sixteen percent reported ages between thirty-one and thirty-five, and the remaining thirty percent reported ages from thirty-six and more (See Table 2).

First generation status. Forty percent of the sample reported being FGS. As stated previously, First generation was defined by students who parents have never attended college and/or have never graduated college.

Table 2.
Sample Demographics

Demographic	%
Gender	
Male	38
Female	62
Race/Ethnicity	
American Indian or Alaskan Native	1.0

	Asian or Other Pacific Islander	2.0
	Black or African American	6.0
	Unknown or Not Reported	3.0
	White	24
	Hispanic or Latino	62
Age		
	<21	4.0
	21-25	31.0
	26-30	20.0
	31-35	16.0
	36-40	11.0
	41-45	8.0
	46-50	5.0
	>50	6.0
First Generation Student		40
Total		605

Research Design

This project was a non-experimental quantitative study using extant institutional data. The study was designed to better understand and explore FGS readiness to enroll in distance education courses at the university. When conducting higher educational research, non-experimental designs were used frequently (Heck, 2009). While student readiness data at this institution was collected in fall 2013, it was not examined comprehensively in regard to different distance education modes. Further, it was not analyzed in terms of FGS because this exploratory research sought to establish a baseline for further research. Lohmeier (2010) argued that non-experimental research can be used to examine group differences and, once categorized, to answer specific questions about the groups. The outcomes of this study determined whether there are any differences in FGS and non-FGS student readiness for distance education. Other than the basic analysis of pre-existing institutional data, there was an intervention or manipulations of grouping or readiness scores.

The following research questions guided this study:

R1: How do FGS and non-FGS differ in terms of student readiness?

R2: What relationship is there between student readiness and success in online and/or hybrid courses?

R3: How do FGS and non-FGS differ in terms of the relationship between student readiness and success in online and/or hybrid courses?

Table 3 presents the questions, measures and means of analysis used to answer each of them.

Table 3.
Research Questions, Measurements Factors Measured & Proposed Data Analysis Test

Research Questions	Measurement & Instruments	Items/Factors Measured	Data Analysis
R1: How do FGSs and non-FGSs differ in terms of student readiness?	Smarter Measures	· Scores on Smarter Measures subscales (Motivation, Locus of Control, Procrastination, and Willingness to Seek Help)	· Descriptive statistics · T-tests of group differences Smarter Measures subscales (Motivation, Locus of Control, Procrastination, and Willingness to Seek Help)
R2: What relationship is there between student readiness and success in online and/or hybrid courses?	Smarter Measures Course success data	· Scores on Smarter Measures scales · GPA	· Descriptive statistics · Correlations between and among readiness and success factors
R3: How do FGS and non-FGS differ in terms of the relationship between student readiness and success in online and/or hybrid courses?	· Smarter Measures · Course success data	· Scores on Smarter Measures scales · GPA	· Descriptive statistics · ANCOVA analyzing mean group differences among FGS and NFGS

Procedure

In fall of 2013, links to the SmarterMeasure™, readiness indicator were embedded in all 903 Blackboard Learn courses at the small-sized southern university. Every course regardless of delivery type (exclusively online, face-to-face or hybrid and hyflex) had a course shell in the university's LMS, Blackboard Learn. Along with a brief description of the assessment, faculty were informed of the purposes of the SmarterMeasure™ readiness survey. Students were asked to voluntarily take the assessment.

During the fall 2013 semester, approximately 670 students completed all seven sections of the SmarterMeasure™ assessment. The assessment was made available beginning August 2013 and remained open until December 2013. Students were able to take the assessment at any time during the semester. Specific details of the instrument will be listed in the next section. Students accessed the SmarterMeasure™ assessment through their individual Blackboard Learn courses. Completed surveys were made available to the student (with feedback and additional resources, the faculty at the course-level and to the administrator of the SmarterMeasure™ account at the university level). The SmarterMeasure ™ data is housed externally on the SmarterMeasure™ servers and independently stored from Blackboard Learn data. The first page of the survey was completely customized to collect the following demographic information:

- Please enter Your K-Number
- What is your classification?
- Are you currently enrolled in another school? (e.g. PAC, SAC, etc.)
- Did either of your parents graduate from college?

- Did either of your parents attend college?
- Are you currently enrolled in a Hybrid Course?
- Are you currently enrolled in a completely online course?
- Are you currently enrolled in a Hyflex delivery course?
- If you are a College of Business student, what is your degree program?

In addition to the scores on the SmarterMeasure™ assessment, additional student data was requested from the registrar's office and examined (See Appendix A):

Measures and Instruments

SmarterMeasure™ student readiness indicator (SmarterMeasure™, 2011). The primary survey instrument used in this study is the SmarterMeasure™ readiness assessment. The assessment is divided into seven areas – life factors, individual attributes, learning styles, reading rate and recall, technical competency, technical knowledge, and typing speed accuracy. Although each section is described below, only the following sections defined readiness: Life Factors (LF), Personal Attributes (PA), Technical Competency (TC) and Technical Knowledge (TK).

Individual attributes. This section of the assessment assesses student attributes that can be improved through academic interventions. This section measures six sub scales: time management, procrastination, persistence, academic attributes, locus of control and willingness to ask for help. Twenty-four items are in this section with each of the six subscales being measured by four items of four-point Likert-type scale ("not like me at all", "not much like me", "somewhat like me", or "very much like me").

Life factors. Life Factors (LF) includes 20 items/questions of four-point Likert-type scale about external elements in students' lives that may influence their ability to continue their education. The section measures five items: time, place, research resources and skills.

Learning styles. Although it may vary from context to context, this section measures learning styles, based on the multiple intelligence model. Through a series of 21 questions, students are scored in the following areas: visual, logical, solitary, verbal, social, aural and physical.

Technical competency. Technical Competency (TC) assesses the students' experience using computers and basic functions such as how to find a document, attach and email. Students were given the option to select the preferred operating system- Mac or Windows based platforms prior the start of the assessment. Ten questions were presented based on the type of system selected. The second component of this section is Internet experience (four items). Because many of the assignments require learners to use the Internet to access materials, and even participate in class, experience using the Internet is very essential.

Technical knowledge. Similar to Technical Competency, the Technical Knowledge (TK) section measures the following: technology usage, access to technology in students' lives (two items in which the learner self-reports their level at which they integrate technologies into other areas of their lives) and basic technology vocabulary (10 items – four choice multiple choice).

On-screen reading rate and recall. Depending on the course design, a lot of onscreen reading and comprehension could be required. Research has shown that reading is about 25 percent slower when reading from a computer screen than a book. Students in this section will be presented with a paragraph to read and timed from the amount of time it takes to finish reading the selection. The speed at which they read will be recorded as words per minute. Immediately afterwards, students will be asked a series of comprehension question about the topic at hand.

Typing speed and accuracy. The skill of typing can be useful in distance education courses particularly when responding to discussion board posts, chats or wikis and blogs. In this section, students will have to retype a given paragraph. Upon completion, the scores will be in words per minute, total number of errors/misspellings, total elapsed time, characters per minute and accuracy.

Validity and Reliability

Validity. Three studies were conducted to measure the degree to which SmarterMeasure™ was an indicator of learners' level of readiness for studying in an online or technology rich environment. Results from the three studies indicated that SmarterMeasure™ has strong construct validity in that it is an indicator of the goodness of fit for distance learning as is evidenced by multiple correlations that are statistically significant at the .01 level. (SmarterMeasure™, 2011).

Reliability. In 2011 Applied Measurement Associates of Alabama, conducted reliability coefficient calculations for the questions on the instrument. Expected range for Cronbach Alphas reliability coefficient values was from .70 to .95. The calculation yielded the following:

Table 4.
SmarterMeasure™ Reliability

Scale	α	Number of Items	*n*
Learning Styles	.81	21	873
Learning Styles	.81	35	28,056
Individual Attributes	.80	24	29,989
Life Factors	.76	20	30,004

Technical Knowledge	.75	23	29,992
Technical Competency	.38	10	30,001

A Cronbach Alpha Reliability Coefficient of .80 indicates that 80percent of the score can be consistently reproduced using the assessment items consistently reproduced (SmarterMeasure™, 2011).

CHAPTER IV

RESULTS AND ANALYSIS

Smarter Measures™ Survey

Totals

Although the SmarterMeasure™ assessment tool contains seven separate assessments (Life Factors, Individual Attributes, Technical Competency, Technical Knowledge, Reading Rate and Recall, Typing Speed and Accuracy, and Learning Styles), for the purposes of this study, the components that were utilized focused on Life Factors, Individual Attributes Technical Competency and Technical Knowledge.

Life factors total. Life Factors (LF_Total) were totaled by the sum of responses from questions in five subscales. The possible total Life Factors scores ranged from 0 – 100. Life Factors consists of five sub-scales: Place, Reason, Resources, Skills and Time. Each set of scores was calculated and downloaded from the SmarterMeasure™ administrative website. The total Life Factors score was calculated by adding each of the totals in the subscales. The higher the score, the less likely Life Factors will have a negative impact on students' ability to be successful in distance education courses. Table 5 represents the means and standard deviations for participant responses.

Table 5.
Life Factors Means, Standard Deviations

Total Scores	*n*	M	SD
Life Factors Total	605	72.76	10.02
Place	605	15.40	2.48
Reason	605	18.12	2.27
Resources	605	13.42	4.09
Skills	605	13.57	2.50
Time	605	12.25	3.36

Place. The Place subscale (LF_Place) was calculated from the sum of four Likert-type questions; these questions focused on having a space dedicated to studying and having limited interruptions. Each question had scores ranging from one to five, five being the most desired/conducive. The higher the number, the less likely Place (LF_Place) would have a negative impact on the students' ability to be successful in distance education courses.

Reason. Reason (LF_Reason) was calculated as the sum of four Likert-type questions which focused on the participants' reasons and motivation for taking distance education courses. Participants were asked to select one of five answer choices based on which statement was closest to how they felt. The higher the score, the more likely students were motivated to attend and complete distance education courses.

Resources. Resources (LF_Resources) were calculated from the sum of Likert-type questions which focused around the participants' perception of support when taking distance education courses, including financial, family, friends and employer support. Participants were asked to select one of five answer choices, based on which statement was closest to how they felt. The higher the score, the more likely students' felt they had the support they needed to attend and complete distance education courses.

Skills. Skills (LF_Skills) were calculated as the sum of four scale-type questions which focused on students' attitudes and beliefs about their ability to learn in a distance education environment, as well as reporting their previous experiences taking and completing courses. Participants were asked to select one of five answer choices, based on which statement was closest to how they felt. The higher the score, the more likely participants felt that they had the skills to complete and succeed in distance education courses.

Time. Similar to the other subscales, Time (LF_Time) totals were calculated as the sum of four questions, which assessed the current amount of time students have available to commit to their academic pursuits. Participants were asked to select the number of hours per week that they were involved in non-work responsibilities, work related (part-time/full-time) and how many hours they felt they could commit to school. The more hours they could commit to school and the least amount of competing hours had an overall impact on the total subscale score. The higher the total time score, the higher the likelihood that the participants will have time to devote to distance education courses and to increase their likelihood of success.

Personal attributes total. Personal Attributes (TL_Personal Attributes) were totaled by the sum of responses from questions in six areas: Academic Attributes, Willingness to Seek Help, Persistence, Procrastination, Time Management, and Locus of Control. The possible total Personal Attributes (PA_Total) score could range from 0 to 100. The scores from each of the six subscales were calculated and downloaded from the SmarterMeasure™ administrative website. The total Personal Attributes (PA_Total) score was calculated by adding each of the totals in the subscales. The higher the score, the less likely Personal Attributes will have a negative impact on the students' ability to be successful in distance education courses. Table 6 represents the means and standard deviations for participant responses.

Table 6.
Personal Attributes Means, Standard Deviations

Total Scores	*n*	M	SD
Personal Attributes Total	605	73.25	7.55
Academic Attributes	605	13.49	2.03
Help Seeking	605	11.70	1.62
Locus of Control	605	11.20	2.00
Persistence	605	12.07	1.77
Procrastination	605	11.22	2.43
Time Management	605	13.56	2.02

Academic Attributes. Academic Attributes (PA_Academic Attributes) was calculated by the sum of four Likert-type questions which focused on the participants' reflection of academic success and their self-perception of their ability to perform well in academic endeavors. Participants were asked to select one of four answer choices (1= Not like me at all to 4 = very much like me). The higher the score, the more likely the students' felt they would be successful and able to complete distance education courses.

Willingness to seek help. Willingness to Seek Help (PA_Willingness to Seek Help) was calculated as the sum of four Likert-type questions, which measured the participants' willingness to seek help when faced with an academic problem. Participants were asked to select one of four answer choices (1= Not like me at all to 4 = very much like me). The higher the score, the more likely the students' would be willing to seek help when they encounter issues in distance education courses.

Locus of control. Similar to seeking help, Locus of Control (PA_Locus of Control) was calculated by the sum of four Likert-type questions which measured the participants' self-perception of internal locus of control. Participants were asked to select one of four answer choices (1= Not like me at all to 4 = very much like me). The higher the score, the more likely the participants may feel they have control over their success in distance education courses.

Persistence. Student Persistence (PA_Persistence) was calculated by the sum of four Likert-type questions which measured the participants' self-perception of persistence or stick-to-it-ness. Participants were asked to select one of four answer choices (1= Not like me at all to 4 = very much like me). The higher the score, the more likely participants have the ability to finish what they started.

