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Predicting Online Course Success from Usage of an Online Tutoring System

Brett Miles

PREDICTING ONLINE COURSE SUCCESS FROM USAGE OF AN ONLINE TUTORING SYSTEM

by

BRETT MILES

(Under the Direction of Cordelia Zinskie)

ABSTRACT

As online learning continues to grow in higher education, quality online support services must also be offered in order to meet the needs of online students. This study sought to investigate the relationship between the use of an outsourced online tutoring system and course success in select University System of Georgia eCore introductory online gateway courses to determine the extent of the relationship between tutoring usage and course success. The researcher employed logistic regression analysis to determine if using online tutoring increased the students' probability for course success. Further, the researcher also studied the amount of usage to understand if greater usage increased the probability of course success. Findings from this study indicated that, for most courses studied, participation in online tutoring was associated with a greater likelihood of course success. However, the amount of tutoring received did not typically increase the probability of course success.

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SYSTEM

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BRETT MILES

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Major Professor: Cordelia Zinskie
Committee: Carl "Kip" Sorgen
                     Mete Akcaoglu

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DEDICATION

For Arlo and Quincy. This journey did not start with you, but it ended with you. No accomplishment could ever make me as proud as you do.

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CHAPTER ONE

INTRODUCTION

As the United States college student debt crisis continues to escalate, the nation is focusing on institutional outcomes, particularly progression and graduation rates. National and state efforts are designed to implement policies and programs to elevate graduation rates across the country. Some initiatives are focusing directly on students' first-year experiences as a crucial factor in their matriculation, identifying three gateway courses which, if successfully completed during a student's first year of college in one state, have been shown to increase the six-year graduation rate by 60 percentage points (Denley, 2017). With English Composition I and II as two of the three gateway courses, it is apparent that student writing skills are critical for academic and professional success. Additionally, because academic writing skills are a requirement in nearly all courses, writing preparedness is a crucial component of students' higher education journey. Unfortunately, students' academic writing preparedness is notably lacking across the nation, supporting a need for interventions and further support (Hembrough & Jordan, 2020).

The remaining gateway course is an introductory mathematics course. Although this course is designed to be a fundamental mathematics course, it continues to be a challenge and barrier to first year students. Harrell and Lazari (2020) noted that the success (or lack of success) in students' first college mathematics course has a substantial impact on academic progression. Failing to succeed in introductory mathematics and English courses can lead to a variety of outcomes that may delay or prohibit student progression, including changes in academic major, delay in graduation progression, and a decrease in the likelihood of immediate retention (Harrell & Lazari, 2020). While barriers to student writing and mathematics success do exist, including

readiness and lack of meaningful resources, institutions attempt to mitigate these barriers by providing traditional resources to improve student performance, including various methods of tutoring. Research shows that tutoring is beneficial to students' confidence and positively impacts their academic performance (Arco-Tirado et al., 2019; Williams & Takaku, 2011; Wingate, 2010).

While traditional tutoring, whether facilitated by faculty/staff or peers, is a standard fixture at the majority of higher education institutions, online tutoring is growing as a tutoring mode due to the rising presence of online education (Britto & Rush, 2013). Research shows that tutoring delivered online can be as effective as face-to-face tutoring (Richardson, 2009) and that online tutoring is an effective strategy to improve student course outcomes (Riley, 2019). However, there is a gap in the literature regarding more extensive research on online tutoring, including the relationship between usage of this resource and course success. It is imperative to understand the benefits of online tutoring systems to students enrolled in online courses. With online learning programs continuing to grow across the country, online students must have relevant and quality services at their convenience. Understanding the implications of the quantity of online tutoring usage on students' performance in online gateway courses can greatly assist state and national initiatives in retention and graduation efforts. Thus, the purpose of this quantitative study was to determine the extent of the relationship between the use of an outsourced online tutoring system and course success in online USG eCore gateway courses.

Background

As the education system in the United States struggles to meet clear outcomes like student retention and degree completion, one factor which successfully aids students toward these outcomes is institutional engagement and support. Theorists and researchers alike have stressed the need for a holistic experience for students to become, and stay, engaged in their

college experience to reduce the likelihood of dropping out prior to college completion (Sanford, 1967; Tinto, 1975; Tseng et al., 2020). Academic engagement and support are found in many forms, including the interaction between students and tutoring resources. Engagement with tutoring increases the likelihood of retention for beginning students (Reinheimer & McKenzie, 2014), and institutions must make these services available and accessible to students in order to promote student engagement. This background and review of the literature examines two theoretical frameworks: Tinto's (1975, 1987, 1993, 2012) Student Engagement Model and Sanford's (1967) Theory of Challenge and Support, along with the topics of student success in higher education, barriers to student success, traditional institutional academic resources, online learning, and online tutoring.

Theoretical Framework

Student success and college completion are more important to higher education institutions now than ever before. With declining enrollments and increasing costs, institutions must find ways to both recruit and retain students. While there are various relevant factors that contribute to success in higher education, Tinto's (1975, 1987, 1993, 2012) Student Engagement Model notes that two factors are of utmost importance in determining college success - student involvement and student engagement. Tinto claims that positive student outcomes can be attributed largely to student involvement and engagement within all aspects of their college experience. The theorist speaks of two areas of engagement, both academic and social, and while tutoring certainly fulfills the academic engagement, it also contributes toward social engagement as well. Live tutoring sessions, whether through peers, staff, or outsourced tutoring methods, require social interaction by design. Although the sessions are academically-based, due to the very nature of the interactions between two or more individuals, social engagement is present.

Furthering this idea of engagement as a predecessor to student success, Sanford's (1967) Theory of Challenge and Support stressed an appropriate balance of challenge and support for college students. He found that students need an educational environment which provides enough of a challenge to be engaging to the students while also providing enough support to balance the stress or anxiety that students may feel due to the challenges presented. Sanford noted that institutional support must be implemented and reinforced to students in order to keep students engaged and supported in their academic career.

College student engagement has multiple components, including academic engagement both inside and outside of the classroom. If students display motivation and help-seeking behaviors, then they are more likely to succeed (Shoulders et al., 2020). Further, if students display this engagement at the onset of their college career, they are more likely to continue to be engaged. This is especially important during the first year of college with gateway courses. While student success is imperative for both institutions and students, common barriers do exist, which the institutions have a responsibility to address and mitigate. This includes the implementation of quality academic resources for both face-to-face and online students, including online tutoring.

Student Success in Higher Education

As the average national debt increases for college students, institutions of higher education in the United States face increased scrutiny regarding retention and graduation rates. Currently, the national six-year graduation rate for students who started at four-year public institutions is 69%, with Georgia coming in at six percentage points below the national average at 63% (Causey et al., 2022). National and state measures have been implemented in the last decade to increase student success as it pertains to student retention, progression, and graduation

(RPG). These initiatives include Complete College America (CCA) and Complete College Georgia (CCG). Both programs aim to leverage resources and promote policies that will close equity gaps while increasing college completion rates (Complete College America, n.d.).

Georgia has focused on gateway courses with the implementation and expansion of CCG, along with other support initiatives in the University System of Georgia (USG) (Complete College Georgia, n.d.). Gateway courses, which include English Composition I, English Composition II, and an introductory mathematics course, are viewed as critical components in a student's freshman year. These courses have the potential to affect their entire collegiate career (Complete College Georgia, n.d.), as students must successfully progress through these gateway courses in order to obtain a college degree. Denley (2017) studied 10,000 USG students and found that students who successfully completed all three gateway courses in the first year of college had a six-year graduation rate of 66%, while those who did not successfully complete all three gateway courses in the first year had a six-year graduation rate of 6%. These data follow the trend of similar research completed, which indicated that students gain momentum when completing a full load of courses, including gateway courses, during their first year of college (Belfield et al., 2016). While a common prior practice to ensure that students had adequate support in these high-stakes courses was enrollment in pre-requisite remediation courses, recent research indicated that integrated support systems adequately prepared students to succeed in these crucial courses (Scott-Clayton et al., 2014). As opposed to prior models, which required students to take zero-credit hour courses prior to the actual credit-bearing course, the USG is now implementing current research-driven models where academic support systems are integrated into the course curriculum itself, either through a co-requisite model or integration of other academic support services within the course (Complete College Georgia, n.d.).

With English composition courses comprising two of the three gateway courses in Georgia, the importance of student success in fundamental writing is crucial. These general education courses are taken in a sequence and are designed to focus on skills required for effective reading comprehension and writing in a variety of contexts. Finally, an introductory mathematics course is considered the remaining gateway course. There are various introductory mathematics courses that students can complete to fulfill this requirement, with the goal of building a strong foundation in mathematical concepts, processes, and structure. Students often have the option to take these gateway courses through a mode of their choice–face-to-face, hybrid delivery (face-to-face and online), or completely online. Due to the rapid increase in online learning in recent years, it is apparent that online learning will continue to be an integral part of higher education moving forward.

Online Learning

Although online learning in higher education is now more widespread than ever before, distance education is not a new phenomenon. Distance learning has its roots in the late 1800s with correspondence learning; however, digital learning began its rapid growth in the late 1990s largely due to new technological innovations which facilitated more timely learning (Kentnor, 2015). Online learning provided access to higher education for populations who previously did not have the ability to obtain education, including working professionals, individuals with familial obligations, and those in areas with no surrounding educational institutions. As online learning began to serve more than just the privileged few and expand learning beyond the classroom, not only did students benefit. Institutions also benefited from online learning, as they were able to attract and retain student groups which they could not obtain otherwise. By 2011, 65% of higher education institutions reported that online learning was essential to their long-term

strategic plans (Allen & Seaman, 2011). Less than ten years later, in 2020, online learning experienced rapid disruption and growth due to the Coronavirus pandemic. By fall 2020, 75% of all undergraduate students in the United States were enrolled in at least one fully online course, while 44% of undergraduate students exclusively enrolled in a fully online schedule (NCES, 2022). Prior to the pandemic, in fall 2019, 6 million students were enrolled in at least one online course. By fall 2020, this number rose to 11.8 million students, an increase of 97% (NCES, 2022). After years of online learning growth and expansion, the COVID-19 pandemic finally solidified online education as not only an alternative form of instruction, but an essential form of instruction in higher education.

While higher education institutions typically determine their course and program modalities based on student demand, resource availability, and fiscal considerations, the state of Georgia operates select online programs through a collaborative statewide approach across public institutions. One such program, USG eCore, is a collaborative program of the University System of Georgia which offers core curriculum courses online through 21 public universities and colleges in the state (eCore Factbook, 2021). With a mission to provide USG students with an affordable way to take core curriculum courses in a fully online environment regardless of which USG institution they attend, USG eCore has grown substantially from its start (eCore Factbook, 2021). In the last ten years, eCore enrollment has grown by almost 900%, from 5,061 unduplicated enrollments in 2011 to 49,105 unduplicated enrollments in 2021 (eCore Factbook, 2021). While it is apparent that USG eCore is meeting enrollment and retention goals, which benefit the USG colleges and universities who offer this program, the program must also ensure that they are providing adequate student support services to its online learners to mitigate

academic barriers. Across the nation, there are several common barriers in higher education which prevent successful student progression.

Barriers to Student Success

College preparation is a top indicator in predicting student success in higher education, and research shows that college readiness (or lack of) is a key component in determining students' success (Pike et al., 2014). Pike et al. (2014) noted that readiness factors are significantly related to four-year and six-year degree attainment. These factors include components such as demographic data, standardized test scores for admission into college, class percentile rank, and intensity of high school coursework. This finding is consistent with additional research which has linked high school performance and student profile to success in college (Anderton et al., 2017). Differences in degree completion rates at higher education institutions are often attributed to differences in characteristics and profiles of enrolled students (DeAngelo et al., 2011). Additionally, the researchers found that students with higher high school grades and standardized testing scores are more likely to complete college than students with lower grades and scores. Currently, institutions assess potential for student success by screening incoming students based on readiness measures such as grade point average (GPA), standardized scores such as the Scholastic Aptitude Test (SAT) or American College Test (ACT), and class percentile rank. Institutions may use these to make an admission decision, a placement decision, or both. If students' high school experiences do not prepare them for college-level courses, they are likely to experience challenges in their college progression.

Another factor that can be a barrier to student success is the lack of adequate student resources at their institution of attendance (Millea et al., 2018). Typical resources include tutoring, counseling, advising, academic interventions, and library resources. Student resources

vary greatly amongst higher education institutions. Those smaller in size may lack student resources often found at larger, more robust institutions. Millea et al. (2018) noted that institutional spending on student resources can have a significant impact on student outcomes. Webber and Ehrenberg (2010) found that non-instructional expenditures positively influence student persistence and graduation rates, especially for institutions with lower entrance test score requirements. Because students may not be adequately prepared to take or succeed in higher education gateway courses, they are more likely to either withdraw or fail to successfully complete the course, therefore hindering their ability to progress through the remainder of their educational journey. Online students may incur additional barriers in obtaining the services that they need. Due to outdated support services and lack of financial resources, many institutions only offer online support services as an afterthought, choosing to support their face-to-face services as the primary charge.

Traditional Institutional Academic Resources

Colleges and universities typically employ several student service resources to assist students in overcoming barriers to their learning. This includes coordinating various student services outside of academic instruction to assist students, and many of these traditional resources are geared toward beginning students. A common student service available for college students is tutoring, and institutions may offer this in a variety of formats, including institutional staff/faculty tutoring, peer tutoring, and designated writing labs. Two of the most common tutoring formats on campuses are writing centers and Science, Technology, Engineering, and Mathematics (STEM) course tutoring. Typically, students seek tutoring of their own volition, as supplemental instruction/remediation is not required in most courses. However, this means that students must be aware of their own need for assistance and where to obtain this assistance, as

well as possess the motivation to seek out the assistance. Many students are not aware of the services available to them at their institution, including tutoring resources (Perry et al., 2020).

Research shows that when students utilize tutoring assistance, regardless of format, their performance typically improves. Williams and Takaku (2011) found that high levels of help-seeking behavior in college students resulted in better performance in composition classes. Wingate (2010) noted that students were more apt to utilize writing assistance when receiving positive formative feedback from tutors. Further, when students acted upon the formative feedback, they improved in the areas previously criticized (Wingate, 2010). DeFeo et al. (2017) found that students' help-seeking behaviors in mathematics courses ultimately benefited their academic performance. While most institutions offer these traditional methods of tutoring to students, another method becoming more prevalent due to the increasing percentage of distance learners is online tutoring.

Online Tutoring

As more colleges and universities add online courses and programs to their offerings, institutions must also provide relevant resources for these distance learners. Since enrollment in online courses has steadily increased at a higher rate than on-campus courses (Britto & Rush, 2013), it is imperative that institutions provide equal services to these online learners, including tutoring. Due to the COVID-19 pandemic, institutions and students were forced to transition to online learning in a very swift timeframe. This resulted in "on the fly" changes for both students and instructors. During this time, much research was conducted on online learning. Yu (2021) found that certain qualities in learners lent themselves to successful outcomes, including openness to a new experience. Further, Tseng et al. (2020) noted that flexible thinking supported student online engagement. Although expanding student services to include online support

requires a financial investment, Montelongo (2019) noted that this expense is justified due to equality, accessibility, and student outcomes. Like traditional tutoring, online tutoring has also been shown to improve student performance (Richardson, 2009; Riley, 2019; Roberts & Goss, 2009). Online tutoring methodologies attempt to mimic face-to-face interactions, with increased attention and research on the effects of different types of questioning and correspondence in online tutoring sessions (Hrastinski et al., 2021). In a study which compared students receiving face-to-face tutoring services versus online tutoring services in the same courses, Richardson (2009) found no significant difference in students' perceptions of the academic quality of their learning experience or in the approaches to studying that they adopted in those courses. Further, Riley (2019) found a significant correlation between online tutorials and scholarly scores for students.

Research has found that utilization of online tutoring services has positive implications for both student performance and student self-perception of performance. One study which explored the usage of an online writing tutoring service found that online feedback from the service greatly improved students' writing performance (Beccaria et al., 2019). Additionally, Ashford-Rowe and Howarth (2011) reported that students who utilized online tutoring overwhelmingly perceived the service to make a difference in their overall academic performance. In addition to course outcome improvements after obtaining composition tutoring, research indicates that online STEM course tutoring also benefits students. Rennar-Potacco et al. (2017) noted that online academic support for low-retention STEM courses had positive academic results. While there are various online tutoring services designed to serve the needs of college students, the online tutoring service explored in the current study is Tutor.com.

Tutor.com Online Tutoring Service

Tutor.com is a leading Outsourced Online Tutoring Service (OOTS) amongst various educational institutions. The service provides online coverage in more than 200 subject areas (Tutor.com, 2020), and many colleges, universities, and programs in the country utilize Tutor.com to provide comprehensive tutoring coverage for their online learners, including USG eCore. While Tutor.com offers expansive coverage, the service provides intensive support for writing. In addition to the general Essay Center where students submit their writing for detailed feedback and revision plans, students may also submit for grammar and documentation review, research and documentation assistance, and paragraph submission, in addition to receiving reading and writing assistance from a live tutor. Tutor.com also focuses on intensive mathematics support, offering coverage in all USG gateway mathematics courses in a variety of modes.

As one of the academic support services for students taking USG eCore courses, Tutor.com is a free option for students to seek help. The online tutoring platform is linked in their course(s), and this link takes them directly to the tutoring service. Once on the Tutor.com platform, students have four options: connect with a tutor now, schedule a tutoring session, submit a paper for review, or drop off a math question. Depending on the option selected by students, they receive either synchronous or asynchronous support from qualified tutors in the subject area, and this study included both modes of support in the tutoring usage data.