Procrastination. Procrastination (PA_Procrastination) is putting off tasks in favor of more pleasurable tasks. Procrastination totals were calculated by the sum of four Likert-type questions, which measured the participants' tendency to procrastinate. Participants were asked to select one of four answer choices (1= Not like me at all to 4 = very much like me). The higher the score, the less likely they would be to procrastinate.

Time management. Time Management (PA_TimeManagement) total was calculated as the sum of four Likert-type questions which measured the participants' ability to manage their time effectively. Participants were asked to select one of four (1= Not like me at all to 4 = very much like me). The higher the score, the more likely students effectively manage their time.

Technical competency total. Technical Competency (TC_Competency) were totaled by the sum of responses from questions in two areas – Computer Competency and Internet Competency. The lowest possible score was zero and the maximum possible score was 100. The technical competency score was calculated by added each of the totals in the subscales. The higher the score, the more likely the participants will be able to effectively use technology in their distance education courses. Table 7 represents the means and standard deviations for participant responses.

Table 7.
Technical Competency Means, Standard Deviations

Total Scores	*n*	M	SD
Technical Competency Total	605	91.5	10.1
Computer Competency	605	45.8	6.53
Internet Competency	605	45.7	6.56

Computer competency. Computer Competency (TC_ComputerCompetency), as previously defined, refers to the ability to perform basic technical tasks, such as saving and printing documents. Participants were given scenarios where they were asked to print, open, and save a document; they were asked to select the appropriate action or button to complete a basic computer task. The maximum Computer Competency total score totaled 50 points. The higher the Computer Competency score, the less likely participants would have difficulty performing basic computer related tasks in distance education courses.

Internet competency. Internet Competency (TC_InternetCompetency) includes the ability to communicate electronically through emails and discussion boards. Participants were given scenarios where they were asked to perform various tasks such as respond to a discussion board posts, download mp3 files, and perform internet searches. The maximum possible score for the Internet Competency subscale was 50 points. The higher the Internet Competency score, the less likely participants would have difficulty performing basic internet related tasks in distance education courses.

Technical knowledge total. Technical Knowledge (TK_Total) were totaled by the sum of responses from questions in four areas: Personal Computer & Internet Ownership/Access, Amount of Technology in Their Life, Technology Usage, and Technical Vocabulary. Technical Knowledge (TK_Total) scores could range from 0 – 100. The scores from each of the four areas were calculated and downloaded from the SmarterMeasure™ administrative website. The higher the score, the less likely Technical Knowledge would have a negative impact on the participants' ability to be successful in distance education courses. Table 8 represents the means and standard deviations for participant responses.

Table 8.
Technical Knowledge Means, Standard Deviations

Total Scores	*n*	M	SD
Technical Knowledge Total	605	47.61	7.27
Personal Computer Internet Specification	605	12.05	1.29
Technology in Your Life	605	13.82	3.79
Technology Usage	605	13.75	3.78
Technology Vocabulary	605	7.98	1.61

Technology usage. Technology Usage (TK_TechnologyUsage) was calculated by the sum of responses from questions covering topics such as pdfs, email, word processing and file management. Participants were instructed to answer a series of seven Likert-type questions about technology usage in their lives. Participants were asked to select 1 of 5 answer choices based on which statement was closest to how they felt or their amount of technology usage. The higher the score, the more the participants' technology usage.

Technology in your life. Technology in Your Life (TK_TechnologyInYourLife) score was calculated by the sum of responses from questions covering the frequency of technical based activities, such as online banking, playing online games, and reading online magazines. The questions also assessed the frequency of technical device ownership including products such as smartphones, digital cameras, and DVD players. The more technical devices owned, the higher the score.

Technology vocabulary. Technology Vocabulary (TK_TechnologyVocabulary) was totaled by the sum of responses from ten multiple-choice questions. The participants had to define basic technical vocabulary such as emoticons, URL, Browser, Blogs and asynchronous communication. Participants had to select the correct answer from a series of 5 choices.

Personal computer & internet specification. The Personal Computer and Internet Specification subscale (TK_PersonalComputerAndInternetSpecification) scores were totaled by the sum of responses from four questions where the participants had to answer a series of questions covering topics around the type of computer and internet connection they would be using while completing distance education courses. The more up to date their computer and operating system, and the faster their internet connection the higher their score.

Survey Results

Study Sample Demographics Summary

First generation status. As previously defined, FGS are students whose parents never attended or graduated from college. For the study, of the 605 participants who completed the assessment, 365 of the participants were non-first generational students and 240 of the participants were FGS (see Table 9).

Table 9.
First Generation Student Status

First Generation Status	*n*	%
NFGS	365	60.0
FGS	240	40.0
Total:	605	100

Ethnicity/race. As part of the assessment, participants were asked to declare their race/ethnicity. The choices included: African-American, American Indian, Asian/Pacific Islander, Caucasian/White, Latino/Hispanic. For participants whose race/ethnicity was not represented or chose to not respond, there were categories of “other race” and “prefer not to respond”.

The total reported ethnicity/race of the participants in the study is as follows: Sixty-one percent of the participants were Latino/Hispanic, twenty-four reported being Caucasian/White, six percent African American, two percent, Asian/Pacific Islander, and six percent who chose not to answer or declared another race not listed (see Table 10).

Table 10.
Ethnicity by FGS/ NFGS Status

Ethnicity	FGS		NFGS		Total	
	n	%	*n*	%	*n*	%
Latino / Hispanic	169	45.6	202	54.4	371	61.3
African-American	9	25.0	27	75.0	36	6.00
Caucasian/White	42	28.6	105	71.4	147	24.3
Asian or Pacific Islander	4	36.4	7	63.6	11	1.80
Other race	3	15.0	17	85.0	20	3.30
Prefer not to respond	9	56.2	7	43.8	16	2.60
American Indian	44	100	0	0	4	0.70
Total	240	39.7	365	60.3	605	100

Age and gender. As part of the assessment, participants were asked declare their age. The mean age for FGS was 34.75 (M=34.75, SD= 11.07) and NFGS was 29.53 (M=29.53, SD=7.97).

Table 11.
Gender by FGS/ NFGS Status

Gender	FGS		NFGS		Total	
	n	%	*n*	%	*n*	%
Male	86	35.4	157	64.6	243	60
Female	154	42.5	208	57.5	362	40

In the first section of the SmarterMeasure™ assessment instrument, participants were also asked to declare their gender. Based on the results, 60% (*n*=362) of the participants were female and 40% (*n*=243) were male (See Table 11).

Question 1: Do FGS and non-FGS differ in terms of student readiness?

The first question explored any differences in scores between FGS and NFGS. Data were screened for outliers and assumptions for normality and all assumptions were met. To analyze this question and the null hypothesis, a t-test was run between FGS and Non-FGS for the overall scale and the sub scales. Mean, SD significance, and effect sizes are presented in table 12.

Table 12.
Life Factors Means, Standard Deviations, and Significance for FGS and NFGS

	FGS			NFGS			*p*	*d*
	n	M	SD	*n*	M	SD		
Total Score	240	73.05	10.03	365	72.56	10.02	.552	0.05
Place	240	15.44	2.479	365	15.37	2.482	.728	0.03
Reason	240	18.22	2.219	365	18.06	2.306	.416	0.07
Resources	240	13.18	4.148	365	13.57	4.047	.247	-0.10
Skills	240	13.94	2.342	365	13.32	2.563	.003*	0.25
Time	240	12.28	3.346	365	12.24	3.370	.888	0.01

Null Hypothesis 1: *There is no evidence to support a difference in the life factors, (dedicated place to study, reasons for attending school, supporting resources, skills and efficient time to take online classes) between FGS and Non-FSGs.*

Overall a significant difference was not found in the overall scale of Life Factors, $t(603) = .60$, $p>.050$, $d=.049$. Closer examination of the subscales, however revealed significant difference in the subscale Skills. As previously mentioned, the subscale for skill measures students' attitudes and beliefs about their ability to learn in a distance education environment as well as their previous experience taking and completing courses. An independent-samples t-test indicated that skill scores were significantly higher for FGS (*M*=13.94, *SD*=2.342) than NFGS (*M*=13.32, *SD*=2.56); $t(603) = 3.03$, $p < .050$, $d= .253$.

This result is surprising because much of the literature suggest that FGS students have lower skills than NFGS. Closer examination of the sample revealed that FGS are older than average (*M*= 34; see table 13).

Table 13.
Age vs. FGS Status

Status	*n*	M	SD
NFGS	365	29.53	7.96
FGS	240	34.75	11.07
Total	605	31.60	9.65

The literature also suggests that older students typically have higher skill sets due to additional success in professional experiences. This could explain the differences. To test this, an ANCOVA was run controlling for age. Results were still significant. Implications will be discussed in Chapter 5. The null hypothesis was retained.

The amount of a student's locus of control has been found to be a predictor of success in academic environments (Gifford, Briceno-Perriott & Mianzo, 2006). A t-test was run to compare locus of control scores between males and females. The results revealed that females had a higher mean score than males (*M*=11.30; *SD* = 1.848).

Null Hypothesis 2:*There is no evidence to support a difference in the personal attributes, (self-perception of likelihood of academic success, willingness to seek help, locus of control, persistence and procrastination) between FGS and Non-FSGs.*

Overall, a t-test indicated a significant difference in the overall scale of Personal Attributes between FGS *(M*=74.24 *SD*=.476*)* and NFGS *(M*=72.60 *SD*=.398*)*, t(603) = 2.63, p< .050, d=3.74 (see Table 14 Personal Attributes.)

Table 14.
Personal Attributes

	FGS			NFSG			*p*	*d*
	n	M	SD	*n*	M	SD		
Personal Attributes Total Points	240	74.24	.476	365	72.60	.398	.009*	3.74
Academic Attributes	240	13.48	.135	365	13.49	.104	.967	-0.08
Willingness to Seek Help	240	11.75	.108	365	11.67	.083	.559	0.83
Locus of Control	240	11.35	.124	365	11.10	.103	.130	2.19
Persistence	240	12.44	.115	365	11.83	.090	.000*	5.91
Procrastination	240	11.53	.153	365	11.02	.128	.011*	3.62
Time Management	240	13.68	.124	365	13.48	.108	.230	1.72

Closer examination of the subscales, revealed significant statistical difference in the subscales Persistence and Procrastination. As previously mentioned, the subscale for persistence measures the "stick to it-ness" when beginning a new task or in the case a distance education course. Procrastination measures the likelihood of putting off important tasks in favor or less important tasks. Though small, mean persistence scores for FGS *(M*=12.44, *SD*=.115*)* were slightly higher than mean scores for NFGS *(M*=11.83, *SD*=.090*)*. Mean procrastination scores for FGS *(M*=11.*53, SD*=.153*)* were slightly higher than mean scores for NFGS *(M*=11.02, *SD*=.128*)*.

Overall a significant difference was found in the overall scale of Personal Attributes and 2 of the 6 subscales. The null hypothesis was rejected.

Null Hypothesis 3: *There is no evidence to support a difference in the technical competency, (experience using a computers & experience using the internet) between FGS and Non-FSGs.*

Overall, through the indication of a t-test, a significant difference was not found in the overall scale of technical competency between FGS *(M*=91.42, *SD*=9.88*)* and NFGS *(M*=91.53, *SD*=10.32*)*, t(603) = .139, p.050, d= -.011 (see Table 15 Technical Competency.)

Table 15.
Technical Competency

	FGS			NFSG			*p*	*d*
	n	M	SD	*n*	M	SD		
Technical Competency Total	240	91.42	9.88	365	91.53	10.31	.899	-0.01
Computer Competency	240	45.58	6.38	365	45.86	6.61	.610	-0.04
Internet Competency	240	45.83	6.79	365	45.67	6.61	.777	0.02

Since technology is such an integral part of society, including professional work experiences, FGS and NFGS alike would be comfortable with using technology and have developed a basic set of technical competencies. Since there was no significant difference, the null hypothesis was retained.

Null Hypothesis 4:*There is no evidence to support a difference in the technical knowledge, (experience using a computers & experience using the internet) between FGS and Non-FSGs.*

Through the results of a t-test, a significant difference was not found in the overall scale of Technical Knowledge between FGS *(M*=46.95,*SD*=7.23*)* and NFGS *(M*=48.05, *SD*=7.27*)*, t(603) = 1.826, p< .050, d= .152 (see Table 16 Technical Knowledge.)

Table 16.
Technical Knowledge

	FGS			NFSG			*p*	*d*
	n	M	SD	*n*	M	SD		
Technical Knowledge Total	240	46.95	7.229	365	48.05	7.273	.068	-0.152
Personal Computer & Internet Ownership/Access	240	11.96	1.372	365	12.12	1.222	.135	-0.123
Amount of Technology in life	240	13.59	3.881	365	13.98	3.718	.220	-0.103
Technology Usage	240	13.40	3.407	365	13.98	3.345	.041*	-0.172
Technical vocabulary	240	7.99	1.514	365	7.97	1.664	.886	0.013

Closer examination of the subscales revealed significant difference in the subscale Technology Usage (TK_Technology Usage). FGS (M=13.40, SD=3.41) scored lower in technology usage than NFGS (M=13.98, SD=3.35).

In general, a significant difference was not found in the overall Technical Knowledge and four of the subscales. The null hypothesis was retained.

Research Question 2: What relationship is there between student readiness and grade point average (GPA) in exclusively online, hybrid, and hyflex courses?

Life Factors and Grade Point Average

To test for any correlation between Life Factors (LF) and grade point average (GPA), a Bivariate Correlations test (Pearson's) test was run with a 1-tailed significance. Prior validity testing supported an increase in scores correlated with an increase in GPA (see table 17). All corresponding subscales were also included in the test. The results are presented in Table 17.

Table 17.
Life Factors and GPA

Scale & Subscales	Overall GPA		Hybrid Courses GPA		Online Courses GPA		Hyflex GPA	
	r	*p*	*r*	*p*	*r*	*p*	*r*	*p*
Life Factors Total	.157	.000*	.179	.000*	.186	.002*	-.145	.096
Place	.066	.054	.095	.016*	.123	.027*	-.276	.006
Reason	.075	.033*	.107	.009*	.160	.006*	.051	.325
Resources	.055	.088	.098	.015*	.062	.166	-.171	.062
Skills	.344	.000*	.314	.000*	.226	.000*	.079	.239
Time	.086	.017*	.049	.140	.145	.012*	-.073	.259

Overall GPA. It is demonstrated that GPA is positively correlated to overall Life Factors, Pearson's r(605) = .157, p< .001. This suggests that Life Factors are related to overall student success. To further examine the relationship between overall GPA and overall Life Factors, a linear regression was calculated to predict overall GPA based on the overall Life Factor score. A significant regression equation was found (F(1,603) = 14.31, p< .001), with an R^2 of .023, which indicates that overall Life Factors accounts for approximately 2% of the variance in overall GPA. When overall GPA was predicted, it was found that LF_Totals (β = .152, p <.001), meaning that for every point increase in Life Factor total scores, there was a corresponding increase in overall GPA of approximately 0.152.

Further examination of the Life Factors subscales revealed that LF_Skills (Pearson's r(488) = .344, p< .001) and LF_Time (Pearson's r(488) = .086, p < .050) were positively correlated with overall GPA.

To further examine the relationship between overall GPA and LF_Skills, a linear regression was calculated to predict overall GPA based on LF_Skills. A significant regression equation was found (F(1,603) = 73.45, p< .001), with an R^2 of .109, which indicates that LF_Skills accounts for approximately 11% of the variance in overall GPA.

When overall GPA was predicted, it was found that LF_Skills (β = 0.12, p <.001), meaning that for every point increase in life skills, there was a corresponding increase in overall GPA of approximately 0.12.

In addition, to further examine the relationship between overall GPA and LF_Times a linear regression was calculated to predict overall GPA based on LF_Time. A significant regression equation was not found (F(1,603) = 3.67, p>.050), with an R^2 of .006, which indicates that LF_Time accounts for approximately .6% of the variance in overall GPA. When overall GPA was predicted it was found that LF_Time (β = 0.02, p >.001), meaning that for every increase in LF_Time, there was a corresponding increase in overall GPA of approximately 0.02.

Hybrid courses GPA. Similarly, Hybrid Courses GPA is positively correlated to overall Life Factors, Pearson's r(488) = .179, p< .001. This suggests that LF are related to student success in hybrid courses. A linear regression was calculated to predict Hybrid GPA based on the total Life Factor. A significant regression equation was found (F(1,486) = 13.57, p < .001), with an R^2 of .027, which indicates that Life Factors total accounts for approximately 2.7% of the variance in Hybrid GPA. When Hybrid GPA was predicted, it was found that LF_Total (β = 0.015, p <.001), meaning that for every point increase in total Life Factors, there was a corresponding increase in hybrid GPA of approximately 0.015.

Closer examination of life factors reveals, that, of the LF subscales, all but Time (LF_Time) were correlated with Hybrid Courses GPA suggesting that Place (LF_Place), Pearson's r(488) = .095, p< .001, is an important factor for student success in hybrid courses.

A linear regression was calculated to predict Hybrid GPA based on the subscale LF_Place. A significant regression equation was found ($F(1, 486) = 3.95$, $p < .050$), with an R^2 of .008, which indicates that LF_Place accounts for approximately .8% of the variance in Hybrid GPA. When Hybrid GPA was predicted, it was found that LF_Place ($\beta = 0.034$, $p <.050$), meaning that for every point increase in LF_Place, there was a corresponding increase in hybrid GPA of approximately 0.034.

Reason (LF_Reason), Pearson's $r(488) = .107$, $p< .001$, was found to be positively correlated to Hybrid GPA. A linear regression was calculated to predict Hybrid GPA based on the subscale LF_Reason. A significant regression equation was found ($F(1, 486) = 2.16$, $p > .050$), with an R^2 of .004, which indicates that LF_Reason accounts for approximately 0.4% of the variance in Hybrid GPA. When Hybrid GPA was predicted, it was found that LF_Reason ($\beta = 0.027$, $p >.001$), meaning that for every point increase in LF_Reason, there was a corresponding increase in hybrid GPA of approximately 0.027.

Resources (LF_Resources), Pearson's $r(488) = .098$, $p< .050$, was found to be positively correlated to Hybrid GPA. A linear regression was calculated to predict Hybrid GPA based on the subscale LF_Resources. A significant regression equation was found ($F(1, 486) = 2.89$, $p > .050$), with an R^2 of .006, which indicates that LF_Resources accounts for approximately 0.6% of the variance in Hybrid GPA. When Hybrid GPA was predicted, it was found that LF_Resources ($\beta = 0.017$, $p >.050$), meaning that for every point increase in LF_Resources, there was a corresponding increase in hybrid GPA of approximately 0.017.

Skills, Pearson's r(488) = .314, p< .001, was also found to be positively correlated to Hybrid GPA. A linear regression was calculated to predict Hybrid GPA based on the subscale LF_Skills. A significant regression equation was found (F(1, 486) = 49.05, p < .001), with an R^2 of .092, which indicates that LF_Skills accounts for approximately 0.9% of the variance in Hybrid GPA. When Hybrid GPA was predicted, it was found that LF_Skills (β = 0.114, p<.001), meaning that for every point increase in LF_Skills, there was a corresponding increase in hybrid GPA of approximately 0.114.

Completely online courses GPA. Completely Online Course GPA is positively correlated to overall Life Factors, Pearson's r(246) = .186, p>.001. This suggests that LF are related to student success in complete online courses. A linear regression was calculated to predict completely online course GPA based on the total Life Factor score. A significant regression equation was found (F(1,244) = 12.51, p<.001), with an R^2 of .049, which indicates that Life Factors total accounts for approximately 4.9% of the variance in completely online course GPA. When completely online course GPA was predicted, it was found that LF_Total (β = 0.024, p<.001), meaning that for every point increase in total Life Factors, there was a corresponding increase in completely online course GPA of approximately 0.024.

Closer examination of Life Factors reveals, that, of the LF subscales, all but Resources (LF_Resources) were correlated with completely online course GPA. This suggests that the subscales Place (LF_Place), Pearson's r(488) = .095, p< .001, is an important factor for student success in completely online courses. A linear regression was calculated to predict completely online course GPA based on the subscale LF_Place. A significant regression equation was found (F(1, 244) = 7.61, p < .050), with an R^2 of .030, which indicates that LF_Place accounts for approximately 3% of the variance in completely online course GPA. When completely online course GPA was predicted, it was found that LF_Place ($\beta = .077$, $p <.050$), meaning that for every point increase in LF_Place, there was a corresponding increase in completely online course GPA of approximately 0.077.

LF_Reason (LF_Reason), Pearson's $r(488) = .160$, $p< .050$, was found to be positively correlated to completely online course GPA. A linear regression was calculated to predict completely online course GPA based on the subscale LF_Reason. A significant regression equation was found ($F(1, 244) = 7.85$, $p >.050$), with an R^2 of .031, which indicates that LF_Reason accounts for approximately 3% of the variance in completely online course GPA. When completely online course GPA was predicted, it was found that LF_Reason ($\beta = .097$, $p >.050$), meaning that for every point increase in LF_Reason, there was a corresponding increase in completely online course GPA of approximately 0.097.

LF_Skills, Pearson's $r(488) = .226$, $p< .001$, was also found to be positively correlated to completely online course GPA. A linear regression was calculated to predict completely online course GPA based on the subscale LF_Skills. A significant regression equation was found ($F(1, 244) = 18.55$, $p < .001$), with an R^2 of .071, which indicates that LF_Skills accounts for approximately 7% of the variance in completely online course GPA. When completely online course GPA was predicted, it was found that LF_Skills ($\beta = 0.116$, $p<.001$), meaning that for every point increase in LF_Skills, there was a corresponding increase in completely online course GPA of approximately 0.116.

LF_Time, Pearson's r(488) = .145, p< .050, was also found to be positively correlated to completely online course GPA. A linear regression was calculated to predict completely online course GPA based on the subscale LF_Time. A significant regression equation was found (F(1, 244) = 8.65, p < .050), with an R^2 of .034, which indicates that LF_Time accounts for approximately 3.4% of the variance in completely online course GPA. When completely online course GPA was predicted, it was found that LF_Time (β= 0.061, p<.050), meaning that for every point increase in LF_Time, there was a corresponding increase in completely online course GPA of approximately 0.061.

Hyflex courses GPA. Unlike the other course delivery methods, Hyflex course GPA is not positively correlated to overall Life Factors, Pearson's r(82) = -.145, p> .001.

Personal Attributes and Grade Point Average

To test for any correlation between Personal Attributes (PA) and grade point average (GPA), a Bivariate Correlations test (Pearson's) was conducted with a 1-tailed significance. All corresponding subscales were also included in the test. The results are below (see Table 18).

Table 18.
Personal Attributes and GPA

Scale & Subscales	Overall GPA		Hybrid Courses GPA		Online Courses GPA		Hyflex GPA	
	r	p	r	p	r	p	r	p
Personal Attributes Total	.171	.000*	.224	.000*	.150	.009*	.042	.354
Academic Attributes	.095	.010*	.121	.004*	.071	.133	-.132	.119
Help Seeking	.134	.000*	.125	.003*	.023	.360	-.025	.413
Locus of Control	.087	.016*	.091	.022*	.131	.020*	.158	.078
Persistence	.076	.031*	.074	.052	.102	.055	.030	.395
Procrastination	.150	.000*	.212	.000*	.101	.056	.120	.141
Time Management	.094	.010*	.160	.000*	.084	.096	-.069	.269

Overall GPA. Overall GPA is positively correlated to overall Personal Attributes (PA), Pearson's r(605) = .171, p< .001. This suggests that Personal Attributes are related to overall student success. A linear regression was calculated to predict overall GPA based on the total Personal Attributes score. A significant regression equation was found ($F(1,603) = 17.65$, $p < .001$), with an R^2 of .028, which indicates that Personal Attribute total accounts for approximately 2.8% of the variance in overall GPA. When completely overall GPA was predicted, it was found that Personal Attribute total (β=0.020, p <.001), meaning that for every point increase in total Personal Attributes, there was a corresponding increase in overall GPA of approximately 0.020. Closer examination of Personal Attributes reveals that all of the subscales were positively correlated with overall GPA.

The subscale Academic Attributes, Pearson's r(605) = .095, p< .05, was found to be correlated to overall GPA. A linear regression was calculated to predict overall GPA based on the subscale PA_Academic Attributes. A significant regression equation was found ($F(1, 603) = 6.63$, $p > .050$), with an R^2 of .011, which indicates that PA_Academic Attributes accounts for approximately 1.1% of the variance in overall GPA. When overall GPA was predicted, it was found that PA_Academic Attributes (β=0.047, p <.050), meaning that for every point increase in PA_Academic Attributes, there was a corresponding increase in overall GPA of approximately 0.047.

The subscale PA_Help Seeking, Pearson's r(605) = .134, p< .001, was found to be correlated to overall GPA. A linear regression was calculated to predict overall GPA based on the subscale PA_Help Seeking. A significant regression equation was found ($F(1, 603) = 9.04$, $p < .050$), with an R^2 of .015, which indicates that PA_Help Seeking accounts for approximately 1.5% of the variance in overall GPA. When overall GPA was predicted, it was found that PA_Help Seeking (β=0.068, $p < .050$), meaning that for every point increase in PA_Help Seeking, there was a corresponding increase in overall GPA of approximately 0.068.

The subscale PA_Locus of Control, Pearson's $r(605) = .087$, $p < .050$, was found to be correlated to overall GPA. A linear regression was calculated to predict overall GPA based on the subscale PA_Locus of Control. A significant regression equation was found ($F(1, 603) = 5.43$, $p < .050$), with an R^2 of .009, which indicates that PA_Locus of Control accounts for approximately .9% of the variance in overall GPA. When overall GPA was predicted, it was found that PA_Locus of Control (β=0.043, $p < .050$), meaning that for every point increase in PA_Locus of Control, there was a corresponding increase in overall GPA of approximately 0.043.

The subscale PA_Persistence, Pearson's $r(605) = .076$, $p < .050$, was found to be correlated to overall GPA. A linear regression was calculated to predict overall GPA based on the subscale PA_Persistence. A significant regression equation was found ($F(1, 603) = 5.71$, $p < .050$), with an R^2 of .009, which indicates that PA_Persistence accounts for approximately .9% of the variance in overall GPA. When overall GPA was predicted, it was found that PA_Persistence (β=0.050, $p < .050$), meaning that for every point increase in PA_Persistence, there was a corresponding increase in overall GPA of approximately 0.050.