This study investigated the relationship between students' use of Tutor.com and their academic success in USG eCore gateway courses. While USG eCore does track Tutor.com tutoring usage, USG eCore had previously completed no comprehensive studies on the relationship between usage of the Tutor.com tutoring service and course success, thus has no

data to support the efficacy of overall online tutoring or lack thereof. On a broader scale, understanding the relationship between online tutoring usage and students' performance in introductory-level gateway courses can greatly assist state and national initiatives in retention and graduation efforts.

In summary, the purpose of this study was to investigate the relationship between the use of an online tutoring service and course success in the USG online eCore gateway English Composition and Mathematics courses to determine if utilizing online tutoring increases the probability of course success.

Statement of the Problem

Students' lack of academic preparedness is a considerable concern in higher education. While students must successfully complete two composition courses early in their college career, they must also employ academic writing for nearly all other courses as well. However, students often do not have the necessary writing skills to prepare them for success in their composition courses. Additionally, students must also complete an introductory mathematics course during their first year of college for which they may not be prepared. Intentional and substantiated student support structures to enhance student learning are imperative for higher education institutions and programs, as competence in writing and math directly influences student success and completion in higher education. As online learning continues to grow across colleges and universities, quality online support must be offered in order to meet the needs of online students.

However, there is a gap in the literature, and a gap in practice as well, regarding more extensive research on online tutoring services, including the relationship between usage and course success. It is necessary to evaluate the relationship between the usage of online tutoring

services and academic performance in online gateway courses, including reviewing the quantity of usage in relation to course success.

Purpose Statement

The purpose of this quantitative study was to determine the extent of the relationship between the use of an outsourced online tutoring system and course success in the USG online eCore gateway courses.

Research Questions

This study contained one primary research question which guided the study:

1. What is the probability of course success for students who used online tutoring?

In addition, the following secondary question was used to examine the quantity of usage to determine if increased usage has a significant relationship to student success:

2. For students who did use the online tutoring service, did a greater number of tutoring sessions and/or increased average length of tutoring sessions increase the probability of course success in online eCore gateway courses?

Significance of the Study

Understanding the implications of online tutoring usage and students' performance in online gateway courses can assist state and national initiatives in retention and graduation efforts. With limited studies on this topic, the purpose of this quantitative study was to investigate the relationship between students' use of the online tutoring services, as measured by the number of tutoring sessions they attended and the average time in tutoring sessions, and their academic success in online gateway courses over the course of two years, as measured by their final grades in these courses, which show whether the students were successful or unsuccessful. The outcomes of this study will be used to inform administrators of the implications of investing in

tutoring resources for online students. This is applicable and vital information to institutions across the University System of Georgia and beyond and can be instrumental in identifying resources to set students up for success in higher education.

The outcomes of the study will be shared with eCore stakeholders for further review on next steps. Although the eCore program offers the tutoring resource as a best practice service for learners, no research has been conducted to determine if a relationship exists between Tutor.com usage and course success in eCore gateway courses, and data may inform new ways to implement increased usage for students. Additionally, due to the lack of published research on the topic, outcomes could also be shared with the USG to potentially inform system initiatives and policies related to institutional tutoring services. While all USG institutions offer traditional tutoring in a face-to-face format, many USG institutions do not offer comprehensive online tutoring services for their online learners. This research may assist in the implementation of services which allow for easier access to tutoring for all students, regardless of their location and proximity to their institution.

Procedures

This section contains a brief overview of the research design used for this study, along with the population and sample, data collection, data analysis, and limitations. The study attempted to determine the extent of the relationship of online tutoring usage and course success for students enrolled in online USG eCore gateway courses. The outcomes of this study will inform administrators of the implications of investing in tutoring resources for online students.

Research Design

This was a non-experimental quantitative study utilizing statistical analysis of archival data. These data were collected and obtained from the USG Office of Research and Policy Analysis and the Tutor.com Administrative Portal and includes student grade data and tutoring

usage for students enrolled in English Composition I (ENGL 1101), English Composition II (ENGL 1102), Quantitative Reasoning (MATH 1001), Introduction to Math Modeling (MATH 1101), College Algebra (MATH 1111), Precalculus (MATH 1113), or Calculus I (MATH 1501) during the following six semesters: summer 2020, fall 2020, spring 2021, summer 2021, fall 2021, and spring 2022. Creswell (2014) notes that the quantitative approach should be utilized when seeking to understand the utility of specific interventions. For the purpose of this study, course success was measured by passing the course, as indicated by receiving a final grade of A, B, or C. Students who earned a final grade of I, D, or F and those who withdrew from the course were considered unsuccessful in the course.

Setting

Participants for this study were students from 21 University System of Georgia (USG) institutions who were enrolled in eCore ENGL 1101, ENGL 1102, MATH 1001, MATH 1101, MATH 1111, MATH 1113, or MATH 1501 during summer 2020, fall 2020, spring 2021, summer 2021, fall 2021, and spring 2022 semesters. During this timeframe, the students in the aforementioned courses were predominantly female students (62%). The largest race/ethnicity groups in this sample were White students (45%), followed by Black students (33%). The majority of students were classified as freshmen at 53%, followed by sophomores (18%).

Data Source

The researcher utilized archival data for this study. Prior to obtaining any data, the researcher sought and obtained approval from the Georgia Southern University Institutional Review Board (IRB). Once IRB approval was received, data were obtained from two sources - the Tutor.com administrative portal and the USG Office of Research and Policy Analysis. Three data collection points were utilized: final grade data for each identified gateway course for the

summer 2020 - spring 2022 terms, tutoring usage from the summer 2020 - spring 2022 terms, and demographic data for all students enrolled in these courses during the applicable terms. Demographic information provided included gender, race, and classification (dual enrolled, freshman, sophomore, junior, senior, graduate, or transient). The online tutoring usage data were obtained from the tutoring administrative portal by a member of the eCampus Administrative team, which provided a comprehensive student activity report, including the number of times each student accessed the service and in which subject area, along with the average length of each session. These usage data were then provided to the eCampus Data Analytics team. The eCampus Data Analytics team already had student demographic information and student grade data, obtained from the USG Office of Research and Policy Analysis for the purpose of compiling the annual factbook. All courses are graded on a letter scale of A, B, C, D, F, W, or I, and passing grades for these courses are A, B, or C. The eCampus Data Analytics team then compiled and synthesized these three data sets, de-identified all student information, and then provided this data set to the researcher.

Data Analysis

This study examined the extent of the relationship between the usage of an online academic tutoring service and course success (designated as passing or failing course) in USG eCore gateway courses. Each course was analyzed separately, and the online tutoring usage was assessed during the semester that students were enrolled in each identified course. Logistic regression was used to determine the probability of course success in USG eCore online gateway courses for students who used online tutoring services

Definition of Key Terms

The following key terms are identified for the purposes of this study:

Course Success - Course success is defined as obtaining a passing grade in the course. For this

      study, this includes grades of A, B, or C. (Gardner Institute, 2017)

Gateway Courses - Foundation level courses with typically high enrollment. Students are often at

      high-risk of not being successful in gateway courses. (Gardner Institute, 2017)

Outsourced Online Tutoring Service (OOTS) - An OOTS is an educational tutoring service

      provided by an outsourced company. (Miles et al., 2021)

Chapter Summary

With online learning programs growing across the country, online students must have relevant and quality services at their convenience. Understanding the extent of the relationship between the quantity of online tutoring usage and students' performance in online gateway courses can greatly assist state and national initiatives in retention and graduation efforts. Thus, the purpose of this study was to investigate the relationship between the use of an outsourced online tutoring system and course success in the USG online eCore gateway courses to determine the extent of the relationship between this usage and course success.

CHAPTER TWO

REVIEW OF THE LITERATURE

Considerable research has been conducted on college student engagement, online

learning, and the impact of tutoring on academic performance. However, research focused on

each of these topics in combination is scarce. A review of literature related to student success in

higher education, barriers to student success, and support services to address these barriers while

focusing on online learning is essential to set the stage for data review and analysis of the

relationship between online tutoring and student success in online core courses. Guided by

theoretical framework models, this literature review highlights the current landscape of student

success and engagement in higher education along with the resources intended to aid students in

their educational progression, setting the stage for reviewing the literature regarding these topics

in online settings.

Theoretical Framework

The current study utilized Tinto's (1975, 1987, 1993, 2012) Student Engagement Model

and Sanford's (1967) Theory of Challenge and Support as the central theoretical frameworks to

guide the foundation of the research. Both theories explore student engagement within higher

education along with critical components needed for college students to be successful in their

studies. Tinto's (1975, 1987, 1993, 2012) research focused on why students do not continue their

academic studies, and his research ultimately noted the need for a holistic experience for students

to stay engaged in their college experience to reduce the likelihood of dropping out prior to

college completion. Sanford (1967) also spoke of student engagement and the need for student

support, noting that there must be a balance between challenge and support. He theorized that if

students have too much support, they will not learn what they need to grow and develop; but if

they have too many challenges, they will likely become frustrated and may not persist to successful completion (Sanford, 1967). Drawing from the intersection of these two theories, student engagement and a healthy balance of student support are critical for student success in higher education. While traditional student engagement largely involves face-to-face interactions, with the rise and expansion of online learning, student engagement in an online setting is not only possible, but increasingly common.

Tinto's Student Engagement Model

While higher education enrollments continue to decline across the United States as costs increase, student retention, success, and college completion are more important to higher education institutions now than ever before. Because of this, institutions must employ methods to both recruit new students and retain existing students. While student success in higher education is multifaceted, Tinto's (1975, 1987, 1993, 2012) Student Engagement Model highlights two factors which are supremely important in determining college success - student involvement and student engagement. Tinto noted that the more involved a college student is, the more engaged and persistent they will be in their college experience (1975). Tinto's research centers on why students leave their academic studies, and it ultimately focuses on the need for a holistic experience for students to become, and remain, engaged in their college education and experience to reduce the likelihood of dropping out prior to completion. Tinto claimed that positive student outcomes are largely due to student involvement and engagement across students' higher education experience. He noted that "other things being equal, the higher the degree of integration of the individual into the college, the greater will be his/her commitment to the specific institution and the goal of college completion" (Tinto, 1975, p. 96). Using Tinto's Student Engagement Model as one of the two theoretical frameworks for this study may help to

inform the relationship between online academic tutoring and student success in gateway courses.

Since 1975, Tinto has been a leading researcher and theorist on why students leave college prior to completing their education. While his research is referenced by name in various ways, including a model of student departure, a model of student integration, and a theory of student retention, Tinto strongly focused on the need for student engagement in both the academic and the social realms. His research is foundational to student persistence studies, and it is generally accepted that Tinto's theory is one of the most highly developed and utilized models of student retention in higher education. Pascarella and Terenzini (2005) noted that Tinto's theory is likely the most utilized framework in examining linkages between students and their college experience.

Tinto's research focuses on a holistic approach to the college student's academic career. He expressed the importance of students' involvement and engagement in their environment— not only academically, but also socially. His seminal work was his 1975 article "Dropout from Higher Education: A Theoretical Synthesis of Recent Research" which served as his initial theoretical base in explaining why some students drop out of college while others successfully persist. Tinto focused on academic and social integration of students within the institutional environment and attempted to explain how the interactions between students and their institution lead to either continuation or dropping out, attributing the notion of integration within an institution as the main contributing factor in reducing student dropouts. Tinto acknowledged that students arrive at college with varying personal and demographic characteristics (such as academic ability and gender) as well as varying pre-college experiences (such as high school preparation and student profile). Tinto noted that all these factors influence student retention,

commitment to the institution, and the goal of degree attainment. Further, he posited that while social integration resulted in increased commitment to the institution, academic integration resulted in increased commitment to the goal of degree attainment. Tinto concluded that the combined effect of the increased commitment to the institution and to the goal of degree attainment was a driving factor in student persistence and retention.

The first edition of Tinto's book, *Leaving College, Rethinking the Causes and Cures of Student Attrition* (1987) added research relating to a transition period which should occur in college for students to successfully transition and integrate into their new environment in order to be successful. Tinto put the call to action on institutions and offered action items which institutions should take in order to assist with this transition process for their students. These include both academic and social opportunities/resources, such as ensuring students have the opportunity to acquire skills needed for academic success and making contacts with students beyond solely academic purposes (Tinto, 1987).

In 1993, Tinto updated, expanded, and added to his theory in the second edition of his book, *Leaving College, Rethinking the Causes and Cures of Student Attrition*. Some of the new research focused on addressing wider ranges of students, including students of color and nontraditional students. He also noted the importance of classroom engagement for some of these newly identified student groups, such as commuter students, who may not get to experience the full engagement aspect of an institution due to their enrollment situation.

Finally, Tinto's most recent book was published in 2012: *Completing College*. The focus of this new publication was largely on actionable items which institutions should consider implementing in order to help student persistence and completion. Again, Tinto's aim was to assist institutions in implementing strategies and plans to promote student retention and success,

for a variety of students. Figure 1 presents the multiple factors Tinto (1993, p. 114) contributed to a college student's possibility of academic success.

Figure 1

Tinto's Institutional Departure Model
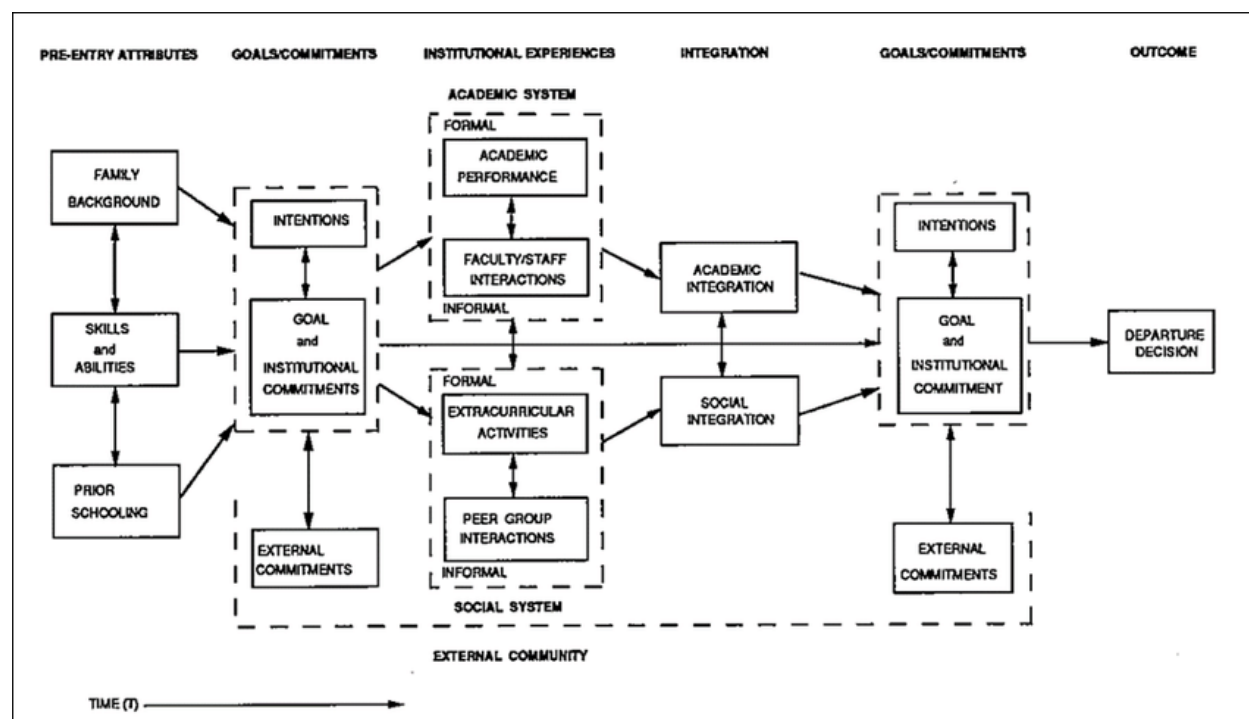
While Tinto's later research (1993) did include additions for nontraditional and commuter students, he has never substantially addressed online learning or this population of learners. However, many of his ideas regarding nontraditional and commuter students are applicable and relevant to online learners as well. Karp et al. (2010) explored Tinto's theory for community college students and found that although social integration was considered unlikely for this population of students, social engagement and interaction was indeed prevalent for students at community colleges. Karp et al. found that the networks which promote student integration are developed within classroom academic structures. Like nontraditional and commuter students, online learners have the opportunity to become engaged in their academics,

as well as become engaged socially with their peers and institution. Although this may look different than traditional, on-campus students, Tinto's theory and frameworks can continue to be relevant to this type of learner.

The notion of higher education engagement is complex and includes academic engagement both inside and outside of the classroom, regardless of the learning modality (face-to-face or online). Research shows that when students display help-seeking behaviors, they are more likely to be academically successful (Shoulders et al., 2020). Further, if students begin their college career with engagement behaviors, they are more likely to continue to be engaged as they progress through their course(s) of study (Tani et al., 2021). Due to the positive impact and likelihood of the continuation of early engagement, it is crucial for students beginning their higher education journey to become engaged in their college, ideally in both academic and social environments.

While Tinto's model does include various components which affect a student's retention in higher education, he emphasizes the importance of both academic and social engagement. Although tutoring is primarily viewed as academic engagement, it is also a form of social engagement. By design, both asynchronous and synchronous tutoring require interaction with others, even though they are academically-based. Therefore, academic and social engagement are present during tutoring due to the nature of interaction between two or more individuals, providing a meaningful engagement opportunity for college students.

Sanford's Theory of Challenge and Support

Nevitt Sanford's foundational theory stressed the importance of an appropriate balance of challenge and support for college students. The researcher theorized that students need an educational environment which provides enough challenge and complexity to be engaging, while

providing enough support to mitigate anxiety for the student (Sanford, 1967). Too much

challenge may cause the student to retreat, while too much support may result in a failure for the

student to appropriately develop. Sanford (1967) suggested that college environments which are

likely to cultivate student success are those which promote opportunities to find support and

engage challenges for students. While students will inevitably encounter academic challenges in

their higher education studies, Sanford noted the importance of supporting them along their

journey, with the reinforcement of support services available to them. This appropriate balance

promotes crucial engagement which is critical for student success. Figure 2 depicts the levels of

challenge and support which, depending on the level of each, can either facilitate or debilitate

growth.