The subscale PA_Procrastination, Pearson's $r(605) = .150$, $p < .050$, was found to be correlated to overall GPA. A linear regression was calculated to predict overall GPA based on the subscale PA_Procrastination. A significant regression equation was found

($F(1, 603) = 10.29$, $p < .050$), with an R^2 of .017, which indicates that PA_Procrastination accounts for approximately 1.7% of the variance in overall GPA. When overall GPA was predicted, it was found that PA_Procrastination ($\beta = 0.048$, $p <.050$), meaning that for every point increase in PA_Procrastination, there was a corresponding increase in overall GPA of approximately 0.048.

The subscale PA_Time Management, Pearson's $r(605) = .094$, $p< .050$, was found to be correlated to overall GPA. A linear regression was calculated to predict overall GPA based on the subscale PA_Time Management. A significant regression equation was found ($F(1, 603) = 5.74$, $p < .050$), with an R^2 of .009, which indicates that PA_Time Management accounts for approximately .9% of the variance in overall GPA. When overall GPA was predicted, it was found that PA_Time Management ($\beta = 0.044$, $p <.050$), meaning that for every point increase in PA_Time Management, there was a corresponding increase in overall GPA of approximately 0.044.

Hybrid courses GPA. Similarly, Hybrid Course GPA is positively correlated to overall Personal Attributes, Pearson's $r(488) = .212$, $p< .001$. This suggests that PA are related to student success in hybrid courses. A linear regression was calculated to predict hybrid course GPA based on the total Personal Attributes score. A significant regression equation was found ($F(1,486) = 24.04$, $p < .001$), with an R^2 of .047, which indicates that Personal Attribute total accounts for approximately 4.7% of the variance in hybrid course GPA. When hybrid course GPA was predicted, it was found that Personal Attribute total ($\beta = 0.027$, $p <.001$), meaning that for every point increase in total Personal Attributes, there was a corresponding increase in hybrid course GPA of approximately 0.027. Closer examination of Personal Attributes reveals that all but 1 of the subscales were positively correlated with hybrid course GPA.

The subscale Academic Attributes, Pearson's $r(488) = .121$, $p < .05$, was found to be correlated to hybrid course GPA. A linear regression was calculated to predict hybrid course GPA based on the subscale PA_Academic Attributes. A significant regression equation was found ($F(1, 486) = 7.44$, $p > .050$), with an R^2 of .015, which indicates that PA_Academic Attributes accounts for approximately 1.5% of the variance in hybrid course GPA. When hybrid course GPA was predicted, it was found that PA Academic Attributes ($\beta = 0.056$, $p < .050$), meaning that for every point increase in PA_Academic Attributes, there was a corresponding increase in hybrid course GPA of approximately 0.056.

The subscale PA_Help Seeking, Pearson's $r(488) = .125$, $p < .050$, was found to be correlated to hybrid course GPA. A linear regression was calculated to predict hybrid course GPA based on the subscale PA_Help Seeking. A significant regression equation was found ($F(1, 486) = 9.12$, $p < .050$), with an R^2 of .018, which indicates that PA_Help Seeking accounts for approximately 1.8% of the variance in hybrid course GPA. When hybrid course GPA was predicted, it was found that PA_Help Seeking ($\beta = 0.077$, $p < .050$), meaning that for every point increase in PA_Help Seeking, there was a corresponding increase in hybrid course GPA of approximately 0.077.

The subscale PA_Locus of Control, Pearson's $r(488) = .091$, $p < .050$, was found to be correlated to hybrid course GPA. A linear regression was calculated to predict hybrid course GPA based on the subscale PA_Locus of Control. A significant regression equation was found ($F(1, 486) = 2.53$, $p > .050$), with an R^2 of .005, which indicates that

PA_Locus of Control accounts for approximately .5% of the variance in hybrid course GPA. When hybrid course GPA was predicted, it was found that PA_Locus of Control ($\beta = 0.034$, $p > .050$), meaning that for every point increase in PA_Locus of Control, there was a corresponding increase in hybrid course GPA of approximately 0.034

The subscale PA_Procrastination, Pearson's $r(488) = .212$, $p < .050$, was found to be correlated to hybrid course GPA. A linear regression was calculated to predict hybrid course GPA based on the subscale PA_Procrastination. A significant regression equation was found ($F(1, 486) = 20.55$, $p < .050$), with an R^2 of .041, which indicates that PA_Procrastination accounts for approximately 4.1% of the variance in hybrid course GPA. When hybrid course GPA was predicted, it was found that PA_Procrastination ($\beta = 0.077$, $p < .050$), meaning that for every point increase in PA_Procrastination, there was a corresponding increase in hybrid course GPA of approximately 0.077.

The subscale PA_Time Management, Pearson's $r(488) = .160$, $p < .05$, was found to be correlated to hybrid course GPA. A linear regression was calculated to predict hybrid course GPA based on the subscale PA_Time Management. A significant regression equation was found ($F(1, 486) = 10.10$, $p < .050$), with an R^2 of .024, which indicates that PA_Time Management accounts for approximately 2.4% of the variance in hybrid course GPA. When hybrid course GPA was predicted, it was found that PA_Time Management ($\beta = 0.070$, $p < .050$), meaning that for every point increase in PA_Time Management, there was a corresponding increase in hybrid course GPA of approximately 0.070.

Completely online courses GPA. Completely Online Course GPA is positively correlated to overall Personal Attributes, Pearson's r(246) = .150, p< .050. This suggests that PAs are related to student success in completely online courses. A linear regression was calculated to predict completely online course GPA based on the total Personal Attributes score. A significant regression equation was found (F(1, 244) = 8.48, p < .050), with an R^2 of .034, which indicates that Personal Attribute total accounts for approximately 3.4% of the variance in completely online course GPA. When completely online course GPA was predicted, it was found that Personal Attribute total (β = 0.026, p <.050), meaning that for every point increase in total Personal Attributes, there was a corresponding increase in completely online course GPA of approximately 0.026.

Closer examination of Personal Attributes reveals that only one of the subscales were positively correlated with completely online course GPA. The subscale PA_Locus of Control, Pearson's r(246) = .131, p< .050, was found to be correlated to completely online course GPA. A linear regression was calculated to predict completely online course GPA based on the subscale PA_Locus of Control. A significant regression equation was found (F(1, 444) = 5.00, p<.050), with an R^2 of .020, which indicates that PA_Locus of Control accounts for approximately 2.0% of the variance in completely online course GPA. When completely online course GPA was predicted, it was found that PA_Locus of Control (β = 0.079, p<.050), meaning that for every point increase in PA_Locus of Control, there was a corresponding increase in completely online course GPA of approximately 0.079.

Hyflex courses GPA. Unlike the other course delivery methods, Hyflex course GPA is not positively correlated to overall personal attributes or any of the subscales, Pearson's r(82) = .042, p>.050.

Technical Competency and Grade Point Average

To test for any correlation between Technical Competency (TC) and grade point average (GPA), a Bivariate Correlations test (Pearson's) test was run with a 1-tailed significance. All corresponding subscales were also included in the test. The results are below (see Table 19).

Table 19.
Technical Competency and GPA

Scale & Subscales	Overall GPA		Hybrid Courses GPA		Online Courses GPA		Hyflex GPA	
	r	p	r	p	r	p	r	p
Technical Competency Total	.169	.000*	.140	.001*	.151	.009*	-.093	.202
Computer Competency	.149	.000*	.066	.073	.121	.029*	-.075	.252
Internet Competency	.118	.002*	.173	.000*	.076	.116	-.051	.326

Overall GPA. As you can see, overall GPA is positively correlated to overall Technical Competency (TC), Pearson's r(605) = .169, p< .001. This suggests that Technical Competencies are related to overall student success. A linear regression was calculated to predict overall course GPA based on the total Technical Competency score. A significant regression equation was found (F(1,603) = 19.23, p < .001), with an R^2 of .031, which indicates that Technical Competency total accounts for approximately 3.1% of the variance in overall course GPA. When overall course GPA was predicted, it was found that Technical Competency total (β = 0.016, p <.001), meaning that for every point increase in total Technical Competency, there was a corresponding increase in overall course GPA of approximately 0.016. Closer examination of Technical Competency reveals that all of the subscales were positively correlated with overall course GPA.

The subscale Computer Competency (TC_Computer Competency), Pearson's $r(605) = .149$, $p < .001$, was found to be correlated to overall course GPA. A linear regression was calculated to predict overall course GPA based on the subscale TC_Computer Competency. A significant regression equation was found ($F(1, 603) = 16.40$, $p < .001$), with an R^2 of .026, which indicates that TC_Computer Competency accounts for approximately 2.6% of the variance in overall course GPA. When overall course GPA was predicted, it was found that TC_Computer Competency ($\beta = 0.023$, $p < .001$), meaning that for every point increase in TC_Computer Competency, there was a corresponding increase in overall course GPA of approximately 0.023.

The subscale Internet Competency (TC_Internet Competency), Pearson's $r(605) = .118$, $p < .05$, was found to be correlated to overall course GPA. A linear regression was calculated to predict overall course GPA based on the subscale TC_Internet Competency. A significant regression equation was found ($F(1, 603) = 7.33$, $p < .050$), with an R^2 of .012, which indicates that TC_Internet Competency accounts for approximately 1.2% of the variance in overall course GPA. When overall course GPA was predicted, it was found that TC_Internet Competency ($\beta = 0.015$, $p > .050$), meaning that for every point increase in TC_Internet Competency, there was a corresponding increase in overall course GPA of approximately 0.015.

Hybrid courses GPA. Similarly, Hybrid Course GPA is positively correlated to overall technical competency, Pearson's $r(488) = .140$, $p < .001$. This suggests that TC are related to student success in hybrid courses. A linear regression was calculated to predict

Hybrid Course GPA based on the total Technical Competency score. A significant regression equation was found ($F(1,486) = 10.10$, $p < .050$), with an R^2 of .020, which indicates that Technical Competency total accounts for approximately 2.0% of the variance in Hybrid Course GPA. When Hybrid Course GPA was predicted, it was found that Technical Competency total ($\beta = 0.013$, $p < .050$), meaning that for every point increase in total Technical Competency, there was a corresponding increase in Hybrid Course GPA of approximately 0.013. Closer examination of Technical Competency reveals that one of the subscales were positively correlated with Hybrid Course GPA.

The subscale Internet Competency (TC_Internet Competency), Pearson's $r(488) = .173$, $p < .01$, was found to be correlated to Hybrid Course GPA. A linear regression was calculated to predict Hybrid Course GPA based on the subscale TC_Internet Competency. A significant regression equation was found ($F(1,486) = 13.88$, $p < .001$), with an R^2 of .028, which indicates that TC_Internet Competency accounts for approximately 2.8% of the variance in Hybrid Course GPA. When Hybrid Course GPA was predicted, it was found that TC_Internet Competency ($\beta = 0.024$, $p < .001$), meaning that for every point increase in TC_Internet Competency, there was a corresponding increase in Hybrid Course GPA of approximately 0.024.

Completely online courses GPA. Completely Online Course GPA is positively correlated to overall Technical Competency, Pearson's $r(246) = .150$, $p < .050$. This suggests that technical competencies are related to student success in completely online courses. A linear regression was calculated to predict completely online course GPA based on the total Technical Competency score. A significant regression equation was found ($F(1,244) = 3.54$, $p > .050$), with an R^2 of .014, which indicates that Technical

Competency total accounts for approximately 1.4% of the variance in completely online course GPA. When completely online course GPA was predicted, it was found that Technical Competency total ($\beta = 0.013$, $p > .050$), meaning that for every point increase in total Technical Competency, there was a corresponding increase in completely online course GPA of approximately 0.013. Closer examination of Technical Competency reveals that 1 of the subscales were positively correlated with completely online course GPA.

The subscale Computer Competency (TC_Computer Competency), Pearson's $r(246) = .173$, $p < .050$, was found to be correlated to completely online course GPA. A linear regression was calculated to predict completely online course GPA based on the subscale TC_Computer Competency. A significant regression equation was found ($F(1,244) = 3.86$, $p > .050$), with an R^2 of .016, which indicates that TC_Computer Competency accounts for approximately 1.6% of the variance in completely online course GPA. When completely online course GPA was predicted, it was found that TC_Computer Competency ($\beta = 0.020$, $p > .050$), meaning that for every point increase in TC_Computer Competency, there was a corresponding increase in completely online course GPA of approximately 0.020.

Hyflex courses GPA. Unlike the other course delivery methods, Hyflex course GPA is not positively correlated to overall personal attributes or any of the subscales, Pearson's $r(82) = -.093$, $p > .050$.

Technical Knowledge and Grade Point Average

To test for any correlation between technical knowledge and grade point average, a Bivariate Correlations test (Pearson's) test was run with a 1-tailed significance. All corresponding subscales were also included in the test. The results are below (see Table 20).

Table 20.
Technical Knowledge and GPA

Scale & Subscales	Overall GPA		Hybrid Courses GPA		Online Courses GPA		Hyflex GPA	
	r	*p*	*r*	*p*	*r*	*p*	*r*	*p*
Technical Knowledge Total	.072	.039*	.140	.001*	.057	.185	-.155	.082
Personal Computer & Internet Specification	-.026	.261	.047	.149	.019	.383	-.048	.333
Technology in Your Life	-.038	.177	.049	.142	-.029	.325	-.129	.124
Technology Usage	.078	.028*	.130	.002*	.021	.369	-.200	.036
Technology Vocabulary	.202	.000*	.197	.000*	.145	.012*	-.017	.440

Overall GPA. Overall GPA is positively correlated to overall Technical Knowledge (TK), Pearson's r(605) = .072, $p < .050$. This suggests that TK are related to overall student success. A linear regression was calculated to predict overall course GPA based on the total Technical Knowledge score. A significant regression equation was found ($F(1,603) = 1.22$, $p > .050$), with an R^2 of .002, which indicates that Technical Knowledge total accounts for approximately .2% of the variance in overall course GPA. When overall course GPA was predicted, it was found that Technical Knowledge total ($\beta = 0.006$, $p > .050$), meaning that for every point increase in total Technical Knowledge, there was a corresponding increase in overall course GPA of approximately 0.006. Closer examination of Technical Knowledge reveals that two of the subscales were positively correlated with overall course GPA.

The subscale Technology Usage, Pearson's r(605) = .078, $p < .050$, was found to be correlated to overall course GPA. A linear regression was calculated to predict overall course GPA based on the subscale Technology Usage. A significant regression equation was found ($F(1,603) = 3.37$, $p > .050$), with an R^2 of .006, which indicates that Technology Usage accounts for approximately .6% of the variance in overall course GPA. When overall course GPA was predicted, it was found that Technology Usage ($\beta = 0.020$, $p > .050$), meaning that for every point increase in Technology Usage, there was a corresponding increase in overall course GPA of approximately 0.020.

The subscale Technology Vocabulary, Pearson's $r(605) = .202$, $p < .001$, was found to be correlated to overall course GPA. A linear regression was calculated to predict overall course GPA based on the subscale Technology Vocabulary. A significant regression equation was found ($F(1,603) = 17.034$, $p < .001$), with an R^2 of .027, which indicates that Technology Vocabulary accounts for approximately 2.7% of the variance in overall course GPA. When overall course GPA was predicted, it was found that Technology Vocabulary ($\beta = 0.094$, $p < .001$), meaning that for every point increase in Technology Vocabulary, there was a corresponding increase in overall course GPA of approximately 0.094.

Hybrid courses GPA. Similarly, Hybrid Course GPA is positively correlated to overall TK, Pearson's $r(488) = .140$, $p < .001$. This suggests that TK are related to student success in hybrid courses. A linear regression was calculated to predict hybrid course GPA based on the total Technical Knowledge score. A significant regression equation was found ($F(1,486)=6.36$, $p<.050$), with an R^2 of .013, which indicates that Technical Knowledge total accounts for approximately 1.3% of the variance in hybrid course GPA. When hybrid course GPA was predicted, it was found that Technical Knowledge total ($\beta=0.014$, $p<.050$), meaning that for every point increase in total Technical Knowledge, there was a corresponding increase in hybrid course GPA of approximately 0.014. Closer examination of Technical Knowledge reveals that two of the subscales were positively correlated with hybrid course GPA.

The subscale Technology Usage, Pearson's $r(488) = .130$, $p < .05$, was found to be correlated to hybrid course GPA. A linear regression was calculated to predict hybrid course GPA based on the subscale Technology Usage. A significant regression equation was found ($F(1,486) = 6.50$, $p < .050$), with an R^2 of .013, which indicates that Technology Usage accounts for approximately 1.3% of the variance in hybrid course GPA. When hybrid course GPA was predicted, it was found that Technology Usage ($\beta=0.032$, $p<.050$), meaning that for every point increase in Technology Usage, there was a corresponding increase in hybrid course GPA of approximately 0.032.

The subscale Technology Vocabulary, Pearson's $r(488) = .197$, $p < .01$, was found to be correlated to hybrid course GPA. A linear regression was calculated to predict hybrid course GPA based on the subscale Technology Vocabulary. A significant regression equation was found ($F(1,486) = 13.80$, $p < .001$), with an R^2 of .028, which indicates that Technology Vocabulary accounts for approximately 2.8% of the variance in hybrid course GPA. When hybrid course GPA was predicted, it was found that Technology Vocabulary ($\beta = 0.095$, $p<.001$), meaning that for every point increase in Technology Vocabulary, there was a corresponding increase in hybrid course GPA of approximately 0.095.

Completely online courses GPA. Completely Online Course GPA is not correlated to overall Technical Knowledge, Pearson's $r(246) = .057$, $p > .050$. Closer examination of TK reveal that of the subscales, only Technology Vocabulary was correlated with online course GPA, Pearson's r(246) = .145, p<.050, which suggests that this is the most important factors of the Technology Knowledge as it relates to success in completely online courses. A linear regression was calculated to predict completely online course GPA based on the subscale Technology Vocabulary. A significant regression equation was found (F(1,244) = 5.40, p< .050), with an R^2 of .022, which indicates that Technology Vocabulary accounts for approximately 2.2% of the variance in completely online course GPA. When completely online course GPA was predicted, it was found that Technology Vocabulary (β = 0.098, p<.050), meaning that for every point increase in Technology Vocabulary, there was a corresponding increase in completely online course GPA of approximately 0.098.

Hyflex courses GPA. Unlike the other course delivery methods, Hyflex course GPA is not positively correlated to overall personal attributes or any of the subscales, Pearson's r(82) = -.153, p> .050.

Research Question 3: What role does student readiness play in explaining differences between FGS and NFGS students' success (GPA)?

To examine the role that student readiness plays in explaining differences between FGS and NFGS students' success, statistically significant differences of student readiness from RQ1 were entered as covariates for success factors as measured in RQ2. For example, because FGS and NFGS students differed in terms of their scores on the Life Factors measure, Life Factors scores were used as a covariate in an ANCOVA of FGS and NFGS student success.

ANCOVAs were performed for both overall GPA and GPA by delivery mode (online, hybrid, hyflex) as dependent variables with a Fixed Factor of First Generation

Student Status, and with Life Factors, Personal Attributes, Technical Competency, and Technical Knowledge as covariates.

In addition, significant subscales as determined by Research Question 2 (RQ2) (Reason, Skills, Time, all Personal Attributes Subscales, Technology Usage, Technology Vocabulary, Internet Competency and Computer Competency) were also included as covariates in ANCOVAs. The results are listed below and discussed separately.

Overall GPA Comparisons

Overall GPA and Life Factors. An ANCOVA of first generation status (FGS and NFGS) on overall GPA with Life Factors scale totals as a covariate showed that there were no main effects of FGS Status, F=(1, 602) = 2.92, p=.088, ηp^2 =.005 on overall GPA, that is, FGS and NFGS students did not differ on overall GPA when controlling for the effect of Life Factors scores.

Because RQ1 indicated that Life Skills was the only subscale of Life Factors that was statistically significant, it is possible that the statistically significant difference for the overall scale could be explained completely by the statistically significant subscale difference. Therefore, a similar ANCOVA was run using Life Skills as the covariate. The results indicated a main effect for FGS status on overall GPA, even when controlling for the effect of Life Points, F=(1, 602) = 14.04, p=.000, ηp^2 =.023.

Overall GPA and Personal Attributes. An ANCOVA of first generation status (FGS and NFGS) on overall GPA with Personal Attributes scale totals as a covariate revealed no main effects of FGS Status, F=(1, 480) = 1.863, p=.173, ηp^2 =.003 on overall GPA. That is, FGS and NFGS students did not differ on overall GPA when controlling for the effect of Personal Attributes Total scores.

Because RQ1 indicated that Persistence and Procrastination were the only subscales of Personal Attributes that were statistically significant, it is possible that the statistically significant difference for the overall scale could be explained completely by the statistically significant subscale difference. Therefore, a similar ANCOVA was run using Persistence as the covariate. The results indicated a main effect for FGS status on overall GPA, even when controlling for the effect of Persistence, F=(1, 602) = 4.50, p=.034, ηp^2 =.007.

Additionally, an ANCOVA was run using Procrastination as the covariate. The results indicated a main effect for FGS status on overall GPA, even when controlling for the effect of Procrastination, F=(1, 602) = 9.251, p=.002, ηp^2 =.015.

Overall GPA and Technical Knowledge. An ANCOVA Of first generation status (FGS and NFGS) on overall GPA with Technical Knowledge scale totals as a covariate revealed no main effects of FGS Status, F=(1, 602) = 3.50, p=.062, ηp^2 =.006 on overall GPA. That is, FGS and NFGS students did not differ on overall GPA when controlling for the effect of Technical Knowledge Total scores.

Because RQ1 indicated that Technology Usage and Technical Vocabulary were the only subscales of Technical Knowledge that was statistically significant, it is possible that the statistically significant difference for the overall scale could be explained completely by the statistically significant subscale difference. Therefore, a similar ANCOVA was run using Technology usage and technical vocabulary as separate covariates. The results indicated a main effect for FGS status on overall GPA, even when controlling for the effect of technology Usage, F=(1, 602) = 4.0, p=.047, ηp^2 =.007.

Additionally, an ANCOVA was run using Technical Vocabulary as the covariate. The results indicated a main effect for FGS status on overall GPA, even when controlling for the effect of Procrastination, F=(1, 602) = 17.01, p=.000, ηp^2 =.027.

Exclusively Online Course GPA Comparisons

Exclusively online course GPA and life factors. An ANCOVA Of first generation status (FGS and NFGS) on exclusively online course GPA with Life Factors scale totals as a covariate revealed no main effects of FGS Status, F=(1, 243) = 12.47, p=.917, ηp^2 =.000 on exclusively online courses GPA. That is, FGS and NFGS students did not differ on online course GPA when controlling for the effect of Life Factors scores.

Because RQ1 indicated that Life Skills was the only subscale of Life Factors that was statistically significant, it is possible that the statistically significant difference for the overall scale could be explained completely by the statistically significant subscale difference. Therefore, a similar ANCOVA was run using Life Skills as the covariate. The results indicated a main effect for FGS status on exclusively online courses GPA, even when controlling for the effect of Life Points, F=(1, 243) = 18.50, p=.000, ηp^2 =.071.

Exclusively online course GPA and personal attributes. An ANCOVA of first generation status (FGS and NFGS) on Exclusively Online Course GPA with Personal Attributes scale totals as a covariate revealed no main effects of FGS Status, F=(1, 243) = 1.17, p=.697, ηp^2 =.001 on exclusively online course GPA. That is, FGS and NFGS students did not differ on overall GPA when controlling for the effect of Personal Attributes Total scores.

Because RQ1 indicated that Persistence and Procrastination were the only subscales of Personal Attributes that were statistically significant, it is possible that the statistically significant difference for the overall scale could be explained completely by the statistically significant subscale difference. Therefore, a similar ANCOVA was run using Persistence as the covariate. The results indicated a main effect for FGS status on exclusively online course GPA, even when controlling for the effect of Persistence, F=(1, 243) = 4.61, p=.033, ηp^2 =.019.

Additionally, an ANCOVA was run using Procrastination as the covariate. The results indicated a main effect for FGS status on exclusively online course GPA, even when controlling for the effect of Procrastination, F=(1, 243) = 4.32, p=.039, ηp^2 =.017.

Exclusively online course GPA and technical knowledge. An ANCOVA Of first generation status (FGS and NFGS) on exclusively online courses with Technical Knowledge scale totals as a covariate revealed no main effects of FGS Status, F=(1, 234) = .002, p=.964, ηp^2 =.000 on exclusively online course GPA. That is, FGS and NFGS students did not differ on exclusively online course GPA when controlling for the effect of Technical Knowledge Total scores.

Because RQ1 indicated that Technical Vocabulary and Technology Usage were the only subscales of Technical Knowledge that was statistically significant, it is possible that the statistically significant difference for the overall scale could be explained completely by the statistically significant subscale difference. Therefore, a similar ANCOVA was run using Technology usage and technical vocabulary as separate covariates. The results indicated a main effect for FGS status on exclusively online course GPA, even when controlling for the effect of Technology Vocabulary, F=(1, 243) = 5.40, p=.021, ηp^2 =.022.

Additionally, an ANCOVA was run using Technical Usage as the covariate. The results indicated no main effect for FGS status on exclusively online course, even when controlling for the effect of Technical Usage, F=(1, 243) = .070, p=.792, ηp^2 =.000.

Hybrid Course GPA Comparisons

Hybrid course GPA and life factors. An ANCOVA Of first generation status (FGS and NFGS) on Hybrid course GPA with Life Factors scale totals as a covariate revealed no main effects of FGS Status, F=(1, 485) = 1.65, p=.200, ηp^2 =.003 on Hybrid courses GPA. That is, FGS and NFGS students did not differ on Hybrid course GPA when controlling for the effect of Life Factors scores.

Because RQ1 indicated that Life Skills was the only subscale of Life Factors that was statistically significant, it is possible that the statistically significant difference for the overall scale could be explained completely by the statistically significant subscale difference. Therefore, a similar ANCOVA was run using Life Skills as the covariate. The results indicated a main effect for FGS status on Hybrid courses GPA, even when controlling for the effect of Life Points, F=(1, 485) = 47.47, p=.000, ηp^2 =.089.

Hybrid course GPA and personal attributes. An ANCOVA of first generation status (FGS and NFGS) on Hybrid Course GPA with Personal Attributes scale totals as a covariate revealed no main effects of FGS Status, F=(1, 485) = .758, p=.384, ηp^2 =.002 on Hybrid course GPA. That is, FGS and NFGS students did not differ on Hybrid GPA when controlling for the effect of Personal Attributes Total scores.