Figure 2

Sanford's Theory of Challenge and Support
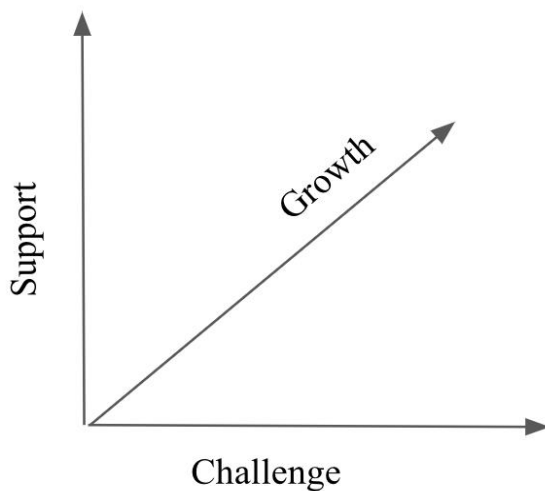
As Figure 2 shows, a student's growth is contingent on both support and challenge, and as

these essential components grow, so does a student's chance of success. Sanford's (1967) book

Where Colleges Fail: A Study of the Student as a Person places a large responsibility on colleges

to develop structures which meet their students' needs. While the academic courses should present the challenge aspect of the model, the student support resources should rise to meet the level of the challenge. While this can be in the form of the instruction itself and/or instructor, it may also be via external support structures offered by the institution. Further, Sanford presented a third factor that affects student growth—readiness. The researcher noted that students must be developmentally ready to grow and progress, and that this readiness factor is internal. While robust and helpful support structures may be available to the student, the student must be willing to seek these resources out and/or accept them, whether these services are offered face-to-face or online.

Support services for online students are on the rise as online learning grows as a higher education modality. While on-ground student services for college students were previously the norm, many institutions have pivoted to expand these services in online formats. However, students must often self-direct their own access to these typically voluntary resources (Broadbent & Lodge, 2021). Faculty often do not encourage students to pursue support services although studies show that utilizing support services in online environments can positively impact student retention (Russo-Gleicher, 2013). In a study which researched help-seeking behaviors in online learning environments versus blending learning, Broadbent and Lodge (2021) noted that live online support is well received by online learners and was found to be successful in assisting students both academically and personally.

Sanford's theory emphasizes the importance of support services to meet the academic challenges that college students may face, and online tutoring is vital in this regard. With strong academic support, online students are more likely to persevere even in light of challenging academic circumstances. While Tinto (1993) and Sanford's (1967) theories reinforce the need

for student engagement and support as a necessity for success and research shows that help-seeking behavior leads to student engagement, barriers in the online environment exist. Institutions must address and mitigate these barriers and ensure that online learners have access to be as engaged and supported as students who are learning in a face-to-face setting. This includes the implementation and evaluation of quality online academic resources, including online tutoring.

Student Success in Higher Education

As enrollment and retention rates continue to decline across many colleges and universities in the United States, attention to the decreasing numbers is escalating. Currently, the national six-year graduation rate for students who started at four-year public institutions is 69%, with Georgia coming in at six percentage points below the national average at 62.9% (Causey et al., 2022). In an effort to increase student retention, progression, and graduation (RPG), national and state measures have been implemented to mitigate declines in these areas of student success. These initiatives include Complete College America (CCA) and Complete College Georgia (CCG). Both CCA and CCG have a shared vision - to leverage resources and promote policies that will close equity gaps while increasing college completion rates (Complete College America, n.d). One focus in the state of Georgia is concentrated efforts in the area of gateway courses.

Gateway Courses in Georgia

The state of Georgia has focused on gateway courses under the CCG initiative, along with various other support initiatives in the University System of Georgia (USG) (Complete College Georgia, n.d.). Gateway courses are foundation level courses which are necessary for students to progress through their degree pathway. These courses typically have high enrollment

and students are often at high-risk of not being successful in gateway courses (Gardner Institute, 2017). In Georgia, three crucial gateway courses comprise the first area of a student's core curriculum (Core Curriculum Area A) and include English Composition I, English Composition II, and an introductory mathematics course. These courses are viewed as critical components in a student's freshman year, as they have the potential to affect their entire collegiate career (Complete College Georgia, n.d.) since students must successfully progress through these gateway courses in order to obtain a college degree. Denley (2017) studied 10,000 USG students and discovered that students who successfully completed all three gateway courses in the first year of college had a six-year graduation rate of 66%, while those who did not successfully complete all three gateway courses in the first year had a six-year graduation rate of 6%. These data follow a pattern of comparable research completed, which indicated that students gain momentum when completing a full load of courses, including gateway courses, during their freshman year (Belfield et al., 2016). Bloemer et al. (2018) found that poor performance in gateway courses contributes greatly to attrition. While a common prior practice to ensure that students had ample support in these high-stakes courses was enrollment in pre-requisite remediation courses, more recent research found that integrated support systems better prepare students to succeed in these crucial courses (Scott-Clayton et al., 2014). Prior models required students to take zero-credit hour courses before the actual credit-bearing course, however, the USG has now implemented current research-driven models where academic support systems are integrated into the course curriculum itself, either through a co-requisite model or integration of other academic support services within the course (Complete College Georgia, n.d.).

The importance of student success in fundamental writing is crucial, with English composition courses serving as two of the three gateway courses in Georgia. These two general

education courses (English Composition I and II) are taken in a sequence and are designed to focus on skills required for effective reading comprehension and writing in a variety of contexts. The remaining gateway course is an introductory mathematics course. There are various options of introductory mathematics courses that students can complete to fulfill this requirement, with the goal of building a strong foundation in mathematical concepts, processes, and structure. While each of these three courses are crucial to a student's degree progression, there are several obstacles that students may face when attempting gateway courses in college. Further, these obstacles may increase when students attempt these courses online.

Koch and Pistilli (2015) found that both introductory mathematics courses and English courses were among the lowest in success rates for high enrollment courses at four- year institutions in the United States. College level mathematics courses had a Drop, Fail, Withdrawal, Incomplete (DFWI) rate of 38%, while college level English courses had a DFWI rate of 21%. With the high-stakes nature of these courses, it is imperative that students have the highest chance of success possible, despite potential barriers, in order to successfully matriculate through their educational pathway.

Barriers to Student Success

Many students are entering college underprepared for their college coursework. College preparation is a vital indicator of predicting college student success, and research shows that college readiness (or lack thereof) is an important component in determining students' educational success or unsuccess (Pike et al., 2014). Pike et al. (2014) noted that college readiness factors such as demographic data, standardized test scores for admission into college, class percentile rank, and intensity of high school coursework are significantly related to four-year and six-year degree attainment. This finding follows a pattern of other research which has

linked high school performance and student profile to success in college (Anderton et al., 2017).

Differences in success, retention, and degree completion rates at higher education institutions are

often attributed to differences in characteristics and profiles of enrolled students (DeAngelo et

al., 2011). Further, the researchers found that students with higher high school grades and

standardized testing scores are more likely to complete college than students with lower high

school grades and scores. Atuahene and Russell (2016) noted that mathematics college readiness

for graduating high school students differ across gender and admission groups. Currently,

institutions attempt to assess potential for student success by scoring incoming students based on

readiness measures such as the student's GPA, their standardized scores such as the SAT or

ACT, and their high school class percentile rank. Institutions typically use these to make an

admission decision into the institution, a placement decision, or both. However, while these

formulaic indicators give institutions some type of insight into the probability of future student

success, they are not comprehensive of a student's readiness or potential. Students are more

likely to experience challenges in their college progression if their high school experiences do

not prepare them for college-level coursework.

When students arrive at college underprepared, robust support services can be a lifeline to

assist them in academic remediation. However, a common barrier to student success is a lack of

sufficient student resources at the institution of attendance (Millea et al., 2018). Millea et al.

(2018) found that institutional programming can have a substantial effect on student success.

Higher education institutions typically boast services to include tutoring, counseling, advising,

academic interventions, and library resources. However, these services can vary greatly amongst

institutions, as those who are smaller in size and budget may lack student resources often found

at larger, more robust institutions due to the institution's financial makeup. Millea et al. (2018)

also found that institutional spending on student resources can have a significant impact on student outcomes. Webber and Ehrenberg (2010) noted that non-instructional spending, on services such as student support and retention services, positively influence retention and graduation rates. This is especially true for institutions with lower entrance test score requirements, as those students were able to receive remediation to compensate for their possible lack of readiness. The researchers suggested that institutions consider reallocating funds from instruction to student services at institutions that fail to meet national standards of retention and graduation (Webber & Ehrenberg, 2010). Atuahene and Russell (2016) urged higher education institutions to address academic barriers and concerns by providing adequate support services for underprepared students, as their research found that math skill deficiency remains a national concern. Students are more likely to either withdraw or fail their introductory gateway courses when they are not adequately prepared to succeed in the higher education environment. As a result, this directly impedes their ability to successfully progress through the remainder of their educational trajectory.

Traditional Institutional Academic Resources

Higher education institutions typically retain a standard set of student support resources to aid students in overcoming barriers to their learning. These resources are designed to support students outside of their academic instruction, and many services are geared toward beginning students. Academic tutoring is one of the most widespread student services available for college students. Institutions may offer tutoring in a variety of arrangements, including institutional staff/faculty tutoring, peer tutoring, and writing labs. Typically, students seek tutoring on their own, since most courses or programs do not require supplemental instruction or remediation. Therefore, students not only must be aware of their own need for assistance and where to obtain

this assistance, but they must also possess the motivation to actually seek out the service needed. Unfortunately, many university students are not aware of the student services available to them at their institutions, including tutoring resources (Perry et al., 2020).

Student Writing Centers

Student writing centers are a common fixture on most college campuses and are perhaps the most widely known tutoring resource, with almost 100% of college campuses in the United States offering writing centers (National Census of Writing, 2017). Established writing centers began in the early nineteenth century and were more commonly known as writing labs (Boquet, 1999). This service focused mainly on "fixing" students' writing, however, by the 1950s, the model shifted from simply finding and fixing errors in students' writing to communicating and working through the writing process with the student (Boquet, 1999). Writing centers increased across universities, and Salem (2016) claims that this resource has persisted due to various factors, including the knowledge economy demand. With academic and/or proficient writing skills needed in almost all college courses, as well as in most professions, the need for a resource which focuses solely on the skills and improvement of writing skills is bound to persist indefinitely.

Several researchers have demonstrated a relationship between higher education academic writing centers and academic achievement. Wingate (2010) noted that students were more apt to utilize writing assistance when receiving formative feedback from tutors. Further, when students acted upon that formative feedback, they improved in the areas previously criticized (Wingate, 2010). Colver and Fry (2015) conducted a study which found a causal relationship between tutoring and final course grades, and they also noted that tutoring was particularly beneficial for first-generation college students. Not only has research shown a

relationship between the use of tutoring via writing centers and academic achievement, some studies have also shown that the frequency of writing center usage can contribute to student course success. In a four-year study of the frequency of freshman composition students' utilization of a university writing center, Williams et al. (2006) found that the more frequently the students visited the writing center, the better their final composition grades. Similarly, Williams and Takaku (2011) performed an eight-year study that also found that high levels of writing center visits in college students resulted in better performance in composition classes, even amongst students for whom English was their second language. Their study showed that with adequate assistance from their university writing center, even students who may have more limited English proficiency could make compelling improvements in acquiring academic writing skills (Williams & Takaku, 2011). Pfrenger et al. (2017) analyzed 1000 college students' test scores, course outcomes, and frequency of university writing center visits and determined that students who participated in more frequent writing center visits were more likely to obtain higher grades than those who did not frequently obtain writing assistance. Another study which analyzed students' usage of writing center assistance in composition courses found that more than two visits are needed to positively and significantly contribute to students' course grades, but that four or five visits are preferable in regard to student grades (Rendleman et al., 2019). Therefore, the literature suggests that although obtaining assistance from university writing centers does positively contribute to student writing outcomes, the frequency of using the service is also an important factor.

STEM Tutoring

In addition to writing centers on campuses, institutions typically also offer tutoring in general Science, Technology, Engineering, and Mathematics (STEM) courses. Although the

structure of the tutoring programs may differ amongst higher education institutions, most of the general tutoring programs provide a peer tutoring model which consists of other students (undergraduate and/or graduate students) who provide the tutoring assistance. Peer tutoring has traceable origins as far back as the ancient Greeks, but previous literature on peer tutoring in higher education only began as recently as the 1970s (Topping, 1996). Newton and Ender (2010) described the peer tutoring model as beneficial to campuses for a variety of reasons, including being cost effective, relatable relationships between tutors and tutees, and overall effectiveness on academic performance.

Studies show that STEM tutoring is ultimately beneficial to student retention and performance. Cooper (2010) examined a tutoring center which focused on general university requirements, such as mathematics and science, and found that freshmen students at a university who received tutoring from the tutoring center more than ten times in a quarter during their first year had positive results. Those students had higher rates of persistence and were more likely to be in good academic standing than students who did not visit the tutoring center. Additionally, freshmen students who obtained assistance from the tutoring center at least once during their first year were still more likely to persist than students who did not visit the center, however, their rate of good standing was not as significantly higher as the students who pursued more tutoring (Cooper, 2010). Xu et al. (2001) determined that tutorial assistance had a significant effect on students' final examination scores in a mathematics course taken at the University of Arizona, independent of the variables of gender, SAT score, math placement level, and high school GPA. Further, DeFeo et al. (2017) found that students' help-seeking behaviors in mathematics courses ultimately benefited their academic performance. While most institutions offer these traditional methods of tutoring to students in a face-to-face format, online tutoring is also becoming more

prevalent due to the increasing percentage of distance learners. With online learning on a steady rise across the world, this mode of instruction and learning has become an integral part of higher education.

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Online Learning

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Online learning, though increasingly popular amongst students in higher education, is not a new phenomenon. Distance learning originated in the late 1800s with correspondence learning, which enabled learners and teachers to communicate via postal mail at a distance (Kentnor, 2015). Distance learning then evolved into also using radio and television until the late 1990s, when technological advances enabled digital learning (Kentnor, 2015). Online learning, as the world knows it now, involves two-way communication using the internet, through both synchronous and asynchronous modes. A primary benefit of online learning is access, as online learning provides educational access to learners who otherwise would not have the ability to obtain education (Bawa, 2016), including adults, working professionals, and individuals with familial obligations which would otherwise prohibit them from attending classes in a face-to-face format. These learners are referred to as non-traditional, as traditional learners are viewed as those who are coming into college immediately following high school graduation (Zamecnik et al., 2022). While these non-traditional learners continue to often take online courses in higher education, traditional students are taking more online courses at a rapid rate, and even more so following the COVID-19 pandemic.

Growth of Online Learning Due to COVID-19

In the spring of 2020, the coronavirus pandemic began to disrupt and change education across the world as most institutions transitioned to solely online courses for at least one semester. By fall 2020, 75% of all undergraduate students in the United States were enrolled in at

least one fully online course, while 44% of undergraduate students exclusively enrolled in a fully online schedule (NCES, 2022). Prior to the pandemic, in fall 2019, 6 million students were enrolled in at least one online course. By fall 2020, this number rose to 11.8 million students, an increase of 97% (NCES, 2022). Further, the number of undergraduate students who exclusively enrolled in online courses was 186% higher in 2020 than in 2019 (NCES, 2022). With this substantial increase in online learning, many groups of students who had not previously taken online courses were beginning to become accustomed to the online environment. This "trial by fire" demonstrated that students continued with online learning, even after courses began to be offered in a face-to-face setting.

Online learning has a myriad of benefits for students, with access to education as the most widely recognized advantage. With the flexibility and convenience which online learning affords, it has grown increasingly attractive to students as an alternative way to earn education (Politis & Politis, 2016). For students who do not live near a higher education institution, online learning offers an educational opportunity which may not have previously existed. Additionally, the cost associated with online courses also factors into student choice. As institutions have streamlined procedures and reduced challenges related to offering courses online, cost for online courses is typically on par with face-to-face courses (Castro & Tumibay, 2021). Reducing the need for transportation costs as well as time saved without a commute to the physical institution allows learners to plan their coursework on their own time, giving more flexibility with regard to employment and family obligations.

While online learning was previously viewed as inferior to face-to-face learning due to empirical evidence from the past decade which shows a lower retention rate for online courses (Hachey et al., 2022), online learning technologies continue to improve. As more data are

available regarding online learning, higher education administrators have reason to remain optimistic regarding the opportunities of online learning due to the number of students which can be served exclusively online. After years of online learning growth and expansion, the COVID-19 pandemic finally solidified online education as not only an alternative form of instruction, but an essential form of instruction in higher education. As technologies continue to advance, and students arrive at college with the necessary technological skills to fully utilize online learning, online learning continues to be a viable tool for education.

Online Learning Technology

As technology has grown and expanded in new and innovative ways, online learning has followed suit. Higher education online learning now attempts to harness new technologies to enhance learning in ways to engage learners and create interactive environments (Cavus et al., 2022). Colleges and universities employ Learning Management Systems (LMS) to provide a comprehensive online classroom which promotes collaborative learning amongst learners (Bradley, 2021). Watson and Watson (2007) defined an LMS in its simplest form as a platform to distribute and administer pedagogical material. A standard LMS contains such tools as discussion boards, email, calendars, and course content organizers, along with the distribution and submission of quizzes and assignments (Cavus et al., 2022). While a LMS sets up the online classroom to seamlessly engage asynchronous learning, they may also integrate and support synchronous components into the course, such as video conferencing or live chat. This blended learning environment (both synchronous and asynchronous components) can set students up for success by providing the flexibility which asynchronous learning cultivates, along with the instant support and feedback which synchronous learning fosters (Alzahrani, 2019). In a study conducted by Alzahrani (2019), the researcher found that students in a blended online

environment performed significantly better than students who were solely in an asynchronous online environment.

While there are various LMS platforms utilized by institutions of higher education across the country, the LMS represented in this study is Brightspace. Brightspace is a cloud-based learning platform which is used extensively in education, from K12 schools to universities (D2L, 2023). The Brightspace platform's aim is to create evolved, personalized learning at scale through their technology, which houses the ability to create blended learning environments to meet the needs of the educational entity. In a study which compared Brightspace to Google Classroom in higher education, Francom et al. (2021) found that users of the systems indicated a general preference for Brightspace due to its usability and productivity tools. The USG's Information Technology Services (ITS) Department oversees the collaborative Brightspace LMS explored in this study, which is called Georgia Online Virtual Instruction Enterprise Wide (GoVIEW). While each institution in the USG retains their own institutional instance of Brightspace, because the courses in this study are collaborative across the system, GoVIEW houses the multi-institutional delivery of the courses.

Online Delivery of Collaborative Core Curriculum

The University System of Georgia retains a unique model of leveraging resources to operate select online programs through a collaborative statewide approach. While higher education institutions typically determine their own course and program modalities based on demand, availability, and fiscal considerations, the USG offers various degree programs and courses across its public institutions, to be delivered and taken in a collaborative manner. The largest of these programs is USG eCore, a collaborative set of online core curriculum courses in the University System of Georgia, which delivers the courses across 21 public universities and

colleges in the state (eCore Factbook, 2021). USG eCore's mission is to provide USG students an affordable and accessible way to take core curriculum courses in a fully online environment regardless of their location (eCore Factbook, 2021). The program has had substantial growth from its inception, and in the last ten years, eCore enrollment has grown by almost 900%, from 5,061 unduplicated enrollments in 2011 to 49,105 unduplicated enrollments in 2021 (eCore Factbook, 2021). In a study which analyzed USG eCore enrollments as they pertain to student retention and completion, Lee and Combes (2020) found that USG eCore has achieved the goal of helping students affordably take their first two years of college online. They also found that students who took one or more eCore courses enroll in more semesters than those who do not enroll in eCore courses, and that associate-seeking students who enrolled in eCore courses were more likely to graduate and took on fewer loans on average. Some of the factors that Lee and Combs (2020) attribute to the success of USG eCore include regularly updated courses and faculty expertise. While USG eCore is meeting enrollment and retention goals along with providing high-quality instruction, the program must also ensure that adequate student support services are available and helpful to its online learners.

Barriers to Online Student Success

While online learners often face many of the same barriers as face-to-face learners, they may also have additional obstacles. One barrier particularly relevant to online learners is technology difficulties. Due to the nature of online learning, students must retain both technological savviness as well as reliable hardware and software. Gonzalez-Ramirez et al. (2021) found that students who transitioned from traditional in-person learning to online learning at a private college during the COVID-19 pandemic cited reliable Wi-Fi as their top barrier to online success. While online learning assumes that students have necessary equipment and

connections, this is not always the case. Instead, due to seat availability, health emergencies, or an alternate work schedule, students may change to online learning suddenly, without the skills, motivation, or equipment to be successful. In a systematic literature review focused on retention in higher education, Seery et al. (2021) found that technological factors were one of the top five themes which contributed to low retention rates in online learning, further noting that students often encounter challenges and withdraw from online courses if they are not technically savvy or possess the technical elements which are needed to be successful in the online environment.

Other key barriers to online student success include the motivation to be a self-directed learner and the ability to practice effective time management skills. Hampton and Pearce (2016) noted that being focused and engaged in academic coursework as an online student is crucial for success, and Boton and Gregory (2015) noted that motivation is an essential element for online learners. Bawa (2016) added that the lack of motivation can result in low retention rates for online classes since they tend to rely on students' self-direction. However, college students often struggle with skills such as self-regulating and self-pacing in the online environment (Kocdar et al., 2018). Although learners who display high levels of self-regulation have been associated with higher academic performance and persistence (Broadbent & Poon, 2015), self-regulation can be even more difficult to achieve in an online environment than a traditional face-to-face environment. Students may also become overwhelmed by the perceived high cognitive load of online courses (Bawa, 2016).

College students also often struggle to advocate for themselves and seek help when needed. Help-seeking behavior is a proactive strategy and skill which requires that learners must know when, how, and from whom to seek help. While literature shows that academic help-seeking does have a significant and positive impact on student achievement (Fong et al., 2021),

students may not have cultivated this skill, especially early in their higher education career. Although colleges continue to refine and promote their academic support services, ultimately, the student must seek out and utilize these resources on their own. However, college students tend not to seek out these services (Zusho et al., 2007). Although online learning increases access to higher education and fits the needs of various types of learners across the country, there continue to be barriers which institutions must mitigate to promote student success. Institutions must provide their online learners with adequate online resources to meet their needs, with online tutoring being a crucial resource for these learners.

Online Tutoring

Online learning is no longer viewed as a secondary form of higher education, as research has demonstrated that digital learning allows institutions to progress in various ways, including improved student outcomes and increased access (Bailey et al., 2018). As colleges and universities rapidly add online courses and programs to their institutional offerings, institutions must also add relevant resources for their new and existing distance learners. Dollinger et al. (2020) noted that it is imperative for higher education administrators to explore and evaluate suitable online student support services to further assist online learners, especially those identified as being 'at risk.' Seery et al. (2021) found that student success support was one of the six most common retention strategies for online students, and they note that student success resources must be available if institutions desire for online learners to be successful. Since enrollment in online courses has steadily increased at a higher rate than on-campus courses (Britto & Rush, 2013), institutions must provide equal services to these online learners, including tutoring.

History of Online Tutoring

While online tutoring in higher education began using face-to-face tutoring in the late 1980's (Hanham et al., 2021), in recent years there has been a rapid expansion of online tutoring services (Zhang & Bray, 2020). Hanham et al. (2021) noted that online tutoring is advantageous to both students and institutions due to being more affordable and convenient than face-to-face tutoring. Where students previously had to visit a physical location on campus to access writing centers or tutoring centers, technological advancements have instead brought the tutoring to the students. Tutoring centers ventured into online spaces to offer support for online students (de Jong, et al., 2017; Rennar-Potacco et al., 2017). Writing centers began offering online services to students, both via synchronous methods such as phone and instant messaging chat support, and asynchronous support, such as email correspondence and feedback on students' essays through comments (Moberg, 2010). Beginning in the 2010s, online tutoring began to grow rapidly, revealed by the rise of tutoring businesses like Net-Tutor, Tutor.com, SmartThinking, and others (Smith, 2018). A benefit of these online tutoring companies to higher education institutions is the 24-7 nature of the services, as well as the extended subject coverage that the companies were able to provide. Although expanding student services to include online support does require a financial investment, Montelongo (2019) noted that this expense is justified due to equality, accessibility, and student outcomes. Unlike traditional face-to-face tutoring services offered on campuses, one distinct benefit of online tutoring is the flexibility of the service. Dollinger et al. (2020) found that a significant proportion of students at a large research-intensive university accessed their online tutoring options outside of standard business hours. Studies have noted that students were equally satisfied with campus-based and online tutoring (Wolfe & Griffin, 2012),

while other studies determined that students preferred strategies used in online tutoring sessions compared to campus-based sessions (de Jong et al., 2017).

Impact of Online Tutoring on Student Performance

Like traditional tutoring, online tutoring has also been shown to improve student performance (Richardson, 2009; Riley, 2019; Roberts & Goss, 2009). Online tutoring methodologies attempt to mimic face-to-face interactions, with increased attention and research on the effects of different types of questioning and correspondence in online tutoring sessions (Hrastinski et al., 2021). Richardson (2009) found no significant difference between students utilizing face-to-face tutoring services and students utilizing online tutoring services. Further, Riley (2019) found a significant correlation between online tutorials and scholarly scores for students. One study which explored the usage of an online writing tutoring service found that online feedback from the service greatly improved students' writing performance (Beccaria et al., 2019). Rennar-Potacco et al. (2017) found that online academic support for low-retention STEM courses at a four-year college in the northeast had positive results, both academically as well as socially. A study which focused on the relationship between the quantity of online tutoring and course success in composition courses in a University System of Georgia online program suggested that students who utilized writing support through online tutoring are more likely to pass the course than those who did not (Miles et al., 2021). Further, those who used the service three or more times passed their respective course at a higher rate compared with those who utilized the service once or twice.

Impact on Online Tutoring on Student Motivation and Perception

Research has also shown that the utilization of online tutoring services has positive implications on students' self-perception of their academic performance, along with their actual

academic performance. Ashford-Rowe and Howarth (2011) reported that students who utilized an online tutoring service at a university over the course of two semesters perceived the service to make a difference in their overall academic performance, with 85% of students noting that using the online tutoring service made some positive difference to their overall performance. Dollinger et al. (2020) found that the majority of students at a large research-intensive university in Australia who utilized an online tutoring platform indicated that they were either satisfied or extremely satisfied with the synchronous and asynchronous services. Students also agreed or strongly agreed that the support provided may help them to earn a higher grade in the course, be more confident in their learning, and increase their likelihood of remaining at the institution (Dollinger et al., 2020). Hanham et al. (2021) studied the usage of a large online tutoring platform at an Australian university, surveying students who utilized this service. They found that students' perceptions of the usefulness of the tutoring service were associated with their perceptions of their academic capabilities. In turn, their own self-efficacy was associated with their academic achievement outcomes. The literature supports the idea that online tutoring has been shown to increase students' self-efficacy, in turn, contributing to their academic success.

Tutor.com Online Tutoring Service

While there are various online tutoring services designed to serve the needs of college students, the outsourced online tutoring service explored in this research study is Tutor.com. The study focused on tutoring which occurred either synchronously or by receiving direct feedback on an assignment from a tutor in a brief turnaround time. This type of tutoring has been described as person-to-person online tutoring (Johns & Mills, 2021). Dollinger et al. (2020) found that third-party online support services are useful to college students and may serve an important role for all students, regardless of their location or study load.

Tutor.com is a leading Outsourced Online Tutoring Service amongst educational institutions, from K12 to colleges, universities, and public and state libraries. With coverage in more than 200 subject areas (Tutor.com, 2020), many colleges and universities in the country rely on Tutor.com to provide comprehensive online tutoring coverage for their online learners. Students have the ability to choose the methodology in which they receive assistance including scheduling a future one-on-one appointment with a tutor, dropping in for a live session with a tutor, submitting a question for asynchronous assistance, or submitting their writing for review, critique, and a focused revision plan within 24 hours. Tutor.com delivers flexible options to meet students' needs, and they reinforce the qualifications of their tutors: applicants must demonstrate their subject-matter expertise, effective tutoring methodology, mastery of the online environment, and understanding of Tutor.com's pedagogy and policies (Tutor.com, 2020). For the purposes of this research study, Tutor.com's writing and mathematics support were the focus. The service provides intensive support for writing, including the general Essay Center where students submit their writing for detailed feedback and revision plans, general grammar and documentation review, research and documentation assistance, paragraph submission, and live reading and writing assistance from a tutor. Tutor.com also focuses on intensive mathematics support, offering coverage in all USG gateway mathematics courses in a variety of modes.

As one of the academic support services for students enrolled in USG eCore courses, Tutor.com is a free option for students to seek assistance with their studies. The tutoring platform is directly linked in their course(s) on the course navigation bar. Once students are on the tutoring platform, they have four options: connect with a tutor now, schedule a tutoring session, submit a paper for review, or drop off a math question. Depending on the option selected by students, they receive either synchronous or asynchronous support from qualified tutors in the

subject area. For synchronous sessions, students connect with a tutor for up to one hour per session. For asynchronous support, students submit their writing or math questions and receive feedback up to 24 hours later. While the use of the service is voluntary, USG eCore faculty and student support staff do encourage students to utilize the service through various means, including email and phone call reminders, as well as announcements within the course itself.

While many studies show that tutoring is beneficial to both students' academic performance and self-perception, research which evaluates the relationship between the amount of usage of online tutoring and student performance in online courses is limited. Many studies have explored online tutoring and academic achievement but did not address frequency of usage as a factor. This study explored the frequency of usage in an attempt to bridge the gap in the literature regarding the relationship between online tutoring services and course success in online gateway courses.

Chapter Summary

The objective of this literature review was to examine and synthesize existing research related to student success in higher education, barriers to student success, and support services to address these barriers while focusing specifically on online learning. Tinto's (1993) Student Engagement Model and Sanford's (1967) Theory of Challenge and Support were the foundational models used to guide this literature review and set the stage for current research relating to the relationship between online tutoring and student success in online core courses. Although limited, research completed on online tutoring does show an existing positive relationship between online tutoring and academic success (Beccaria et al., 2019; Richardson, 2009; Riley, 2019; Roberts & Goss, 2009). Since research on the relationship between the use of online tutoring and online introductory gateway courses is limited, this study intends to add to

the literature in order to advance the availability of online tutoring resources for online students

at institutions of higher education.

CHAPTER THREE

METHODOLOGY

The use of academic tutoring as a student resource in higher education is a standard practice amongst institutions, as research shows that tutoring contributes positively to both students' confidence as well as their academic performance (Arco-Tirado et al., 2019; Williams & Takaku, 2011; Wingate, 2010). While research which specifically studies online tutoring is sparser than research addressing face-to-face tutoring, the existing literature shows that tutoring delivered online can be as effective as face-to-face tutoring (Richardson, 2009) and that online tutoring is an effective strategy to improve student course outcomes (Riley, 2019). However, the literature lacks more extensive research on online tutoring, including the relationship between degree of usage of this resource and course success. It is essential to understand the benefits of online tutoring systems to students enrolled in online courses. With online learning programs continuing to grow across the country, online students must have relevant and quality services at their convenience. Understanding the relationship between online tutoring usage and students' performance in online gateway courses can greatly assist state and national initiatives in retention and graduation efforts.

The purpose of this quantitative study was to investigate the relationship between the use of an online tutoring service and course success in the USG online eCore gateway English Composition and Mathematics courses to determine if utilizing online tutoring increases the probability of course success. Additional variables that were explored in this study include the number of tutoring sessions utilized by students as well as the average length of the tutoring sessions. Data for this study were obtained from the USG Office of Research and Policy Analysis and the Tutor.com Administrative Portal.

This chapter outlines the research design used for this study, along with the research questions, research ethics, population and sample, data collection, data analysis, and limitations. The outcomes of this study will inform administrators of the implications of investing in tutoring resources for online students. This is applicable and vital information to institutions across the University System of Georgia and beyond and can be instrumental in identifying resources to set students up for success in higher education.

Research Questions

The purpose of this study was to investigate the relationship between the use of an outsourced online tutoring system and course success in the USG online eCore gateway courses to determine the extent of the relationship between this usage and course success. This study contained one primary research question which guided the research:

1. What is the probability of course success for students who used online tutoring?

In addition, the following secondary question was used to examine the quantity of usage to determine if increased usage is associated with greater student success:

2. For students who did use the online tutoring service, did a greater number of tutoring sessions and/or increased average length of tutoring sessions increase the probability of course success in online eCore gateway courses?

By answering these questions, the researcher aims to add to the existing body of literature which addresses the relationship between online tutoring and online course success to add further insight on the usefulness and implications of utilization of this resource.

Research Design

This study is a non-experimental quantitative study utilizing statistical analysis of archival data. These data were collected and obtained from the USG Office of Research and

Policy Analysis and the Tutor.com Administrative Portal and included student grade data and

tutoring usage for students enrolled in English Composition I (ENGL 1101), English

Composition II (ENGL 1102), Quantitative Reasoning (MATH 1001), Introduction to Math

Modeling (MATH 1101), College Algebra (MATH 1111), Precalculus (MATH 1113), or

Calculus I (MATH 1501) during the following six semesters: summer 2020, fall 2020, spring

2021, summer 2021, fall 2021, and spring 2022. Since USG eCore began offering Tutor.com as a

tutoring option for students beginning in summer 2020, this term is the first relevant semester

which can be studied.

      Creswell and Creswell (2018) noted that the quantitative approach should be utilized

when seeking to understand the utility of specific interventions and further stated that using

quantitative methods to analyze archival data is appropriate and useful when the study involves

repeated measures over a period of time. For the purpose of this study, course success is

measured by passing the course, as indicated by receiving a final grade of A, B, or C. Students

who earned a final grade of I, D, or F and those who withdrew (W) from the course were

considered unsuccessful in the course. Although the USG notes that a grade of D is "passing"

due to earning a 1.00 Grade Point Average (GPA) out of a 4.00 GPA system (USG Policy

Manual, 2022), meaning that the grade may be able to count toward their total earned hours,

students often must receive a C or better to meet the core area requirements or prerequisite

completion. Additionally, since a status of I (incomplete) for a course is simply a placeholder

until the status is replaced with the grade, researchers cannot assume that an I will ultimately

lead to a passing grade. Finally, when students withdraw (W) from a course, there may be

negative academic implications. Many USG institutions have implemented withdrawal limits for

students, enforcing a maximum number of times that students can withdraw from their courses

without academic implications. Once students have surpassed this number, the W will factor into their GPA as a 0.0. Therefore, each grade/status of I, D, or W, in addition to a grade of F, were deemed unsuccessful.

Research Ethics

The researcher followed standard procedures for obtaining and analyzing data to ensure ethical research practices. First, the researcher only sought to obtain data within the scope of the research study. These data were de-identified and synthesized by other personnel prior to giving access to the researcher, which ensured that no specific student information was identified to the researcher.