Because RQ1 indicated that Persistence and Procrastination were the only subscales of Personal Attributes that were statistically significant, it is possible that the statistically significant difference for the overall scale could be explained completely by the statistically significant subscale difference. Therefore, a similar ANCOVA was run using Persistence as the covariate. The results indicated a main effect for FGS status on Hybrid course GPA, even when controlling for the effect of Persistence, F=(1, 485) = 4.607, p=.032, ηp^2 =.009.

Additionally, an ANCOVA was run using Procrastination as the covariate. The results indicated a main effect for FGS status on Hybrid course GPA, even when controlling for the effect of Procrastination, F=(1, 485) = 19.41, p=.000, ηp^2 =.038.

Hybrid Course GPA and Technical Knowledge

An ANCOVA of first generation status (FGS and NFGS) on Hybrid courses with Technical Knowledge scale totals as a covariate revealed no main effects of FGS Status, F=(1, 485) = 2.16, p=.142, ηp^2 =.004 on Hybrid course GPA. That is, FGS and NFGS students did not differ on Hybrid course GPA when controlling for the effect of Technical Knowledge Total scores.

Because RQ1 indicated that Technical Vocabulary and Technology Usage were the only subscales of Technical Knowledge that was statistically significant, it is possible that the statistically significant difference for the overall scale could be explained completely by the statistically significant subscale difference. Therefore, a similar ANCOVA was run using Technology usage and technical vocabulary as separate covariates. The results indicated a main effect for FGS status on Hybrid course GPA, even when controlling for the effect of Technology Vocabulary, F=(1, 485) = 13.79, p=.000, ηp^2 =.028.

Additionally, an ANCOVA was run using Technical Usage as the covariate. The results indicated a main effect for FGS status on Hybrid course, even when controlling for the effect of Technical Usage, F=(1, 485) = 7.08, p=.008, ηp^2 =.014.

Hyflex Course GPA Comparisons

Hyflex course GPA and life factors. An ANCOVA Of first generation status (FGS and NFGS) on Hyflex course GPA with Life Factors scale totals as a covariate revealed no main effects of FGS Status, F=(1, 79) = .031, p=.860, ηp^2 =.000 on Hyflex courses GPA. That is, FGS and NFGS students did not differ on Hyflex course GPA when controlling for the effect of Life Factors scores.

Because RQ1 indicated that Place was the only subscale of Life Factors that was statistically significant, it is possible that the statistically significant difference for the overall scale could be explained completely by the statistically significant subscale difference. Therefore, a similar ANCOVA was run using Place as the covariate. The results indicated a main effect for FGS status on Hyflex courses GPA, even when controlling for the effect of Place, F=(1, 79) = 5.850, p=.018, ηp^2 =.069.

Hyflex Course GPA and personal attributes. An ANCOVA of first generation status (FGS and NFGS) on Hyflex Course GPA with Personal Attributes scale totals as a covariate revealed no main effects of FGS Status, F=(1, 79) = .080, p=.779, $\eta \boldsymbol{p^2}$ =.001 on Hyflex course GPA. That is, FGS and NFGS students did not differ on Hyflex GPA when controlling for the effect of Personal Attributes Total scores.

Hyflex course GPA and technical knowledge. An ANCOVA Of first generation status (FGS and NFGS) on Hyflex courses with Technical Knowledge scale totals as a covariate revealed no main effects of FGS Status, F=(1, 79) = .031, p=.861, ηp^2 =.000 on Hyflex course GPA. That is, FGS and NFGS students did not differ on Hyflex course GPA when controlling for the effect of Technical Knowledge Total scores.

Because RQ1 indicated that Technology Usage were the only subscales of Technical Knowledge that was statistically significant, it is possible that the statistically significant difference for the overall scale could be explained completely by the statistically significant subscale difference. Therefore, a similar ANCOVA was run using Technology usage as covariates. The results indicated no main effect for FGS status on Hyflex course GPA, even when controlling for the effect of Technology Usage, F=(1, 79) = 1.94, p=.167, ηp^2 =.024.

CHAPTER V

DISCUSSION

Summary

This study sought to quantitatively explore First Generation Students' readiness to take distance learning courses in a small upper-division university in the southwestern United States. First, in research question one (RQ1), differences between FGS and NFGS were compared in terms of readiness, which was defined as a combination of attributes and their subscales, Life Factors (LF – Place, Reason, Resources, Skills, and Time), Personal Attributes (PA – Academic Attributes, Willingness to Seek Help, Locus of Control, Persistence, Procrastination, and Time Management), Technical Competency (TC – Computer Competency and Internet Competency), and Technical Knowledge (TK – Personal Computer/Internet, Technology in Your Life, Technology Usage, and Technical Vocabulary).

Second, research question two (RQ2) examined the relationship between student readiness overall and success (defined as GPA). Finally, research question three (RQ3), examined the relationships between student readiness, student success, and FGS status by selecting statistically significant relationships from FGS Status and Student Success

(GPA). This chapter provides interpretation and discussion of each question, in order. Limitations and future research opportunities are also discussed.

Question 1: Do FGS and non-FGS differ in terms of student readiness?

This question addressed the issue of whether first generation students and non-first generation students differ in terms of student readiness. As discussed in chapter 3, student readiness in this study was measured using the following scales from the SmarterMeasures Readiness survey: Life Factors (LF – Place, Reason, Resources, Skills, and Time), Personal Attributes (PA – Academic Attributes, Willingness to Seek Help, Locus of Control, Persistence, Procrastination, and Time Management), Technical Competency (TC – Computer Competency and Internet Competency), and Technical Knowledge (TK – Personal Computer/Internet, Technology in Your Life, Technology Usage, and Technical Vocabulary). The purpose of this question was to discover if FGS were more or less prepared to take distance learning courses than their NFGS counterparts.

It was hypothesized that first generation students would have lower student readiness scores than non-first generation students because many first generation students have less experience and are less prepared to take higher education courses. First generation students typically have lower GPAs in comparison to non-first generation students (Lee, Sax, Kim, & Hagedorn, 2004). FGS also score lower on standardized testing (Bui, 2002; Choy, 2001; Warburton, Bugarin, & Nunez, 2001). This hypothesis was only partially supported. Statistically significant results are discussed in more detail below.

Life Factors

Overall there was no evidence to support a difference in the Life Factors total scores for FGS and NFGS; however there was a significant difference in the subscale Skill. As discussed in Chapter 3, the Skill subscale measures students' self-perception of their ability to be successful, also defined as self-efficacy. A t-test indicated that Skill scores were significantly higher for FGS (M=13.94, SD=2.342) than NFGS (M=13.32, SD=2.56), $t(603) = 3.03$, $p < .050$, $d = .253$. FGS had higher/lower self-efficacy scores than NFGS, which contradicts/supports previous research because typically, FGS have lower self-confidence and NFGS (Cushman, 2007). One hypothesis was that because FGS are typically more likely to be female, older, and come from lower income families than NFGS (Engle, Bermeo and O'Brien, 2006), it could be that FGS in this study were older, had more life experiences, and thus higher self-efficacy or that the older the student, the more life experiences he/she has and therefore the higher their confidence or self-efficacy level could be. Descriptive tests confirmed that the mean age for FGS (M=34.75, SD=11.07) was higher than for NFGS (M=29.53, SD=7.96) and this difference was found to not be statistically significant.

Since age was not statistically significant, perhaps the students' classification could shed some light on why there was a difference. One would think that the higher a students' classification, the higher their success, and as such the higher their confidence. Concannon and Barrow (2012) found self-efficacy scores differed among first-year and non-first year engineering students. It was found that first-year student scores were lower than non-first year student scores. Perhaps this could explain why FGS scored higher than

NFGS. Further self-efficacy testing with an instrument dedicated to solely measuring self-efficacy could be conducted to discover if this was truly significant.

Personal Attributes

As previously defined, the total Personal Attribute score is comprised of the sum of five subscales – academic success, willingness to seek help, locus of control, persistence and procrastination. Results from the analyses also found that there was a statistically significant difference in the total Personal Attributes scores between FGS and NFGS *(M*=74.24 *SD*=.476*)* and NFGS *(M*=72.60 *SD*=.398*)*, t (603) = 2.63, p< .050, d= 3.7). Surprisingly, FGS scored higher than NFGS. Perhaps, similar to research question 1, age could explain the difference. Older students tend to have more successes (and failures) than younger students; as a result, older students are more likely to understand the importance of seeking help early, or believe that they have a certain level of influence and control over their desired outcomes. In comparison to younger students, older students tend to have a stronger sense of internal locus of control (Graham, 2007), and since the FGS in the study were on average older than the NFGS, this could possibly explain the reason for higher locus of control scores.

FGS also scored higher than NFGS on every personal attributes subscale, though only persistence and procrastination were statistically significant. The FGS mean persistence scores *(M=12.44, SD=.115)* were slightly higher than mean scores for NFGS *(M=11.83, SD=.090)* and the mean procrastination scores for FGS *(M=11.53, SD=.153)* were slightly higher than mean scores for NFGS *(M=11.02, SD=.128).* The results were once again contrary to what was expected. Previous research showed that FGS have less persistence and are twice as likely to leave college without earning a degree (Engle, Bermeo, & O'Brien, 2006**).**

Although the findings from the results of this study are contrary to what the recent literature states about FGS, on a program level, administrators should be aware of their scores as early as possible, preferably before the first semester begins. By making the scores known early, administrators can identify students to monitor as the student progresses throughout the program. Administrators can use the results to develop support programs that provide early intervention if students start to show signs of failure.

Student support services make a significant difference in persistence (Crawford Sorey & Harris Guggan, 2008). Increased support has been correlated to increased academic motivation (Young, Johnson, Hawthorne & Pugh, 2011), and increased academic motivation can lend its self to increased persistence to complete coursework and eventually degree programs (Young, Johnson, Hawthorne & Pugh, 2011).

It has already been established that the FGS in the study on average were older than NFGS. Upon further investigation, some FGS could fall into what is known as a non-traditional student (Knowles, 1984). And as such, non-traditional students are self-directed, task-motivated, and have a significant amount of professional experiences (Kenner & Weinerman 2011). In addition, the FGS who participated in this study were in have prior successful academic experience in higher education. Though employment data was not gathered at the time of the study, one could assume that many of the older students were also employed full-time while attending school or were returning to school to further their careers; this could also have an impact on their overall motivation scores. With extensive professional work experience, they should have an increase in the development of practical knowledge used in the workplace (Kenner & Weinerman, 2011; Sternberg & Caruso, 1985). Perhaps this can explain why the mean FGS score was higher than NFG in the following subscales: Willingness to Seek Help, Locus of Control, Persistence, Procrastination, and Time Management.

All of these attributes can be learned as part of practical knowledge in the workplace and also be transferred to academic environments. Perhaps in the future, the survey questions could be revised to include more questions about the students' current employment status, years of professional work experience and type of employment (e.g. white collar vs. blue collar).

Technical Competency

There were no significant differences between FGS and NFGS in terms of technical competency. Both groups scored generally the same in all areas of technical competency. As was discussed in Chapter 3, Technical Competency, which included the following subscales: Computer Competency, and Internet Competency, measures the basic skills needed to attend and participate in a virtual class. Participants were asked to answer questions about how to save and print a document, and what steps to perform to perform basic internet searches. While it was hypothesized that FGS would have lower technical skills as previous research has documented (Collier & Morgan, 2008), it is also possible that this would not be a difference between FGS and NFGS, because technology has become an integral part of everyone's lives; older students use technology in their jobs. Younger students or 'Digital Natives' have spent their entire lives around technology (Prensky, 2001). Basic technology and internet skill have become almost a requirement for any college student.

As mentioned earlier, in the study, it was found that among the participants, FGS were older than NFGS, which could also mean FGS have more work experience. Data on career achievement for this study were not available, but future research should examine whether this difference can be accounted for by career achievement. If not, this raises other interesting possible explanations. It may be that technology fluency has become so pervasive that it has erased basic-level technical competency differences between FGS and NFGS. If so, this may no longer be something that schools need to consider in their retention and recruitment efforts.

Continuing with this train of thought, one could argue that the testing was not advanced enough considering the saturation of technology. If so, the real question is not if FGS are less technically proficient in general than NFGS, but rather, do FGS have the basic technical skills to perform operations in academic-specific applications such as *Blackboard Learn and Adobe Connect*, which are both used heavily in distance education environments (Mune, Goldman, Huggins, Eby, Chan & Critty, 2015).

Basic Internet competences were also measured. Instead of placing the emphasis on basic internet searching, one could also argue that the importance should be placed on locating academic related databases and Boolean searches to perform to get the desired results, which is important to student success in higher education (Mullen, Herrick, Jordan, Lewis, & Thomas, 2010; Tyckoson, 2000), none of which were measured in the study.

In contrast, perhaps this seems unlikely given research which shows the digital divide is still significant (e.g., DiMaggio & Hargittai, 2001; Katz & Rice, 2002; Mossber, Mary, Tolbert & Stanbury, 2003; Norris, 2001). Another explanation could be socioeconomic status, which is related to technology access and career achievement. Data was collected on the participants' financial aid status. It was found that over 80% of the participants in this study received some sort of financial aid; however the type of financial aid (e.g. need-based or merit-based) was not collected. It could be that because many of the study participants received some type of financial assistance, they were of a lower socioeconomic status, and as a result, may have had less access to technology.