The researcher completed a Human Subjects Social and Behavior Research course through the Collaborative Institutional Training Initiative (CITI) and has an active certificate. Prior to obtaining any data, the researcher sought and obtained approval from the Georgia Southern University Institutional Review Board (IRB) (see Appendix A). As a part of this approval, a letter of cooperation from the Dean of USG eCampus (see Appendix B) was provided to the Georgia Southern University IRB to ensure that the organization was supportive of the upcoming research.

Population and Sample

Participants for this study were students from 21 University System of Georgia (USG) institutions who were enrolled in eCore ENGL 1101, ENGL 1102, MATH 1001, MATH 1101, MATH 1111, MATH 1113 or MATH 1501 during summer 2020, fall 2020, spring 2021, summer 2021, fall 2021, and spring 2022 semesters. These institutions include four comprehensive universities, eight state universities, and nine state colleges. The student enrollment in the selected gateway courses during the timeframe was 20,733. Female students

accounted for 62% of the students enrolled. The largest race/ethnicity groups were White

students (45%), followed by Black students (33%). The majority of students were classified as

freshmen at 53%, followed by the sophomore classification at 18%.

Of the students enrolled in the courses, a total of 2,137 students utilized the tutoring

service at least once during the timeframe of the study, comprising just over 10% of the enrolled

population. The majority of the students (63%) utilized the synchronous tutoring option of

working directly with a tutor, while 37% of the students utilized the asynchronous option of

submitting their writing or math question(s) for review by a tutor.

Data Collection

Prior to beginning data collection, the researcher sought and obtained approval from the

Georgia Southern University Institutional Review Board (IRB). Once IRB approval was

received, three data collection points were utilized: final grade data for each selected gateway

course for the summer 2020 - spring 2022 terms, tutoring usage, including number of tutoring

sessions attended and the average length of each session attended, from the summer 2020 -

spring 2022 terms, and demographic data for all students enrolled in the courses during these

terms. The final grade data and student demographic data were already obtained from the USG

Office of Research and Policy Analysis by the eCampus Data Analytics team as part of the

typical yearly procedure of data sharing for the purpose of producing the eCore Factbook. The

final grade data noted the final grade earned by each student enrolled in the identified course

during the specified terms. All courses are graded on a letter scale of A, B, C, D, F, W, or I and

passing grades for these courses for the purposes of this study are A, B, or C. The demographic

data included the following student characteristics: gender, race, and classification. These data

were collected to provide a portrait of those students in gateway courses who used or did not use

the online tutoring service. The final dataset, tutoring usage, was obtained from the tutoring administrative portal by a member of the eCampus Data Analytics team, which provides a comprehensive student activity report, including the number of times each student accessed the service, the length of each session, and in which course. The three data sets were then compiled and synthesized, de-identified, and provided to the researcher.

Data Analysis

This study utilized a quantitative approach to investigate the relationship between students' use of an online tutoring service and their academic success in online gateway courses over the course of two years as measured by their final grades in these courses. The primary research question, which sought to find the probability of course success for students who used online tutoring in online eCore gateway courses, was analyzed using logistic regression. Logistic regression was selected as the statistical analysis tool due to the investigation of a relationship and probability between utilizing online tutoring and course success. The usage of the online tutoring service (used/did not use) was the categorical predictor variable, while course success (as determined by grade earned) was the binary criterion variable. One analysis for each course was conducted, and all students who attempted each course were included in the analysis. Since logistic regression attempts to predict the probability of an event occurring into one of two categories of a dichotomous dependent variable based on one or more independent variables (Laerd Statistics, 2017), this statistical analysis is appropriate for addressing the research question. The logistic regression describes what percentage of the variability in course success can be explained by the use of tutoring service.

The secondary research question only focused on students who used the online tutoring service and determined if the number of tutoring sessions and length of tutoring sessions were

useful in explaining course success. The two continuous predictor variables for the secondary

research question were the number of tutoring sessions and average length of tutoring sessions

and the binary criterion variable was, again, course success. Logistic regression was utilized to

address this secondary research question, and each course was analyzed separately. Laerd

Statistics (2017) notes that logistic regression analysis is helpful to discover the relationship

between a dichotomous dependent (criterion) variable and one or more categorical or continuous

independent (predictor) variables; therefore, logistic regression analysis was selected as the

appropriate statistical analysis since the researcher planned to predict the likelihood of course

success based on tutoring usage. Additionally, logistic regression analysis allowed the researcher

to determine how each predictor variable contributes to the predictability, which means that

predictor variables associated with online tutoring usage such as average length of session or

number of sessions can be analyzed to determine their relationship with the criterion variable of

course success.

The dataset received by the eCampus Data Analytics team was imported into IBM

Statistical Package for the Social Sciences (SPSS) software for the statistical analysis. Prior to

proceeding, the researcher ensured that the dataset was not missing substantial data. Since the

process of obtaining student data by the eCampus Data Analytics team is routine and consistent,

the researcher was confident that no significant data would be omitted.

Chapter Summary

This study utilized archival data in a non-experimental quantitative study using logistic

regression analysis to determine whether students' use of online tutoring services is associated

with their academic success in online gateway courses. The participants for this study are

students from 21 University System of Georgia (USG) institutions who were enrolled in eCore

composition or math gateway courses during six subsequent semesters. Three datasets were obtained - student grade data and demographic data were obtained from the USG Office of Research and Policy Analysis, while tutoring data were obtained from the Tutor.com administrative portal. The eCampus Data Analytics team de-identified and synthesized all three data sets prior to providing these to the researcher. The criterion variable for this study was course success, and the predictor variables were the number of tutoring sessions and the average length of these sessions. The results of this research will enhance the current body of research on online tutoring as it relates to success in online learning.

CHAPTER FOUR

FINDINGS

The purpose of this study was to determine the probability of course success in USG

eCore online gateway courses for students who used an online tutoring service to better guide the

implementation and practice of quality student support services for online learners. The

researcher developed a non-experimental quantitative study utilizing statistical analysis of

archival data, which included student grade data and tutoring usage for students enrolled in

English Composition I (ENGL 1101), English Composition II (ENGL 1102), Quantitative

Reasoning (MATH 1001), Introduction to Math Modeling (MATH 1101), College Algebra

(MATH 1111), Precalculus (MATH 1113), or Calculus I (MATH 1501) during the following six

semesters: summer 2020, fall 2020, spring 2021, summer 2021, fall 2021, and spring 2022. Data

utilized for this study were obtained from the USG Office of Research and Policy Analysis and

the Tutor.com Administrative Portal and included student demographics, grades earned, and

online tutoring usage for the respective semesters. The study contains one primary research

question which guided the study:

1. What is the probability of course success for students who used online tutoring?

In addition, the following secondary question was used to examine the quantity of usage to

determine if increased usage is associated with greater course success:

2. For students who did use the online tutoring service, did a greater number of tutoring

   sessions and/or increased average length of tutoring sessions increase the probability of

   course success in online eCore gateway courses?

Logistic regression was used to address both research questions. Since logistic regression

attempts to predict the probability of an event occurring into one of two categories of a binary

dependent variable based on one or more independent variables (Laerd Statistics, 2017), this statistical analysis is appropriate for addressing the research questions. For research question one, logistic regression explained what percentage of the variability in course success was explained by the use of the online tutoring service, and for research question two, logistic regression revealed the likelihood of course success based on the amount of tutoring usage.

This chapter displays the research findings through data tables and narrative discussion. Descriptive statistics for the population and sample are provided, followed by assumption testing for logistic regression and the logistic regression analysis results for each research question. Chapter Four culminates with a summary of the findings, and Chapter Five then expands upon these findings.

Population and Sample

Participants for this study were students from 21 University System of Georgia (USG) institutions who were enrolled in eCore ENGL 1101, ENGL 1102, MATH 1001, MATH 1101, MATH 1111, MATH 1113 or MATH 1501 during summer 2020, fall 2020, spring 2021, summer 2021, fall 2021, and spring 2022 semesters. These institutions include four comprehensive universities, eight state universities, and nine state colleges. The number of students who were enrolled in the identified courses during the time period was 20,733. Overall, the success rate for the MATH courses (70.17%) was higher than the ENGL courses (66.93%) regardless of tutoring usage. Table 1 shows the sociodemographic characteristics of the student population. Female students accounted for 62% of the students enrolled. The largest race/ethnicity groups were White students (45%), followed by Black students (33%). The majority of students were classified as freshmen at 53%.

Table 1

Sociodemographic Characteristics of USG Students Enrolled in Gateway eCore Courses

Characteristics	*n*	%
Gender		
Female	12805	61.76
Male	7778	37.52
Not Reported	150	0.72
Race		
White	9311	44.91
Black	6932	33.43
Hispanic	2328	11.23
Multiracial	877	4.23
Asian or Native Hawaiian/Pacific Islander	786	3.79
American Indian/Alaska Native/Not Reported	499	2.40
Classification		
Freshman	11071	53.40
Sophomore	3786	18.26
Dual Enrollment	3228	15.57
Junior	1386	6.68
Senior	797	3.84
Other/Not Reported	465	2.24

Note. N = 20,733.

The secondary research question focused on students who utilized the online tutoring service for their gateway course(s) one or more times. This count of students was 2,137. Table 2 shows the sociodemographic characteristics of this student population. Female students accounted for the majority of students who used the online tutoring service (74%). Race/ethnicity for the population was 49% White students followed by 29% Black students. Students at freshman standing comprised 48% of the tutoring usage while 29% of students were classified as dual enrolled (high school) students.

Table 2

Sociodemographic Characteristics of USG Students Enrolled in Gateway eCore Courses who Utilized Tutoring Support through Tutor.com

Characteristics	*n*	%
Gender		
Female	1576	73.75
Male	549	25.69
Not Reported	12	0.56
Race		
White	1042	48.76
Black	628	29.39
Hispanic	230	10.76
Asian or Native Hawaiian/Pacific Islander	107	5.01

Characteristics	*n*	%
Multiracial	81	3.79
American Indian/Alaska Native/Not Reported	49	2.29
Classification		
Freshman	1024	47.92
Dual Enrollment	625	29.25
Sophomore	293	13.71
Junior	93	4.35
Senior	58	2.71
Other/Not Reported	44	2.06

Note. n = 2,137.

Table 3 shows the descriptive statistics for the two predictor variables for research question two – the number of sessions used and the average time spent in the session(s) for each course.

Table 3

Descriptive Statistics for Number of Sessions and Average Session(s) Length

Course	Variable	*M*	*SD*	Range
ENGL 1101	Number of Sessions	3.58	5.02	1–57
	Average Minutes per Session	35.82	13.78	1.05–93.10

Course	Variable	*M*	*SD*	Range
ENGL 1102	Number of Sessions	3.95	6.31	1–105
	Average Minutes per Session	35.88	13.94	1–70.40
MATH 1001	Number of Sessions	3.06	3.65	1–15
	Average Minutes per Session	22.86	14.01	1.02–52.57
MATH 1101	Number of Sessions	11.81	18.47	1-73
	Average Minutes per Session	17.88	11.44	1.52–39.15
MATH 1111	Number of Sessions	6.27	10.99	1–50
	Average Minutes per Session	28.41	15.90	1.70–59.23
MATH 1113	Number of Sessions	7.18	13.34	1–57
	Average Minutes per Session	24.78	15.57	1.55-60.23
MATH 1501	Number of Sessions	10.50	17.45	1–97
	Average Minutes per Session	29.94	16.21	1.57–67.37
Overall	Number of Sessions	4.34	7.61	1–105
	Average Minutes per Session	34.67	14.44	1–93.10

Note. $n = 2{,}137$.

Logistic Regression

The researcher used binary logistic regression analysis utilizing SPSS Statistics (Version 29) to analyze both research questions. When a criterion variable is dichotomous, logistic regression analysis is recommended (Laerd Statistics, 2017). For each research question, the criterion variable is course success (as determined by grade earned). If students attained a grade of A, B or C, they were classified as successful in the course, and if they received a grade of D, F, W, or I, they were classified as unsuccessful in the course. Dichotomous variables must be coded as 1 for having the attribute and as 0 for not having the attribute; therefore, successfully completing the course was coded as 1, while not successfully completing the course was coded as 0. The predictor variable for research question one is the use of online tutoring (yes = 1/no = 0). For research question two, the predictor variables are the number of online tutoring sessions and average time spent in tutoring sessions. Prior to completing logistic regression for the variables, the researcher completed several quality assurance tasks, including checking for missing data and verifying the seven standard assumptions for logistic regression.

Missing Data

There were no missing values in the data. To determine this, the researcher used the Missing Value Analysis in SPSS and found no missing values for either the criterion or predictor variables. Therefore, the researcher proceeded without omitting any student entries.

Assumptions

Laerd Statistics (2017) defines seven assumptions which must be satisfied prior to running statistical analysis for logistic regression. The assumptions are below:

1. At least one dichotomous dependent variable must exist.

2. One or more independent variables must be present, measured on either a continuous or categorical scale.

3. The researcher should have independence of observations and the variables should have mutually exclusive and exhaustive categories.

4. The minimum sample size must be 15 cases per predictor variable.

5. A linear relationship between any continuous independent variables and the logit transformation of the dependent variable must be present.

6. Multicollinearity must not exist between predictor variables.

7. Significant outliers should not be present in the data.

A review of the seven assumptions for each research question is explored below.

Research Question One Assumptions

Assumption one was met, as the criterion variable (course success) is dichotomous. The second assumption was met, as the predictor variable of tutoring utilization (used/did not use) was included in the analysis and is measured on a categorical scale. Assumption three was met since students could only be placed in one category for each of the two variables (course success and tutoring usage). The fourth assumption was met as well, since the student data had over 20,000 cases. Assumption five, which requires a linear relationship between continuous predictor variables and the logit transformation of the criterion variable, was satisfied due to the predictor variable being categorical. The sixth assumption is multicollinearity, which occurs when two or more predictor variables are intercorrelated and can impact the statistical significance (Laerd Statistics, 2017). Because research question one only has one predictor variable, this assumption is met. Finally, the seventh assumption addresses outliers. The researcher performed Casewise Diagnostics in SPSS to ascertain if any outliers were present in the data. Although there were

cases with a standardized residual greater than ±2.5, the researcher investigated each case and determined that each case did meet the parameters of the study. Therefore, each case was kept in the analysis. With all seven assumptions met, the researcher was able to perform binary logistic regression to determine the probability of course success for students who used online tutoring.

Research Question Two Assumptions

For research question two, assumption one was met, as the criterion variable (course success) is dichotomous. The second assumption was met as there were two predictor variables (number of sessions and average time spent) and both were measured on a continuous scale. Assumption three was met since students could only be placed in one of the dichotomous variables (course success or unsuccess). Further, students could only be placed in one of the continuous predictor variables, therefore they were mutually exclusive. The fourth assumption was met as well, since the data had over 2,000 student cases. Assumption five, which requires a linear relationship between continuous predictor variables and the logit transformation of the criterion variable was assessed via the Box-Tidwell (1962) procedure. A Bonferroni correction was applied, resulting in statistical significance being accepted when $p < .01$ (Tabachnick & Fidell, 2014). Based on this assessment, all continuous predictor variables were found to be linearly related to the logit of the criterion variable. The sixth assumption is multicollinearity, which occurs when two or more predictor variables are intercorrelated and can impact the statistical significance (Laerd Statistics, 2017). The value of Pearson's Correlation Coefficient (r) was -.05, $p = .021$, meaning that the strength of association between the two variables was small yet statistically significant. Using Variance Inflation Factors (VIF) in SPSS, the research found that all VIF values were below 10, which indicated that the assumption had been met. Table 4 shows the VIF values for each predictor variable.

Table 4

Assumption Six Testing, Variance Inflation Factors (VIF)

Variable	Tolerance	VIF
Total Number of Sessions	.998	1.003
Average Session Length	.998	1.003

Finally, the seventh assumption addresses outliers. The researcher performed Casewise Diagnostics in SPSS to ascertain if any outliers were present in the data. Although there were two cases with a standardized residual greater than ±2.5, the researcher investigated both cases and determined that each case did meet the parameters of the study. Therefore, each case was kept in the analysis. With all seven assumptions met, the researcher was able to perform binary logistic regression to determine the probability of course success for students based on the degree of usage of online tutoring.

Analysis of Research Question 1

The first research question aimed to determine the probability of course success for students who used online tutoring in seven USG eCore gateway courses. For this logistic regression analysis, the binary predictor variable was online tutoring usage, while the binary criterion variable was course success. Dichotomous variables must be coded as 1 for having the attribute and as 0 for not having the attribute, therefore using tutoring and course success were coded as 1, while not using tutoring and not successfully completing the course were coded as 0.

Of those who used the service, 92.95% experienced course success compared to 65.83% with course success who did not use tutoring. Each of the seven courses was analyzed separately. Table 5 shows each course with the respective students who used and did not use online tutoring,

along with the course success rates for each. Of the 20,733 students in the data file, 2,137 participated in the online tutoring service.

Table 5

Course Success by Tutoring Use

Course	Variable	Tutoring		Course Success	
		n	%	*n*	%
ENGL 1101	Used	876	21.21	811	92.58
	Did not use	3254	78.79	1790	55.01
ENGL 1102	Used	1005	15.62	945	94.03
	Did not use	5428	84.38	3524	64.92
MATH 1001	Used	17	1.58	14	82.35
	Did not use	1057	98.42	574	54.30
MATH 1101	Used	42	3.35	30	71.43
	Did not use	1210	96.65	699	57.77
MATH 1111	Used	62	1.66	57	91.94
	Did not use	3682	98.34	2742	74.47
MATH 1113	Used	55	1.93	37	67.27
	Did not use	2790	98.07	2024	72.54
MATH 1501	Used	80	6.37	71	88.75
	Did not use	1175	93.63	888	75.57

ENGL 1101

The logistic regression model was statistically significant for ENGL 1101, $\chi^2(1) = 502.46$, $p < .001$. The predictor variable of participating in online tutoring explains 15.6% (Nagelkerke R^2) of the variability in the criterion variable of course success. As shown in Table 6, the model correctly classified 63% of cases where the predicted event of receiving tutoring was observed.