Technical Knowledge

As defined in Chapter 3, Technical Knowledge measure what one could refer to as technical literacy. Technical Knowledge includes the following subscales: personal Computer & Internet Ownership, Amount of Technology in Life, Technology Usage and Technical Vocabulary. Contrary to what was expected, with the exception of the technology usage and technical vocabulary subscales, there was no significant difference between FGS and NFGS. FGS scored slightly higher in technical vocabulary but slightly lower in technology usage with a mean of 13.40, and a standard deviation of 3.41 compared to that of NFGS (M=13.98, SD=3.35). This supports previous research that the digital divide is still significant (e.g., DiMaggio & Hargittai, 2001; Katz & Rice, 2002; Mossber, Mary, Tolbert & Stanbury, 2003; Norris, 2001). Perhaps FGS do not have as much access to technology as previously speculated.

Though not statistically significant, NFGS scored higher (M=48.05, SD=7.27) than FGS (M=46.95, SD=7.23) on the total Technical Knowledge scale. Again this supports the research on the continued existence of the Digital Divide, and how students from lower socioeconomic backgrounds may not have access to technology in their lives, may differ in terms of usage and also may have access to lower internet speeds (DiMaggio & Hargittai, 2001; Selwyn, 2004; Van Dijk, 2005).

By assessing students as early as possible in their program of study, academic administrators, faculty and instructional designers, can be better informed as they consider the adoption of certain technologies and also begin defining what types of supportive materials and training students need.

Implications

Due to the fact that technical skills are so critical to distance education courses, it is important that the initial technical assessment is conducted early in the students' entry into any distance education program such that remediation, if needed, can begin.

The majority of the significant differences in FGS and NFGS were in the areas of Personal Attributes, more specifically Personal Attributes Total score, Persistence and Procrastination. FGS scored higher than NFGS and as such were less prone to procrastinate and more likely to complete what they start. While this was contrary to what was originally hypothesized, it is important to have a baseline of data on which to build. Administrators could use this data to establish student support programs that will equip FGS and NFGS with the skills and strategies to not procrastinate, manage their time better, and also help them understand that they have a say-so in their ultimate overall success. At the course-level, to discourage procrastination, faculty can set intermediate deadlines for assignments, and send electronic reminders to students about upcoming due dates.

There was very little difference in total scores for Technical Knowledge and Competencies when comparing FGS and NFGS; however there were significant differences in Technology Usage and Technical Vocabulary. Administrators can support increased technology adoption and usage through investments in technical hardware around campus. For students at a distance, who may never visit the brick and mortar campus, administrators can encourage student technology usage through participation in discounted educational technology programs, such as Microsoft Student Advantage program which offers Microsoft Office 356 to enrolled students for no fee.

Research Question 2: What is the relationship between student readiness and grade point average (GPA) in exclusively online, hybrid, and hyflex courses?

The goal of this question was to discover if student readiness was related to student success in multiple format distance education courses, including hybrid, completely online, and hyflex. Though success can be defined a number of ways, in this study, success was defined as GPA. It was assumed that high readiness scores would correlate with high GPAs, as prior research has suggested (SmarterMeasure, 2011). A Cronbach's alpha test was run on the sample size of 605. The results in comparison to the SmarterMeasure™ results were presented in table 21:

Table 21.
Cronbach's Alpha Comparison

Scale	α SmarterMeasure™ Reported	α From Study Results
Life Factors	.76	.76
Personal Attributes	.80	.75
Technical Knowledge	.75	.76
Technical Competency	.38	.81

Similar to question 1, student readiness was defined by scores in the following scales-Life Factors, Personal Attributes, Technical Competency and Technical

Knowledge. As previously discussed in Chapter 3, readiness scores can indicate if a student will perform well in distance education environments. The instrument was designed to measure student readiness; the lower the score, the more likely students may not be prepared for distance learning environments.

Life Factors and GPA

Life factors and overall GPA. As stated in Chapter 4, Life Factors is a set of mostly external factors that assess elements currently in the students' lives that may impact their ability to be successful in distance education environments. Just as a reminder, Life Factor includes five subscales, namely, Time, Place, Reason/Motivation, Resources and Skills. Findings suggested that there was a positive correlation between Overall GPA and Life Scores total, and the LF subscales, Reason (motivation), Skills (Self-Efficacy) and Time. This was expected because researchers have shown that high levels of motivation and self-efficacy have an impact on success in distance learning environments. In an effort to better understand and subsequently prepare and support students, particularly FGS, as they enter into distance education environments, administrators should continue to use this type of assessments.

Life factors and GPA for hybrid courses. There was a positive correlation between GPA and Life Factors Total score, and the subscales Place, Reason, Resources, and Skills. This suggests that for every positive increase in the above mentioned scale and subscale scores, there would be an expected increase in Hybrid Course GPAs. This was not surprising because external factors such as having dedicated place to study and supportive resources are important to all students in distance education, and even more so for FGS. In addition, some external factors impact internal factors such as Reason

(Motivation) and Skills (Self-Efficacy). Reason, which can be further defined by internal or external motivation is also an important factor (and found to be positively correlated to success). Skills (Self-Efficacy), as discussed in Chapter 2, is the belief that one will be successful based on past experiences. In other words, if a student believes he/she will be successful, that has a more positive impact than if the student feels he/she will not be successful. Prior research has said FGS commonly enroll in distance education course without the necessary skills and attributes to succeed (Hukle, 2009; Kelly, 2009; Winogron, 2007).

How does student readiness scores specifically relate to Hybrid Courses? As discussed in Chapter 2, Hybrid courses are courses in which a fraction of the instruction occurs synchronously in class and another portion occurs outside of class, often asynchronously. The face-to-face course component would give FGS, who are often times more at risk of failure, increased opportunities for instructor-student and student-student interactivity, which as discussed in chapter 2 play a very crucial role for both FGS and NFGS (Hillman, Hills, & Gunawardena, 1994; Moore, 1989).

Of course other factors such as course design and assessment methods would also have an influence, but if one looked primarily at the learner, every increase in the overall Life Factor scores, one would expect to see an increase in hybrid course GPAs. In this case, this effect was large. This reaffirms prior research about this and suggests that higher education institutions should continue to use these constructs in their approach to helping FGS and NFGS students succeed.

Life factors and GPA for online courses. Similarly, there was found to be a positive correlation between the Life Factors total scores and Online Course GPA. In addition, all but one subscale, Resources, was also positively correlated to Online Course GPA. Place was positively correlated to GPA in completely online courses. This would be expected because the course is completely conducted online and a dedicated quiet space is necessary for concentration and study.

Reason was also positively correlated to Online Course GPA. Independent, self-regulated learning has the potential to be higher in online courses than any other course delivery type; this level increases in asynchronous environments. As a result, students have to be able to work more independently, set their own benchmarks and use more self-regulation when participating in exclusively online courses. Over a period of time, if the student is not properly motivated or their reasons to continue lessen, they may be more likely to get frustrated, feel isolated and eventually drop-out of the course.

Skills, which can also be equated to self-efficacy was positively correlated to GPA in completely online courses. Self-efficacy is important in exclusively online courses because students may not get the same amount of positive, immediate feedback as they would have received in a hybrid or completely face-to-face course. Couple that with the fact that many FGS have been found to be less prepared than their counterparts and since they may be already starting at a deficient, Skills/Self-Efficacy becomes even more important.

Time was also positively correlated to Online Course GPAs. All of the instruction in an online course takes place in a virtual environment, and many of the activities include responding to discussion board posts, blogs or wikis. These activities take more time than verbal communication as much of this communication occurs not in real-time, sometimes over a period of weeks. For FGS, who often come from lower socioeconomic backgrounds and have multiple factors competing for their attention, time may be limited. So again, having a dedicated amount of time for distance learning courses are important, and it's important to establish early.

Life factors and GPA for hyflex courses. With the exception of place, there were no correlations between Life Factor scores and student success in Hyflex Courses. Perhaps this was due to the nature of the course delivery method. At any given time within the semester, students can choose an attendance method which best fits their needs and schedule; moreover, students can always attend class in-person. For example a student could physically attend class in a brick and mortal room one week, and attend class synchronously remotely the next week. However, if a student does not have a dedicated place and sufficient time to study, this may lead to lower course performance. And if a student does not have a dedicated place to study, then he/she would not have a quiet place to view class (live or recorded). To further add the complexity, students can even choose to attend class completely asynchronously. By attending class asynchronously, students to not have real-time interactions with the instructor and other students as the content is being explained.

Implications

Life Factors are elements that cannot be corrected through mandated instruction or additional testing. It is just as important for the student to be aware of their Life Factor scores as it is for administrators and instructors, because ultimately students have to take the steps and make decisions that will support their efforts in distance education. By making academic support staff aware of the Life Factor scores, they would be able make more informed recommendations. For example, if a student has a low Time score and is made aware of their scores prior to enrolling in an online course, advisors or academic coaches could explain to the student that often, more time is required for online courses than face-to-face courses. If the student responds by stating that the online course fits better with his/her schedule, the advisor could recommend a hybrid or a hyflex course as it offers a bit more flexibility.

Because Life Factors and the majority of the subscales were positively related to success in completely online courses and hybrid courses, it is strongly recommended that LF be assessed prior to registration/ admittance into online and/or hybrid courses. If students perform low in these areas, universities can implement early intervention coaching programs which can monitor students' progress and educate them on the importance of having an appropriate place to study, dedicating adequate time for study, and having a support group while attending school.

Personal Attributes and GPA

As described in Chapter 3, Personal Attributes are internal factors that impact student success in distance education environments. Personal Attributes include the following subscales: Academic Attributes, Willingness to Seek Help, Locus of Control, Persistence, Procrastination, and Time Management. With the exception of Hyflex Courses, overall Personal Attribute scores positively correlated to success or GPA in all courses, hybrid courses, and online courses. This was expected because researchers have shown that if a student is more willing to seek help when needed, have a high locus of control and persistence, can effectively manage their time, limit their procrastination there will be a positive impact on success in distance learning environments. In an effort to better understand and subsequently prepare and support students, particularly FGS, as they enter into distance education environments, administrators should continue to use this type of assessments.

Personal attributes and overall GPA. Personal Attributes and every subscale was found to be positively correlated with overall success/GPA. This is of huge importance, because as stated previously, many of these skills can be developed and increased through early intervention programs and consistent coaching.

Personal attributes and GPA for hybrid courses. There was a positive correlation between GPA and Personal Attributes Total score, and the subscales Academic Attributes, Help Seeking, Locus of Control, Procrastination, and Time Management. This also suggests that for every positive increase in the above mentioned scale and subscale scores, there would be an expected increase in Hybrid Course GPAs. This was not surprising because internal factors such as willingness to seek help, locus of control and procrastination, and effective management are important to all students in distance education, and even more so for FGS, who historically score lower than NFGS.

It has been shown that most FGS students to not typically seek help; to seek help will be perceived as a form of failure. What happens often-times is FGS students in an already isolated distance education environment will not seek help until later in the course, and depending in the professor and the content, this may result in failure. However, if FGS who are less likely to seek help are identified early, flagged and monitored, when they show signs of struggle in a course, Faculty can intervene and direct them to the right places and resources to get the help needed. Same hold true for FGS who are prone to procrastinate or do not have effective time management skills. If Faculty are made aware of their scores prior to the start of the semester, they could proactively set midpoint deadlines and milestones for their assignments and class projects. They can also help them procrastinate less by setting frequent touch points and consistent communication of upcoming due dates and assignments.

How does student Personal Attributes readiness scores specifically relate to Hybrid Courses? The face-to-face course component of Hybrid courses would give FGS, who are often times more at risk to fail, increased opportunities for student accountability, and more opportunities for instructor monitoring through face-to-face questioning and interactions.

Personal attributes and GPA for online courses. Based on the results, as listed in Chapter 4, the total Personal Attributes score, and Locus of Control was positively correlated to Online Course GPA. More correlations with the subscales were expected, due to the fact that in a completely online course, students have more independence and flexibility and as such need to be able to use previously obtained skills and abilities, such as effective time management, lower procrastination, and increased persistence. In completely online courses, much of the course management falls on the students' shoulders; he/she may be primarily responsible for keeping on track, and setting intermediate milestone dates for major projects and assignments. Setting these milestones requires a high-level of confidence and a strong sense of control or belief that there efforts would lead to success in distance education courses.

Personal attributes and GPA for hyflex courses. Unlike all of the other course delivery types, there was not positively correlated to the Personal Attribute total scale or any the PA subscales. It was not a surprise that none of the Personal Attributes subscales would be correlated, simply because of the nature of Hyflex course delivery. Students in

Hyflex course have the freedom to decide how and when they will participate in class. Students can either chose to attend synchronously online or in person, or they can participate asynchronously through watching pre-recorded live lectures and completing activities within the LMS. Because students are able to choose how they participate in class, if they have the ability to self-regulate, they can choose to attend class in a different mode.

Implications

The implications of this are very substantial, as the readiness scores have a direct impact on the students' grades and success. Typically FGS students are underprepared, and sometimes lack the necessary skills to successfully navigate higher education systems (Engle, Bermeo, & O'Brien, 2006). Because of the significant impact, extra efforts to provide student support are substantiated. The support could be in the form of early intervention programs, learning communities and early intervention programs. Any intervention that will support their initial transition to college would be helpful.