Table 6

Classification Table for ENGL 1101

Observed			Predicted	
		Success		Percentage Correct
		No	Yes	
Success	No	0	1529	0
	Yes	0	2601	100
Overage Percentage				63

Note. The cut value is 0.50.

The predictor variable of participating in online tutoring is statistically significant in the equation, as shown in Table 7, Wald = 302.11, $p < .001$. The odds ratio of 10.21 means that students who participate in online tutoring are 10.21 times more likely to be successful in ENGL 1101.

Table 7

Logistic Regression Predicting Probability of Success in ENGL 1101 by Tutoring

	B	SE	Wald	*df*	*p*	Odds Ratio
Tutoring Usage	2.32	.134	302.11	1	< .001	10.21

ENGL 1102

The logistic regression model was also statistically significant for ENGL 1102, $\chi^2(1) =$ 427.89, p < .001. The predictor variable of participating in online tutoring explains 9.1% (Nagelkerke R^2) of the variability in the criterion variable of course success. As shown in Table 8, the model correctly classified 69.5% of cases where the predicted event of receiving online tutoring was observed.

Table 8

Classification Table for ENGL 1102

Observed		Predicted			
		Success			Percentage Correct
		No	Yes		
Success	No	0	1964		0
	Yes	0	4469		100
Overage Percentage					69.5

Note. The cut value is 0.50.

The predictor variable of participating in online tutoring is statistically significant in the equation, as shown in Table 9, Wald = 247.37, $p < .001$. The odds ratio of 8.51 means that students who participate in online tutoring are 8.51 times more likely to be successful in the course.

Table 9

Logistic Regression Predicting Probability of Success in ENGL 1102 by Tutoring

	B	SE	Wald	*df*	*p*	Odds Ratio
Tutoring Usage	2.14	.136	247.37	1	< .001	8.51

MATH 1001

For MATH 1001, the logistic regression model was statistically significant, $\chi^2(1) = 5.87$, $p = .015$. The predictor variable of participating in online tutoring explains only .7% (Nagelkerke R^2) of the variability in the criterion variable of course success. As shown in Table 10, the model correctly classified 54.7% of cases where the predicted event of receiving online tutoring was observed. The predictor variable of participating in online tutoring is statistically significant in the equation, as shown in Table 11, Wald = 4.58, $p = .032$. The odds ratio of 3.93 means that students who participate in online tutoring are 3.93 times more likely to be successful in the course.

Table 10

Classification Table for MATH 1001

Observed			Predicted	
		Success		Percentage Correct
		No	Yes	
Success	No	0	486	0
	Yes	0	588	100
Overage Percentage				54.7

Note. The cut value is 0.50.

Table 11

Logistic Regression Predicting Probability of Success in MATH 1001 by Tutoring

	B	SE	Wald	df	p	Odds Ratio
Tutoring Usage	1.37	.64	4.58	1	.032	3.93

MATH 1101

For MATH 1101, the logistic regression model was not statistically significant, $\chi^2(1) =$ 3.25, $p = .071$. Therefore, the researcher found no statistical evidence that the predictor variable of using online tutoring can be used to explain the probability of course success.

MATH 1111

The logistic regression model was statistically significant for MATH 1111, $\chi^2(1) = 12.33$, $p < .001$. The predictor variable of participating in online tutoring explains .5% (Nagelkerke R^2)

of the variability in the criterion variable of course success. As shown in Table 12, the model

correctly classified 74.8% of cases where the predicted event of receiving online tutoring was

observed.

Table 12

Classification Table for MATH 1111

Observed			Predicted		
			Success		Percentage Correct
		No	Yes		
Success	No	0	945		0
	Yes	0	2799		100
Overage Percentage					74.8

Note. The cut value is 0.50.

The predictor variable of participating in online tutoring is statistically significant in the

equation, as shown in Table 13, Wald = 8.49, p = .004. The odds ratio of 3.91 means that

students who participate in online tutoring are 3.91 times more likely to be successful in MATH

1111.

Table 13

Logistic Regression Predicting Probability of Success in MATH 1111 by Tutoring

	B	SE	Wald	*df*	*p*	Odds Ratio
Tutoring Usage	1.36	.47	8.49	1	.004	3.91

MATH 1113

For MATH 1113, the logistic regression model was not statistically significant, $\chi^2(1) =$ .725, $p = .394$. Therefore, the researcher found no statistical evidence that the predictor variable of using online tutoring can be used to explain the probability of course success.

MATH 1501

Lastly, the logistic regression model was statistically significant for MATH 1501, $\chi^2(1) =$ 8.382, $p = .004$. The predictor variable of participating in online tutoring explains 1% (Nagelkerke R^2) of the variability in the criterion variable of course success. As shown in Table 14, the model correctly classified 76.4% of cases where the predicted event of receiving online tutoring was observed.

Table 14

Classification Table for MATH 1501

Observed			Predicted		
			Success		Percentage Correct
		No		Yes	
Success	No	0		296	0
	Yes	0		959	100
Overage Percentage					76.4

Note. The cut value is 0.50.

The predictor variable of participating in online tutoring is statistically significant in the equation, as shown in Table 15, Wald $= 6.749$, $p = .009$. The odds ratio of 2.55 means that

students who participate in online tutoring are 2.55 times more likely to be successful in MATH 1501.

Table 15

Logistic Regression Predicting Probability of Success in MATH 1501 by Tutoring

	B	SE	Wald	*df*	*p*	Odds Ratio
Tutoring Usage	.94	.36	6.75	1	.009	2.55

Analysis of Research Question 2

The second research question aimed to determine whether an increased amount of online tutoring sessions and an increased amount of time spent in online tutoring sessions escalated the probability of course success for students who used online tutoring in USG eCore gateway courses. For this logistic regression analysis, the continuous predictor variables were the number of online tutoring sessions and the average number of minutes spent in online tutoring sessions, while the binary criterion variable was course success. Each of the seven courses was analyzed separately.

ENGL 1101

For ENGL 1101, 876 out of 4,130 enrolled students utilized online tutoring support during the timeframe of the study. Logistic regression was used to determine the probability of course success based on the number of online tutoring sessions and average length of these sessions. The logistic regression model was statistically significant, $\chi^2(2) = 35.983$, $p < .001$. The predictor variables of the number of sessions and average length of sessions, as a set, explain 9.8% (Nagelkerke R^2) of the variability in the criterion variable of course success. As shown in

Table 16, based on using the two predictor variables, the model correctly classified 92.6% of

cases as passing the course.

Table 16

Classification Table for ENGL 1101

Observed		Predicted		
		Success		Percentage Correct
		No	Yes	
Success	No	0	65	0.0
	Yes	0	811	100.0
Overage Percentage				92.6

Note. The cut value is 0.50.

Both predictor variables were statistically significant in the equation, as shown in Table 17, with

the number of sessions, Wald = 6.271, p = .012 and average length of sessions, Wald = 20.850, p

< .001. The odds ratio for both variables was over 1 (1.199 for number of sessions and 1.04 for

average session length), meaning that the likelihood of passing ENGL 1101 increases as the

number of online tutoring sessions and average length of time in online tutoring sessions

increases.

Table 17

Logistic Regression Predicting Probability of Success in ENGL 1101 by Tutoring Usage

	B	SE	Wald	*df*	*p*	Odds Ratio
Total Sessions	.182	.072	6.271	1	.012	1.199
Average Session Length	.039	.009	20.85	1	< .001	1.04

ENGL 1102

For ENGL 1102, 1,005 out of 6,433 enrolled students utilized online tutoring support during the timeframe of the study. Logistic regression was used to determine the probability of course success based on the number of online tutoring sessions and average length of these sessions. As seen in Table 18, the logistic regression model was not statistically significant.

Table 18

ENGL 1102 Regression Model Fit

	Chi-Square	*df*	*p*
Model	3.731	2	.155

Therefore, the researcher found no statistical evidence that the predictor variables of number of online tutoring sessions and average length of each online tutoring session can be used to explain the probability of course success. Table 19 shows the variables in the equation for the course.

Table 19

Logistic Regression Predicting Probability of Success in ENGL 1102 by Tutoring Usage

	B	SE	Wald	*df*	*p*	Odds Ratio
Total Sessions	.012	.026	.197	1	.657	1.012
Average Session Length	.017	.009	3.592	1	.058	1.017

MATH 1001

During the timeframe of the study, 17 out of 1,074 enrolled students utilized online tutoring support for MATH 1001. Logistic regression was used to determine the probability of course success based on the number of online tutoring sessions and average length of these sessions. The logistic regression model was not statistically significant, as seen in Table 20.

Table 20

MATH 1001 Regression Model Fit

	Chi-Square	*df*	*p*
Model	1.040	2	.594

Therefore, the researcher found no statistical evidence that the predictor variables of number of online tutoring sessions and average length of each online tutoring session can be used to explain the probability of course success. Table 21 shows the variables in the equation for the course.

Table 21

Logistic Regression Predicting Probability of Success in MATH 1001 by Tutoring Usage

	B	SE	Wald	*df*	*p*	Odds Ratio
Total Sessions	.201	.318	.399	1	.527	1.222
Average Session Length	-.035	.045	.608	1	.436	.966

MATH 1101

For MATH 1101, 42 out of 1,252 enrolled students utilized online tutoring support during the timeframe of the study. Logistic regression was used to determine the probability of course success based on the number of online tutoring sessions and average length of these sessions. The logistic regression model was not statistically significant, as shown in Table 22.

Table 22

MATH 1101 Regression Model Fit

	Chi-Square	*df*	*p*
Model	1.643	2	.44

Therefore, the researcher found no statistical evidence that the predictor variables of number of online tutoring sessions and average length of each online tutoring session can be used to explain the probability of course success. Table 23 shows the variables in the equation for the course.

Table 23

Logistic Regression Predicting Probability of Success in MATH 1101 by Tutoring Usage

	B	SE	Wald	*df*	*p*	Odds Ratio
Total Sessions	.20	.026	.600	1	.439	1.021
Average Session Length	.019	.033	.320	1	.571	1.019

MATH 1111

A total of 62 out of 3,744 enrolled students utilized online tutoring support for MATH 1111 during the timeframe of the study. Logistic regression was used to determine the probability of course success based on the number of online tutoring sessions and average length of these sessions. As seen in Table 24, the logistic regression model was not statistically significant.

Table 24

MATH 1111 Regression Model Fit

	Chi-Square	*df*	*p*
Model	1.469	2	.48

Therefore, the researcher found no statistical evidence that the predictor variables of number of online tutoring sessions and average length of each online tutoring session can be used to explain the probability of course success in MATH 1111. Table 25 shows the variables in the equation for the course.

Table 25

Logistic Regression Predicting Probability of Success in MATH 1111 by Tutoring Usage

	B	SE	Wald	*df*	*p*	Odds Ratio
Total Sessions	.113	.173	.428	1	.513	1.120
Average Session Length	-.012	.028	.192	1	.661	.988

MATH 1113

During the timeframe of the study, 55 out of 2,845 enrolled students utilized online tutoring support for MATH 1113. Logistic regression was used to determine the probability of course success based on the number of online tutoring sessions and average length of these sessions. The logistic regression model was not statistically significant, as seen in Table 26.

Table 26

MATH 1113 Regression Model Fit

	Chi-Square	*df*	*p*
Model	2.401	2	.301

Therefore, the researcher found no statistical evidence that the predictor variables of number of online tutoring sessions and average length of each online tutoring session can be used to explain the probability of course success in the course. Table 27 shows the variables in the equation for MATH 1113.

Table 27

Logistic Regression Predicting Probability of Success in MATH 1113 by Tutoring Usage

	B	SE	Wald	*df*	*p*	Odds Ratio
Total Sessions	.046	.037	1.489	1	.222	1.047
Average Session Length	-.005	.018	.088	1	.767	.995

MATH 1501

For MATH 1501, 80 out of 1,255 enrolled students utilized online tutoring support during the timeframe of the study. Logistic regression was used to determine the probability of course success based on the number of online tutoring sessions and average length of these sessions. As seen in Table 28, the logistic regression model was not statistically significant.

Table 28

MATH 1501 Regression Model Fit

	Chi-Square	*df*	*p*
Model	2.763	2	.251

Therefore, the researcher found no statistical evidence that the predictor variables of number of online tutoring sessions and average length of each online tutoring session can be used to explain the probability of course success for MATH 1501. Table 29 shows the variables in the equation for the course.

Table 29

Logistic Regression Predicting Probability of Success in MATH 1501 by Tutoring Usage

	B	SE	Wald	*df*	*p*	Odds Ratio
Total Sessions	.046	.046	1.004	1	.316	1.047
Average Session Length	.021	.022	.867	1	.352	1.021

Chapter Summary

The purpose of this study was to determine the probability of course success in USG eCore online gateway courses for students who used online tutoring services. The researcher developed a non-experimental quantitative study utilizing statistical analysis of archival data, which included student grade data and tutoring usage for students enrolled in English Composition I (ENGL 1101), English Composition II (ENGL 1102), Quantitative Reasoning (MATH 1001), Introduction to Math Modeling (MATH 1101), College Algebra (MATH 1111), Precalculus (MATH 1113), or Calculus I (MATH 1501) during six semesters spanning two years. The primary research question looked at all students enrolled in the courses during the timeframe of the study and attempted to determine the probability of course success for students who used online tutoring, using the predictor variable of used tutoring/did not use tutoring and the criterion variable of course success. The secondary research question examined the quantity of usage to determine if increased usage is associated with greater course success. The predictor variables for research question two were the number of tutoring sessions used and the average amount of time spent in tutoring sessions, while the criterion variable remained course success.

The logistic regression models pertaining to research question one were statistically significant for ENGL 1101 (Nagelkerke R^2 = 15.6%), ENGL 1102 (Nagelkerke R^2 = 9.1%),

MATH 1001 (Nagelkerke R^2 = .7%), MATH 1111 (Nagelkerke R^2 = .5%), and MATH 1501 (Nagelkerke R^2 = 1%). Results indicated that utilizing online tutoring for these courses increases students' chance of success in the given course. However, although these results were statistically significant, the percentage of variability explained is low, especially for the math courses, meaning that there may be other variables that better predict the likelihood of course success. Conversely, students who obtained online tutoring in MATH 1101 and MATH 1113 courses were not found to have an increased chance of success in their courses.

Regarding the secondary research question, the logistic regression model was statistically significant for ENGL 1101. For ENGL 1101, an increased number of online tutoring sessions and an increased average time spent in online tutoring sessions increased students' probability of success in their course. However, for all other courses studied (ENGL 1102, MATH 1001, MATH 1101, MATH 1111, MATH 1113, and MATH 1501), the regression model for each of these courses was not statistically significant. Further discussion, along with recommendations and implications for practice, is presented in Chapter Five.

CHAPTER FIVE

SUMMARY, DISCUSSION, AND IMPLICATIONS

The purpose of this quantitative study was to determine the extent of the relationship between the use of an outsourced online tutoring system and course success in online USG eCore gateway courses. This research study sought to examine the relationship between the usage of an online tutoring system and course success in USG eCore gateway courses. Chapter Five provides a summary of the first four chapters, discussion surrounding the research findings and how they relate to existing literature, implications for practice, and recommendations for future research. The chapter ends with the researcher's concluding remarks.

As the United States college student debt crisis continues to escalate, the nation is focusing on institutional outcomes, particularly progression and graduation rates. National and state efforts are designed to implement policies and programs to elevate graduation rates across the country. Some initiatives are focusing directly on students' first-year experiences as a crucial factor in their matriculation, identifying three gateway courses which, if successfully completed during a student's first year of college in one state, have been shown to increase the six-year graduation rate by 60 percentage points (Denley, 2017). With English Composition I and II as two of the three gateway courses, it is apparent that student writing skills are critical for academic and professional success. Additionally, because academic writing will be a requirement in nearly all courses, writing preparedness will be a crucial component of students' higher education journey. Unfortunately, students' academic writing preparedness is notably lacking across the nation, supporting a need for interventions and further support (Hembrough & Jordan, 2020).

The remaining gateway course is an introductory mathematics course. Although this course is designed to be a fundamental mathematics course, it continues to be a challenge and barrier to first year students. Harrell and Lazari (2020) noted that the success (or lack of success) in students' first college mathematics course has a substantial impact on academic progression. Failing to succeed in introductory mathematics and English courses can lead to a variety of outcomes that may delay or prohibit student progression, including changes in academic major, delay in graduation progression, and a decrease in the likelihood of immediate retention (Harrell & Lazari, 2020). While barriers to student writing and mathematics success do exist, including readiness and lack of meaningful resources, institutions attempt to mitigate these barriers by providing traditional resources to improve student performance, including various methods of tutoring. Research shows that tutoring is beneficial to students' confidence and positively impacts their academic performance (Arco-Tirado et al., 2019; Williams & Takaku, 2011; Wingate, 2010).

While traditional tutoring, whether facilitated by faculty/staff or peers, is a standard fixture at the majority of higher education institutions, online tutoring is growing as a tutoring mode due to the rising presence of online education (Britto & Rush, 2013). Research shows that tutoring delivered online can be as effective as face-to-face tutoring (Richardson, 2009) and that online tutoring is an effective strategy to improve student course outcomes (Riley, 2019). However, there is a gap in the literature regarding more extensive research on online tutoring, including the relationship between usage of this resource and course success. It is imperative to understand the benefits of online tutoring systems to students enrolled in online courses. With online learning programs continuing to grow across the country, online students must have relevant and quality services at their convenience. Understanding the implications of the quantity

of online tutoring usage on students' performance in online gateway courses can greatly assist state and national initiatives in retention and graduation efforts.