What was found to be even more impactful on FGS success in higher education environments was oddly enough, the relationships and the trust students establish with key staff and through interactions with Faculty and other students (Lohfink & Paulsen, 2005; Nunez & Cuccaro-Alamin, 1998; Richardson & Skinner, 1992).

To support student persistence as they not only successfully complete courses but eventually graduate, practical support such as increased financial aid, scholarships, grants and work-study assignments should also be considered by administrators (Engle, Bermeo, & O'Brien, 2006).

Technology and GPA

As defined in Chapter 3, Technical Competency measured the basic level of computer and internet proficiencies. From the results of the testing in research question 1, there were no significant differences between FGS and NFGS Technical Competency readiness scores; however there were positive correlations between Technical Competency Total scores and Overall GPAs, Hybrid Course GPAs and Online Course GPAs.

Technical Knowledge is calculated by the sum of the scores in four subscales- Personal Computer & Internet Specification, Technology in Your Life, Technology Usage and Technology Vocabulary. There was a positive correlation between total Technical Knowledge scores and success in Overall GPA and Hybrid Courses. It was also found that Technology Usage was positively correlated to overall GPA, Hybrid courses and Hyflex courses. Technology Usage refers to the students' ability to operate and use various types of technologies and related software; however it does not cover social media applications such as twitter and other online options.

Implications

Although there was no statically significant differences between FGS and NFGS this does not imply that this type of testing is not needed. Technical fluency which includes both Computer Competency and Internet Competency is needed. It is beneficial to have FGS tested prior to the start distance education courses such that if remediation is needed, it can be provided for early in the students' career.

Overall Implications

The findings of this study suggest several implications for how faculty and administrators should provide student services, courses, and instructional teaching strategies to help promote retention and recruitment of FGS and NFGS for distance education. The implications indicate ways to help FGS succeed as they enroll in distance education courses.

Implications for Administrators

According to Menchacha & Bekele (2008), there are 5 factors for student success in distance education; leadership is an important one, in that, it supports the overall structure and logistics financially and from a management perspective. Leadership/Administration also impacts each of the other four areas. Leadership Factors includes, technology provisions, staff/student training, staff professional development, helpdesks, and support teaching staff.

As shown in the study results, student readiness has an impact on student success. If a student scores low in a particular area, the sole responsibility for student success should not fall completely on the shoulders of Faculty and students. Administrators have to provide and establish an environment that will not only support student success.

Before an effective and supportive environment can be established, administrators need to know and understand the current environment. We cannot provide assistance to a student if we do not know what type of assistance is needed. This baseline data can be obtained from the SmarterMeasures™ results. As such, it is recommended that each student prior to the start of their first course at the university, should be required to take distance education readiness testing, namely SmarterMeasures™.

Based on the results of the study, it was discovered that there was a significant difference between FGS and NFGS in terms of procrastination and persistence scores. According to Engle, Bermeo and O'Brien, (2006) from the Pell Institute for the Study of Opportunity in Higher Education, FGS are less likely to complete 4-year degrees than NFGS. This fact coupled with the persistent and procrastination scores would support the establishment of a system of ongoing student monitoring and coaching throughout the students' experience, particularly when a student is deemed to be more at-risk.

Implications for Faculty & Support Staff

At the core of instructional design is the learner and the learner analysis. It is almost impossible to develop effective and relevant instruction without knowing your learner-base, including strengths and weaknesses. For example, an instructor cannot teach a person how to be a pilot if the student does not fully understand the basic concept of lift. In the same thread, technology is, at its core, one of the most common aspects of any distance education course. An instructor cannot teach the basic concepts of accounting in an online course, if students do not possess adequate technical skills or readiness to take an online course.

The research results revealed significance in the readiness scores and performance between FGS and NFG in all but 1 type of distance education course delivery methods. These scores include many student life factors and personal attributes such as time management and locus of control. By being made aware of the student readiness scores early, Faculty will be able to tailor or adjust their instruction and teaching methods. For example, if a student scores low in time management, and has many competing external factors such as family and work, then at the course level it may be helpful to publish the complete course schedule in advance, provide reminders of due dates along the way, provide frequent communication with the student and use module-based design in their course structures. If a student scores low in self-efficacy and locus of control, it may be helpful to provide regular constructive feedback, praising the student when needed, mid-term progress reports, and additional opportunities for frequent student-to-student, faculty-to-student and content-to-student interactivity.

The results of the readiness instrument can also be helpful for advisors who work with students on developing their course schedules. For example, if a student scores lower in overall readiness, the advisor can recommend more hybrid or hyflex courses where there is less reliance on technical proficiency and self-regulation.

Implications for Students

In its most simplistic state, the primary focus of this study is student success and how faculty and administrators can create an environment which maximizes the possibility of success and retention while minimizing failures and drop-out rates in today’s age of expanding online course modalities. FGS are already more likely to have lower incomes, married with children, and older than NFGS (Nunez & Curraro, 1998), and as a result they already at a disadvantage. To compound matters, FGS are also typically less academically prepared than their counterparts (Terenzini, et.al , 1996). Collectively this is why it is so important for FGS to be assessed for readiness as early as possible in their program of study.

Limitations

Study Sample

The institution that was selected for this study was selected due to its large number of high-risk FGS students. However, data were only available for approximately 600 of the more than 4000 student population. To get a more accurate picture of FGS in distance education environments, a larger sample within the university would have been beneficial. Higher participation could be achieved by making the SmarterMeasures™ assessment a requirement of all entering students at the university. Currently, each entering student at the university is required to take several entrance exams which assess current levels for reading and math proficiencies. It would be desirable to also require distance education readiness testing for all incoming FGS and NFGS students into the university; this would increase the amount of the sample.

Most of the participants were education or business majors; it would be more diverse and also more helpful to each of the college deans and department chairs if more students completed the assessment, or if it was required for all incoming first year students.

In addition to the type of major, current employment status was not collected. It was found in the study that the mean age of FGS was 35. One would assume that many of these students were either head of household or working at least part-time while also attending school. If a student was working at least part-time while also attending school, as many FGS do, it would be interesting to see if their work status and concurrent demands on their time had an impact on procrastination, time management and even willingness to seek help due to being unable to meet with support staff during normal hours of operation. Furthermore, if more information on family status, number of children, and their involvement in extra-curriculum activities would also give a better profile or insight as to what external life factors may have an impact on their higher education pursuits.

Not first-semester FGS

It is also important to note that the participants in this study were not first semester, FGS. Because the university at the time only admitted junior, sophomore and graduate students, the students in this study had already had at least two years of experience in higher education. In other words, the students were not completely new to attending college, and the students who were no successful had already dropped out.

Comparing Apples to Apples

It was found when examining the data, there not an equal distribution of the number of Hyflex, exclusively online, hybrid and Hyflex courses, among the participants. Some participants did not take any Hyflex courses, while other participants may have had all hybrid or all lecture-based courses. At the time the participants completed the SmarterMeasures™ assessment, it was also the first semester Hyflex courses were offered at the university, as a result, there were very few Hyflex courses included in the data in comparison to the other modes of teaching. Currently, there are no entirely online programs at the university. While these varieties of courses are helpful, it would have been more beneficial if the study was conducted on a sample of participants who were enrolled in completely online programs, that way we are comparing apples to apples.

In addition to comparing scores within course delivery type, it would also be helpful for future studies to categorize and study students into three categories, high, medium and low experience taking online or distance education courses. By adding the additional classification, one can specially examine students with low online experiences and access their level of readiness and based on their readiness scores, individual coaching and supportive resources could be made available to them.

Types of Technical Tests

While the SmarterMeasures™ test assesses basic technical knowledge and competencies, it does not assess more advanced topics of use in applications such as Microsoft Word, PowerPoint and Excel. Intermediate to advanced proficiency of Word, PowerPoint and Excel is required in many courses, particularly in the business and education disciplines. For example, in many business accounting courses, Faculty require students to use MS Excel as part of their assignments. Often times, Faculty have to spend a substantial amount of time teaching the technology and not on accounting principles. At minimum prior knowledge of students' technical proficiencies in these areas would be helpful for Faculty at the course level as they design their courses.

Number and Types of Survey Questions

One of the strengths of the SmartMeasures™ instrument is that it measures a variety of attributes and skills that are important to learning in distance education environments. The assessment measures non-cognitive skills, such as motivation, determination and persistence. It also measures other external life factors such as resources and time commitment to devote to distance education efforts. Though not included in this study, the assessment also measures typing speed, reading rate/ recall, and learning styles. While the scope of this 124-question instrument provides a wealth of useful information, some sections of the assessment, namely Life Factors and Personal

Attributes contain very few individual questions. As a result, if one wanted to study further, a specific concept such as self-efficacy/skill, using the SmarterMeasures™ assessment in conjunction with an instrument or scale used to solely study general self-efficacy would be recommended, or additional items could be added to the beginning of the instrument.

As discussed in Chapter 2, a high-level of self-regulation is necessary for success in distance education course. At the time of the implementation of the survey, there were no questions in the SmarterMeasures™ survey that assessed self-regulation. Since then, SmarterMeasures™ has revised the survey and included as part of the survey a self-regulation component. This was perhaps a missed opportunity, which leads to the next section, Future Research Opportunities.

Future Research Opportunities

The limitation of the sample size was identified above. At the time of the study, the university was an upper-level division school, only admitting junior, senior and graduate level students. Most students came to the university after attending 2-year institutions in the local two-year institution system. Because the type of institution the students varied, so did their type and level of preparation. There was no uniformed technical training/preparation. This could have affected the technical scores.

Study First Semester First Generation Students

Beginning in the Fall 2016 Semester, the university in the study will begin accepting freshmen and sophomore students. This presents a new possibility for a more thorough study, because many of these students will be FGS *and* unlike the students in the study, they will also be first-semester FGS. This is important because it has been found that the first semester of FGS is a critical time in their post-secondary experiences and often times it is within these first two years, FGS drop-out. All the students in the study have attended at least 2 years of post-secondary education prior to being admitted into the university. There is no record of what happened during the first two years of the FGS journey. Did they drop out within the first few years? Did they receive adequate preparation, coaching and training during those first few years? It is unknown. With the future initiative of accepting freshmen and sophomore students, FGS' initial readiness and experiences during their first two years can be examined. Furthermore, as part of the survey instrument or data collection, the high school in which the student graduated from should also be included. This could be a possible method of finding out what high schools are preparing their students better.

The primary focus of this study was FGS and their readiness to take distance education courses. As stated previously, the participants in this study had at least 2 years of previous experience in higher education. Given the fact that the students have made it to the junior, senior or graduate level, one would also assume that they also had varying degrees of academic success. When the university begins admitting first year-first semester students, the focus could shift to the readiness of the entire student body, not just FGS. By focusing on the entire student body, up front, this could better inform administrators and faculty on which students to target for additional support and assistance.

Increased Diversity in Sample

Another factor in the sample size was lack of diversity. Most of the participants in the sample were economically disadvantaged minority students from a mid-sized southern Texas city. One would question if the results would be similar if future research included samples from universities located in different parts of the nation. This would also help avoid any skews or prejudices.

Hyflex Mixed-Method Study

At the initial time of the study, the Hyflex course delivery was new to the university. Hyflex or Hybrid-Flexible course design (Beatty, 2007, 2010, 2013) differs from any other the other course delivery methods in that students are able to decide when and how they attend course. Students can choose to attend and participate in class synchronously (in-person or via online) or asynchronously via viewing previously recorded lectures and through completing online activities. Other universities have implemented similar programs, namely the Math Emporium at Virginia Tech (Twigg, 2003), but unlike the hyflex model at the university in the study, students at Virginia Tech's Math Emporium must take all exams and quizzes in the university's 500-seat Emporium. The focus of the Math Emporium as with Hyflex course delivery is student choice and self-pace. The program has been criticized for lack of faculty involvement or student-faculty interaction because students are not always required to come to class. This could be a possible issue for FGS who, as discussed in Chapter 2, tend to succeed better with more interaction with faculty and other students. A possible future study could include a mixed-method study where hyflex students' readiness scores can be compared to preferred mode of attendance, and the frequency and quality of interactions with their instructor or teaching assistant.

Success Measured by Retention Rate

Finally this study did not address retention rates of FGS as they progressed throughout their program of study. Student success was defined by GPA. However, success can be further defined by retention, graduation and even length of time for after graduation a student obtained gainful employment or entered into graduate school. Intermediate data was not collected. For example, did students who perform poorly in a distance education course perform better in further distance education courses, or after any intervention? If so, what support or resources where most beneficial? Additional questions were not answered including, did FGS graduate at a higher or lower rate than NFGS? If so, what factors could be attributed to their success? If not, what barriers hindered their success? Longitudinal studies should be conducted to examine these questions by following students from their first semester through to graduation or their last semester. While the SmarterMeasure™ readiness indicator is a very useful tool to assess initial readiness, future researchers should build on the quantitative results of the assessment to identify both extremely low performing FGS and extremely high performing FGS, and follow-up with a more qualitative research focus in order to gain a full picture of FGS experiences and readiness in distance education courses.

APPENDICES

Appendix A
ADDITIONAL INSTITUTIONAL DATA COLLECTED

Student Demographic Information
Age
Gender
Race/ethnicity
Full-time/part-time status
First generation status
Receiving financial aid
Military status/veteran
Academic Related Student Information
Number of distance learning courses completed
Course grade
Course grade rate for students in the study
Online/hybrid vs. face-to-face
GPA for the semester
Number of previously enrolled distance education courses

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