The purpose of this quantitative study was to investigate the relationship between students' use of the online tutoring services and course success (as measured by final course grades) in online USG eCore gateway courses to determine the probability of course success for students who used online tutoring. Further, the quantity of usage was studied to determine if a greater number of tutoring sessions and increased average length of session resulted in an increased probability of being successful in the courses.

The researcher specifically investigated the following primary and secondary research questions:

1. What is the probability of course success for students who used online tutoring?

2. For students who did use the online tutoring service, does a greater number of tutoring sessions and/or average length of tutoring sessions increase the probability of course success in online eCore gateway courses?

Logistic regression was used to address both research questions using archival data over the course of two years. For the primary research question, logistic regression explained what percentage of the variability in course success can be explained by the use of tutoring service, and for the secondary research question, logistic regression was used to determine the likelihood of course success based on the amount of tutoring usage.

Summary of Findings

Significant findings from the research questions are presented in this section. The first portion of the section addresses the primary research question to determine the probability of course success for students who used online tutoring services. The second portion of the section

reviews the secondary research question, which focuses only on those students who used tutoring services, specifically addressing the quantity of usage (number of online tutoring sessions and average length of time spent in these sessions) and whether it predicts the likelihood of course success.

Influence of Online Tutoring on Course Success

The primary research question sought to determine if participating in online tutoring for USG eCore gateway courses increased students' probability of being successful in the course. The researcher utilized de-identified data from USG eCore courses ENGL 1101, ENGL 1102, MATH 1001, MATH 1101, MATH 1111, MATH 1113, and MATH 1501 over a period of two years. With course success as the criterion variable and tutoring usage as the predictor variable, the researcher found that for five of the courses, the use of online tutoring increased a student's chance of success in the course. ENGL 1101 had the highest odds ratio of the courses, with students who participated in tutoring being 10.21 times more likely to be successful in the course. For ENGL 1102, students who participated in tutoring were 8.5 times more likely to be successful. For both MATH 1001 and MATH 1111, students participating in tutoring were 3.9 times more likely to be successful in the course, and for MATH 1501, students were 2.55 times more likely to be successful in the course. For both MATH 1101 and MATH 1113, the models were not statistically significant; therefore, the researcher found no evidence that participation in online tutoring increased the probability of success in these two courses.

Influence of Increased Usage of Online Tutoring on Course Success

The secondary research question studied only the students who used the tutoring service during the specified timeframe, which accounted for approximately 10% of the total number of students enrolled in the courses. This question aimed to determine whether an increased amount

of tutoring sessions and an increased amount of time spent in tutoring sessions expanded the probability of course success for students who used online tutoring in USG eCore gateway courses. For this logistic regression analyses, the continuous predictor variables were the number of tutoring sessions and the average time spent in tutoring sessions, while the binary criterion variable was course success. The researcher found that the only course in which the two predictor variables have a statistically significant relationship to course success was ENGL 1101. The odds ratio for both variables was over 1 (1.199 for number of sessions and 1.04 for average session length), meaning that the likelihood of passing ENGL 1101 increases as the number of tutoring sessions and average length of time in tutoring sessions increases. For the remaining six courses, the logistic regression models were not statistically significant, therefore there was no statistical evidence that the number of sessions and average time spent in sessions increased the probability of success in these courses. After the researcher determined that the two predictor variables as a pair yielded no statistical significance, each predictor variable was tested independently. However, testing each predictor variable independently also did not yield statistically significant results.

These data provide the first step in determining if online academic tutoring is beneficial for online college student success. They also provide a basis for decisions regarding implementation, continuation, and promotion of online tutoring for students.

Discussion of the Findings

This study examined the extent of the relationship between online tutoring and course success in online core courses. Although research on online tutoring is not extensive, there have been academic studies focused on online tutoring and the impact on students' performance and self-perception. The researcher also sought to better understand how the amount of online

tutoring usage may influence the probability of course success. Discussion of the findings and the relationship to existing literature are reviewed in this section.

Typically, college students seek tutoring on their own, since most courses or programs do not require supplemental instruction or remediation. Therefore, students not only must be aware of their own need for assistance and where to obtain this assistance, but they must also possess the motivation to seek out the service needed. Unfortunately, research reinforces that university students are not aware of the student services available to them at their institutions, including tutoring resources (Perry et al., 2020). This research study seems to support this notion, as only 10% of the students in the identified courses utilized the service, although many more were struggling academically, as demonstrated by the 31% of students who were not successful in the courses overall.

Research supports that online tutoring is positively impactful on student academic achievement (Rennar-Potacco et al., 2017; Richardson, 2009; Riley, 2019; Roberts & Goss, 2009). The current study supports this previous research through its findings that utilizing online tutoring increased the probability of course success for five of the online gateway courses analyzed. Each of these results were statistically significant and demonstrated that students who utilized online tutoring were at an increased chance of successfully completing their respective courses. Conversely, students who obtained online tutoring in MATH 1101 and MATH 1113 courses were not found to have an increased chance of success in their courses.

While there is literature to support that increased use of face-to-face tutoring has a positive impact on students' academic performance (Cooper, 2010; Pfrenger et al., 2017; Rendleman et al., 2019; Williams & Takaku, 2011; Williams et al., 2006), there is little evidence in current research to support that greater use of online tutoring is associated with increased

academic outcomes. However, one study which focused on the relationship between the quantity of online tutoring and course success in composition courses in a University System of Georgia online program suggested that students who utilized writing support through online tutoring are more likely to pass the course than those who did not (Miles et al., 2021). The current research study did find similar results for ENGL 1101, as the number of online tutoring sessions and average amount of time spent in session(s) were found to be statistically significant to course success, with an odds ratio of 1.199 for total sessions and 1.04 for average session length. This explains that the likelihood of passing ENGL 1101 increases as the number of online tutoring sessions and average length of time in online tutoring sessions increase. However, no statistically significant findings were associated with the predictor variables as a set in the other six courses (ENGL 1102, MATH 1001, MATH 1101, MATH 1111, MATH 1113, MATH 1501), indicating that the amount of online tutoring usage does not have a statistical relationship with student academic performance in the majority of the courses studied.

Limitations

The varying number of participants who utilized the online tutoring service in the courses could be a limitation. While the usage for the courses analyzed in this study accounted for approximately 10% of students in the studied courses, the sample sizes for some courses were substantially smaller than others. Math courses had a very low rate of students who utilized online tutoring, with only 12% of students seeking online tutoring in their math courses. Students in the two English Composition courses comprised 88% of the total tutoring usage, although the enrollments in math courses versus English courses were very similar. This could have influenced the outcomes for Research Question Two and affected the generalizability of the results.

Not controlling for academic history could also be a limitation. Without knowing students' Grade Point Average (GPA) prior to taking the courses studied, it remains unclear what type of student is accessing online tutoring. For example, dual enrolled students must typically attain higher standards of admission into institutions of higher education than the general population. They are traditionally high-performing students, and dual enrolled students who take eCore courses retain the highest course success rate of any classification of students taking eCore courses (as opposed to freshman, sophomore, junior, or senior status) (eCore Factbook, 2021). In this study, 29% of students obtaining online tutoring were dual enrolled students. Knowing the vast majority of dual enrolled students are successful in college courses raises the question of whether these students would have been successful with or without online tutoring. Controlling for incoming characters such as GPA would mitigate this limitation of the current study.

Implications for Practice

This study examined the extent of the relationship between an online academic tutoring service and course success in USG eCore gateway courses, with the intent to add to the limited body of research regarding online tutoring and higher education student success. Results from the study confirmed that utilizing online tutoring did increase the probability of course success in five of the seven gateway courses studied; however, the amount of usage was significant in predicting course success for only one course (ENGL 1101). The findings from this research study can provide direction and further research opportunities to higher education practitioners, educators, and state policymakers.

Due to the relationship found between the use of the online tutoring service and increased course success in the majority of the courses studied, these results should be shared with USG eCore stakeholders for further review on next steps. Because no previous studies have been

conducted at the program level to verify that the service assists students with their academic performance, the results may initiate new ways to encourage usage of the service amongst students. To encourage stakeholders to understand the benefit of the online tutoring service, there are several ways for USG eCore to communicate findings. As students look to their faculty members to guide course expectations and recommendations on their academic progression, faculty members should be informed of this study's findings, with the intent to appropriately communicate with students when they may be able to best benefit from the service. Further, because the study results suggest that tutoring is helpful to academic performance, but that increased usage does not have a statistically significant relationship with course success, a tutoring session touchpoint in the course may be encouraged by the instructors. This will ensure that students understand the online tutoring service and how to access it, in the event that they would benefit from subsequent sessions either in that course or a future course. Additionally, practitioners working with USG eCore should implement communication to students which promotes the online tutoring service as a free, helpful service which may have a positive impact on their academic performance. This could include strategic email and text campaigns to students before and during the term, as well as customized communication outreach by the eCore Student Success Team, who provides direct additional outreach to students. Due to the low numbers of students utilizing online tutoring for their math courses, it will be especially important to advertise tutoring services to these students. Educating and engaging faculty and students should help to promote and increase the usage of the tutoring service for those who would benefit from supplemental academic assistance.

This data should also be shared with USG policymakers to potentially inform system initiatives and policies related to institutional tutoring services. While all USG institutions offer

traditional tutoring in a face-to-face format, many USG institutions do not offer comprehensive online tutoring services for their online learners. This research may assist in the exploration and implementation of services which allow for easier access to tutoring for all students, regardless of location. Further, this data can also be shared beyond the USG to inform policies outside of the state.

<div align="center">**Recommendations for Future Research**</div>

While the results of the study did suggest that utilizing online tutoring increased students' probability of course success in the majority of the courses studied, the odds ratios, especially for the math courses, were low. This indicates that other variables exist which may further explain course success. The researcher's recommendations for future research are outlined below.

Further research is needed to evaluate and support the effectiveness of online tutoring to improve students' course success. As this study examined only seven courses during the span of two years, the researcher recommends that the study be replicated over an extended period of time in various other core courses to examine the relationship between usage of the service and subject areas other than English Composition and Mathematics. The outcomes in this study were likely influenced by the low sample sizes for mathematics tutoring, and with a more robust sample size of students who utilized tutoring in each course, more definitive results may be obtained. Further, other USG programs or institutions who utilize the Tutor.com online service could be consulted to compare research results. A broader array of student populations would help to reinforce the impact of the service.

Future research should also account for individual student characteristics. This study did not control for academic characteristics such as incoming GPA or student motivation. These may more fully explain the influence of the online tutoring service on the outcome. In addition, the

outcome of final grade could be more closely examined, as opposed to simply looking at whether students were successful or not. Including the actual letter grade received could be considered as outcome variables, as well as knowledge gains or behavior changes based on the online tutoring service. Simply using success/not successful could remove some insightful nuance in the data. Finally, including the students' home institution could be considered. Depending on the resources at students' institutions, students may be obtaining online tutoring services elsewhere.

Conclusion

Intentional and substantiated student support structures to enhance student success in gateway core courses are imperative for higher education institutions and programs, as competence in writing and math directly influences student success and completion in higher education. As online learning continues to grow across colleges and universities, quality online support must be offered in order to meet the needs of online students. Participation in online tutoring has been shown to improve students' academic performance; however, there is little research regarding the amount of online tutoring usage and the relationship to academic success.

Results of this study suggest that while online tutoring does increase students' probability of course success in some online gateway courses, it is not significant for all. Further, the only course which saw an increased probability of student success due to increased usage was ENGL 1101. The findings of this study reinforce previous research which link select courses' increased success to tutoring usage, especially in the area of English Composition. More expansive research should be conducted for implications across multiple subjects and increased sample sizes. Due to the relationship found between the usage of the online tutoring service and increased probability of course success in five USG eCore gateway courses, these results should

be shared in order to broaden studies on this topic and implement strategies to encourage use of

the service.

REFERENCES

Allen, I. E., & Seaman, J. (2011) *Going the distance: Online education in the United States, 2011.* Babson Survey Research Group.

https://www.onlinelearningsurvey.com/reports/goingthedistance.pdf

Alzahrani, A. A. (2019). The effect of distance learning delivery methods on student performance and perception. *International Journal for Research in Education, 43*(1), Article 12. https://scholarworks.uaeu.ac.ae/ijre/vol43/iss1/12

Anderton, R., Hine, G., & Joyce, C. (Eds.). (2017). Secondary school mathematics and science matters: Academic performance for secondary students transitioning into university allied health and science courses. *International Journal of Innovation in Science and Mathematics Education*, *25*(1), 34–27.

https://openjournals.library.sydney.edu.au/index.php/CAL/article/view/11317

Arco-Tirado, J. L., Fernández-Martín, F.D., & Hervás-Torres, M. (2019) Evidence-based peer-tutoring program to improve students' performance at the university. *Studies in Higher Education, 45*(11), 2190-2202. https://doi.org/10.1080/03075079.2019.1597038

Ashford-Rowe, K., & Howarth, D. (2011, April 3–6). *Changing the game: The Smarthinking experience* [Paper presentation]. Council of Australasian University Directors of Information Technology THETA Conference, Sydney, Australia. https://ccaeducause.files.wordpress.com/2011/04/debi-howarth.pdf

Atuahene, F., & Russell, T. A. (2016). Mathematics readiness of first-year university students. *Journal of Developmental Education*, *39*(3), 12–20.

https://www.jstor.org/stable/44987415

Bailey, A., Vaduganathan, N., Henry, T., Laverdiere, R., & Pugliese, L. (2018). *Making digital learning work*. The Boston Consulting Group/Arizona State University. https://edplus.asu.edu/sites/default/files/BCG-Making-Digital-Learning-Work-Apr-2018%20.pdf

Bawa, P. (2016). Retention in online courses: Exploring issues and solutions—A literature review. *SAGE Open*, *6*(1). https://doi.org/10.1177/2158244015621777

Beccaria, L., Kek, M., & Huijser, H. (2019). Using "just in time" online feedback to improve first year undergraduate nursing students' essay writing performance. *Journal of University Teaching & Learning Practice*, *16*(4). https://doi.org/10.53761/1.16.4.7

Belfield, C., Jenkins, D., & Lahr, H. (2016). *Momentum: The academic and economic value of a 15-credit first-semester course load for college students in Tennessee.* Community College Research Center Working Paper No. 88. Lumina Foundation. https://www.luminafoundation.org/resources/momentum-the-value-of-a-15-credit-first-semester-course-load

Bloemer, W., Swan, K., Day, S., & Bogle, L. (2018). Digging deeper into the data: The role of gateway courses in online student retention. *Online Learning Journal, 22*(4), 109-127. doi:10.24059/olj.v22i4.1515

Boquet, E. H. (1999). "Our little secret": A history of writing centers, pre-to post-open admissions. *College Composition and Communication, 50*(3), 463-482. https://doi.org/10.2307/358861

Boton, E. C., & Gregory, S. (2015). Minimizing attrition in online degree courses. *Journal of Educators Online, 12*(1). doi:10.9743/JEO.2015.1.6

Bradley, V. M. (2021). Learning management system (LMS) use with online instruction. *International Journal of Technology in Education, 4*(1), 68-92. https://doi.org/10.46328/ijte.36

Britto, M., & Rush, S. (2013). Developing and implementing comprehensive student support services for online students. *Journal of Asynchronous Learning Networks*, *17*(1), 29–42. http://dx.doi.org/10.24059/olj.v17i1.313

Broadbent, J., & Poon, W. L. (2015). Self-regulated learning strategies & academic achievement in online higher education learning environments: A systematic review. *The Internet and Higher Education, 27*, 1–13. https://doi.org/10.1016/j.iheduc.2015.04.007

Broadbent, J., & Lodge, J. (2021). Use of live chat in higher education to support self-regulated help seeking behaviours: A comparison of online and blended learner perspectives. *International Journal of Educational Technology in Higher Education*, *18*(1), 1–20. https://doi.org/10.1186/s41239-021-00253-2

Castro, M. D. B., & Tumibay, G. M. (2021). A literature review: Efficacy of online learning courses for higher education institution using meta-analysis. *Education and Information Technology, 26*, 1367–1385. https://doi.org/10.1007/s10639-019-10027-z

Causey, J., Pevitz, A., Ryu, M., Scheetz, A., & Shapiro, D. (2022). *Completing college: National and state report on six-year completion rates for fall 2015 beginning cohort* (Signature Report 20). National Student Clearinghouse Research Center. https://nscresearchcenter.org/wp-content/uploads/Completions_Report_2021.pdf

Cavus, N., Omonayajo, B., & Mutizwa, M. R. (2022). Technology acceptance model and learning management systems: Systematic literature review. *International Journal of Interactive Mobile Technologies*, *16*(23), 109-124. https://doi.org/10.3991/ijim.v16i23.36223

Colver, M., & Fry, T. (2015). Evidence to support peer tutoring programs at the undergraduate

 level. *Journal of College Reading and Learning, 46*(1), 16-41.

 doi:10.1080/10790195.2015.1075446

Complete College America. (n.d.). *Our work.* https://completecollege.org/about/

Complete College Georgia. (n.d.). *About Complete College Georgia*.

 https://completega.org/content/about-complete-college-georgia

Cooper, E. (2010.). Tutoring center effectiveness: The effect of drop-in tutoring. *Journal of*

 College Reading and Learning, *40*(2), 21–34.

 https://doi.org/10.1080/10790195.2010.10850328

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods*

 approaches (4th ed.). Sage Publications.

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed*

 methods approaches (5th ed.). Sage Publications.

D2L. (2023). *Brightspace Learning Management System.* https://www.d2l.com/brightspace/

DeAngelo, L., Franke, R., Hurtado, S., Pryor, J., & Tran, S. (2011). *Completing college:*

 Assessing graduation rates at four-year institutions. Higher Education Research Institute

 at UCLA. https://heri.ucla.edu/DARCU/CompletingCollege2011.pdf

DeFeo, D. J., Bonin, D., & der-Gobeille, M. O. (2017). Waiting and help-seeking in math

 tutoring exchanges. *Journal of Developmental Education*, *40*(3), 14–22.

de Jong, N., Verstegen, D. M., & Könings, K. D. (2017). The role of the e-tutor in synchronous

 online problem-based learning: A study in a master public health programme. *British*

 Journal of Educational Technology, 49(3), 385-397.https://doi.org/10.1111/bjet.12554

Denley, T. (2017). *Corequisite academy mathematics*. University System of Georgia. Complete

    College Georgia.

    http://completegeorgia.org/sites/default/files/resources/Denley_CoRequisite_Academy_

    Mathematics_0.pdf

Dollinger, M., Cox, S., Eaton, R., Vanderlelie, J., & Ridsdale, S. (2020). Investigating the usage

    and perceptions of third-party online learning support services for diverse students.

    Journal of Interactive Media in Education, 2020(1), Article 14.

    https://doi.org/10.5334/jime.555

eCore Factbook. (2021). *About.*

Fong, C. J., Gonzales, C., Hill-Troglin Cox, C., & Shinn, H. B. (2023). Academic help-seeking

    and achievement of postsecondary students: A meta-analytic investigation. *Journal of*

    Educational Psychology, 115(1), 1-21. https://doi.org/10.1037/edu0000725

Gardner Institute. (2017). *Gateways to completion*. https://www.jngi.org/gateways-to-completion

Gonzalez-Ramirez, J., Mulqueen, K., Zealand, R., Silverstein, S., Reina, C., BuShell, S., &

    Ladda, S. (2021). Emergency online learning: College students' perceptions during the

    COVID-19 crisis. *College Student Journal*, *55*(1), 29–46.

Hachey, A.C., Conway, K.M., Wladis, C., & Shirsti, K. (2022). Post-secondary online learning

    in the U.S.: An integrative review of the literature on undergraduate student

    characteristics. *Journal of Computing in Higher Education, 34,* 708–768.

    https://doi.org/10.1007/s12528-022-09319-0

Hampton, D., & Pearce, P. F. (2016) Student engagement in online learning nursing courses.

    Nurse Educator, 41(6), 294-298. https://doi.org/10.1097/NNE.0000000000000275

Hanham, J., Lee, C. B., & Teo, T. (2021). The influence of technology acceptance, academic

    self-efficacy, and gender on academic achievement through online tutoring. *Computers &*

    Education, 172, Article 104252. https://doi.org/10.1016/j.compedu.2021.104252

Harrell, G., & Lazari, A. (2020). Results of a placement system for the first college mathematics

    course. *Georgia Journal of Science*, *78*(2), Article 3.

    https://digitalcommons.gaacademy.org/gjs/vol78/iss2/3

Hembrough, T., & Jordan, J. (2020). Creating a digital writing classroom: A mixed methods

    study about a first-year composition tablet initiative. *International Journal of Instruction,*

    13(2), 567-586. https://doi.org/10.29333/iji.2020.13239a

Hrastinski, S., Stenbom, S., Benjaminsson, S., & Jansson, M. (2021). Identifying and exploring

    the effects of different types of tutor questions in individual online synchronous tutoring

    in mathematics. *Interactive Learning Environments*, *29*(3), 510-522.

    https://doi.org/10.1080/10494820.2019.1583674

Johns, C., & Mills, M. (2021). Online mathematics tutoring during the COVID-19 pandemic:

    Recommendations for best practices. *Primus, 31*(1), 99–117.

    doi:10.1080/10511970.2020.1818336

Karp, M. M., Hughes, K. L., & O'Gara, L. (2010). An exploration of Tinto's integration

    framework for community college students. *Journal of College Student Retention, 12*(1),

    69-86. https://doi.org/10.2190/CS.12.1.e

Kentnor, H. (2015). Distance education and the evolution of online learning in the United States.

    Curriculum and Teaching Dialogue, 17, 21-34.

    http://digitalcommons.du.edu/law_facpub/24

Kocdar, S., Karadeniz, A., Bozkurt, A., & Buyuk, K. (2018). Measuring self-regulation in self-paced open and distance learning environments. *The International Review of Research in Open and Distributed Learning, 19*(1), 25-43. https://doi.org/10.19173/irrodl.v19i1.3255

Koch, D., & Pistilli, M. (2015). *Analytics and gateway courses: Understanding and overcoming roadblocks to college completion.* [PowerPoint slides]. Inside Higher Ed. https://www.insidehighered.com/sites/default/server_files/files/Analytics%20and%20Gateway%20Courses%20PPt.pdf

Laerd Statistics. (2017). *Binomial logistic regression using SPSS Statistics*. https://statistics.laerd.com/

Lee, D., & Combes, N. (2020). The effect of online core course enrollment on student success: The case of the University System of Georgia. *American Journal of Distance Education 34*(4), 260–279. https://doi.org/10.1080/08923647.2020.1768817

Miles, B., Sorgen, C. H., & Zinskie, C. D. (2021). Using an outsourced online tutoring service to promote success in online composition courses. *TechTrends, 65*, 743–749. https://doi.org/10.1007/s11528-021-00612-w

Millea, M., Wills, R., Elder, A., & Molina, D. (2018). What matters in college student success? Determinants of college retention and graduation rates. *Education*, *138*(4), 309–322.

Moberg, E. (2010). *The college writing center: Best practices, best technologies* [Online Submission]. ERIC. https://eric.ed.gov/?id=ED508644

Montelongo, R. (2019). Less than/more than: Issues associated with high-impact online teaching and learning. *Administrative Issues Journal: Connecting Education, Practice, and Research*, *9*(1), 68–79. https://doi.org/10.5929/9.1.5

National Census of Writing. (2017). Swarthmore University.

    https://writingcensus.swarthmore.edu/

National Center for Education Statistics. (2022). Postbaccalaureate Enrollment. *Condition of*

    Education. U.S. Department of Education, Institute of Education Sciences.

    https://nces.ed.gov/programs/coe/indicator/chb

Newton, F. B., & Ender, S. C. (Eds.). (2010). *Students helping students: A guide for peer*

    educators on college campuses (pp. xi-xvii). Jossey-Bass.

Pascarella, E. T., & Terenzini, P. T. (2005). *How college affects students: A third decade of*

    *research (*Vol. 2). Jossey-Bass.

Perry, C. J., Lausch, D., McKim, C. A., & Weatherford, J. (2020). Knowledge, use, and

    perceived value of university student services: International and domestic student

    perceptions. *Journal of International Students*, *10*(3), 613–628.

    https://doi.org/10.32674/jis.v9i4.269

Pfrenger, W., Blasiman, R. N., & Winter, J. (2017). "At first it was annoying": Results from

    requiring writers in developmental courses to visit the writing center. *Praxis: A Writing*

    Center Journal, 15(1). https://www.praxisuwc.com/pfrenger-blasiman-and-winter-151

Pike, G. R., Hansen, M. J., & Childress, J. E. (2014). The influence of students' pre-college

    characteristics, high school experiences, college expectations, and initial enrollment

    characteristics on degree attainment. *Journal of College Student Retention: Research,*

    Theory & Practice, *16*(1), 1–23. https://doi.org/10.2190/CS.16.1.a

Politis, J., & Politis, D. (2016). The relationship between an online synchronous learning

    environment and knowledge acquisition skills and traits: The blackboard collaborate

experience. *Electronic Journal of E-Learning, 14*(3), 204-222.

https://www.learntechlib.org/p/175450/

Reinheimer, D., & McKenzie, K. (2014). The impact of tutoring on the academic success of

undeclared students. *Journal of College Reading and Learning, 41*(2), 22–36,

https://doi.org/10.1080/10790195.2011.10850340

Rendleman, E., Livingston, J., & Rose, S. (2019). A "quick-fire" study on effective frequency

thresholds for mandatory writing center visits. *Southern Discourse in the Center: A*

Journal of Multiliteracy and Innovation, 23(2), 42-54.

https://csuepress.columbusstate.edu/bibliography_faculty/3032/

Rennar-Potacco, D., Orellana, A., & Salazar, A. (2017). Innovations in academic support:

Factors influencing student adoption of synchronous videoconferencing for online

support in high-risk STEM courses. *Quarterly Review of Distance Education*, *18*(3), 1–

17. https://nsuworks.nova.edu/fse_facarticles/474/

Richardson, J. T. E. (2009). Face-to-face versus online tutoring support in humanities courses in

distance education. *Arts and Humanities in Higher Education, 8*(1), 69–85.

https://doi.org/10.1177/1474022208098303

Riley, E. (2019). Exploring strategies to enhance scholarly writing for RN-BSN students using

an online tutorial. *Teaching and Learning in Nursing*, *14*(2), 128–134.

https://doi.org/10.1016/j.teln.2018.12.011

Roberts, S. T., & Goss, G. (2009). Use of an online writing tutorial to improve writing skills in

nursing courses. *Nurse Educator, 34*(6), 262–265.

https://doi.org/10.1097/NNE.0b013e3181bc740d

Russo-Gleicher, R. J. (2013). Qualitative insights into faculty use of student support services with online students at risk: Implications for student retention. *Journal of Educators Online*, *10*(1). doi:10.9743/JEO.2013.1.4

Salem, L. (2016). Decisions... decisions: Who chooses to use the writing center? *The Writing Center Journal, 35*(2) 147-171. https://www.jstor.org/stable/43824060

Sanford, N. (1967). *Where colleges fail: A study of the student as a person*. Jossey-Bass.

Scott-Clayton, J., Crosta, P. M., & Belfield, C. R. (2014). Improving the targeting of treatment: Evidence from college remediation. *Educational Evaluation and Policy Analysis, 36*(3), 371–393. https://doi.org/10.3102/0162373713517935

Seery, K., Barreda, A. A., Hein, S. G., & Hiller, J. L. (2021). Retention strategies for online students: A systematic literature review. *Journal of Global Education and Research, 5*(1), 72-84. https://www.doi.org/10.5038/2577-509X.5.1.1105

Shoulders, C., Simmons, L. M., & Johnson, D. M. (2020). Pre-entry attributes and freshman satisfaction, grades, and engagement as predictors of six-year college graduation. *College Student Journal*, *54*(3), 327–338.

Smith, C. D. (2018). *Synchronous online peer tutoring via video conferencing technology: An exploratory case study*. [Unpublished doctoral dissertation]. Boise State University. https://scholarworks.boisestate.edu/td/1454/

Tabachnick, B. G., & Fidell, L. S. (2014). *Using multivariate statistics* (6th ed.). Pearson Education.

Tani, M., Gheith, M. H., & Papaluca, O. (2021). Drivers of student engagement in higher education: A behavioral reasoning theory perspective. *Higher Education*, *82*(3), 499–518. https://doi.org/10.1007/s10734-020-00647-7

Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research, 45*(1), 89–125. https://doi.org/10.3102/00346543045001089

Tinto, V. (1987). *Leaving college: Rethinking the causes and cures of student attrition*. The University of Chicago Press.

Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition* (2nd ed.). The University of Chicago Press.

Tinto, V. (2012). *Completing college: Rethinking institutional action*. The University of Chicago Press.

Topping, K. J. (1996). The effectiveness of peer tutoring in further and higher education: A typology and review of the literature. *Higher Education*, *32*(3), 321–345. https://doi.org/10.1007/BF00138870

Tseng, H., Kuo, Y.C., & Walsh, E. J. (2020). Exploring first-time online undergraduate and graduate students' growth mindsets and flexible thinking and their relations to online learning engagement. *Educational Technology Research & Development*, *68*(5), 2285–2303. https://doi.org/10.1007/s11423-020-09774-5

Tutor.com. (2020). *Our company*. https://www.tutor.com/about-us

Webber, D. A., & Ehrenberg, R. G. (2010). Do expenditures other than instructional expenditures affect graduation and persistence rates in American higher education? *Economics of Education Review*, *29*(6), 947–958. https://doi.org/10.1016/j.econedurev.2010.04.006

Watson, R., & Watson, S. (2007). An argument for clarity: What are learning management systems, what are they not, and what should they become? *TechTrends, 51*(2), 28-34. https://doi.org/10.1007/s11528-007-0023-y

Williams, J. D., & Takaku, S. (2011). Help seeking, self-efficacy, and writing performance among college students. *Journal of Writing Research*, *3*(1), 1–18. https://www.researchgate.net/publication/234118813_Help_Seeking_Self-Efficacy_and_Writing_Performance_among_College_Students

Williams, J. D., Takaku, S., & Bauman, K. (2006). Effects of self-regulatory behavior on ESL student writing. *Tohoku Psychologia Folia, 65,* 24–36.

Wingate, U. (2010). The impact of formative feedback on the development of academic writing. *Assessment and Evaluation in Higher Education*, *35*(5), 519–533. https://doi.org/10.1080/02602930903512909

Wolfe, J., & Griffin, J. A. (2012). Comparing technologies for online writing conferences: Effects of medium on conversation. *The Writing Center Journal, 32*(2), 60-92. https://www.jstor.org/stable/43442393

Xu, Y., Hartman, S., Uribe, G., & Mencke, R. (2001). The effects of peer tutoring on undergraduate students' final examination scores in mathematics. *Journal of College Reading and Learning*, *32*(1), 22–31. https://doi.org/10.1080/10790195.2001.10850123

Yu, Z. (2021). The effects of gender, educational level, and personality on online learning outcomes during the COVID-19 pandemic. *International Journal of Educational Technology in Higher Education, 18*, Article 14. https://doi.org/10.1186/s41239-021-00252-3

Zamecnik, A., Kovanović, V., Joksimović, S., Liu, L. (2022). Exploring non-traditional learner motivations and characteristics in online learning: A learner profile study. *Computers and Education: Artificial Intelligence, 3.* https://doi.org/10.1016/j.caeai.2022.100051

Zhang, W., & Bray, M. (2020). Comparative research on shadow education: Achievements, challenges, and the agenda ahead. *European Journal of Education, 55*(3), 322-341. https://doi.org/10.1111/ejed.12413

Zusho, A., Karabenick, S. A., Rhee Bonney, C., & Sims, B. C. (2007). Contextual determinants of motivation and help seeking in the college classroom. In R. P. Perry & J. C. Smart (Eds.), *The scholarship of teaching and learning in higher education: An evidence-based perspective* (pp. 611–659). Springer. https://doi.org/10.1007/1-4020-5742-3_14

APPENDIX A

INSTITUTIONAL REVIEW BOARD APPROVAL

GEORGIA SOUTHERN UNIVERSITY
RESEARCH INTEGRITY

To: Miles, Brett

From: Georgia Southern Institutional Review Board

Approval Date: February 1, 2023

Subject: Institutional Review Board Exemption Determination - Limited Review

The following protocol involves activities that do not require full approval by the Institutional Review Board (IRB) according to federal guidelines.

Protocol #:   H23205

Title: Relationship Between Usage of an Online Tutoring System and Online Course Success

According to the Code of Federal Regulations Title 45 Part 46, your research protocol is determined to be exempt from full review under the following exemption category(s):

Review Type: E4

Exemption 4 Secondary research uses of identifiable private information or identifiable biospecimens, if at least one of the following criteria is met: The identifiable private information or identifiable biospecimens are publicly available; Information, which may include information about biospecimens, is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained directly or through identifiers linked to the subjects, the investigator does not contact the subjects, and the investigator will not re-identify subjects.

Any data use agreement or agreement change required by the data owner must be supplied to the IRB prior to execution for review. This approval is contingent upon researcher compliance with the conditions of the data use agreement (where required) and current institutional data security policy.

Therefore, as authorized in the Federal Policy for the Protection of Human Subjects, I am pleased to notify you that the Institutional Review Board has approved your proposed research **with the understanding that you will abide by the following conditions:**

No COVID Safety Plan   No in person procedures were included in this protocol.
Incentives: No monetary incentives are approved for this protocol.

Special Conditions: You are approved to conduct research at the following schools for which you have obtained letters of cooperation:
- The University System of Georgia
Additional schools may be added to this study by submitting additional letters of cooperation.

Any alteration in the terms or conditions of your involvement may alter this approval. Therefore, as authorized in the Federal Policy for the Protection of Human Subjects, I am pleased to notify you that your research, as submitted, is exempt from IRB Review. No further action or IRB oversight is required, as long as the project remains the same. If you alter the project, it is your responsibility to notify the IRB and acquire a new determination of exemption. Because this project was determined to be exempt from further IRB oversight, this project does not require an expiration date.

APPENDIX B

USG ECAMPUS LETTER OF COOPERATION

ecampus
UNIVERSITY SYSTEM OF GEORGIA

1601 MAPLE STREET, CARROLLTON, GA
30118 1-855-936-2567 | ECAMPUS.USG.EDU

January 26, 2023

Human Subjects - Institutional Review Board
Georgia Southern University
P.O. Box 8005
Statesboro, GA 30460

To Whom It May Concern:

Brett Miles has requested permission to collect research data from USG eCampus students in USG eCore ENGL 1101, ENGL 1102, MATH 1001, MATH 1101, MATH 1111, MATH 1113, and MATH 1501 courses for her dissertation research study entitled *Relationship between Usage of an Online Tutoring System and Online Course Success*. I have been informed of the purposes of the study and the nature of the research procedures. I have also been given an opportunity to ask questions of the researcher.

The data requested includes student final grade data, student demographic data, Tutor.com tutoring usage, and student survey data regarding their experience(s) with the tutoring service. The data can be provided to the researcher without parental permission under the University System of Georgia Family Educational Rights and Privacy Act (FERPA) policy. The data will be provided to the researcher without student names, ID numbers, or other identifiers.

As a representative of USG eCampus, I am authorized to grant permission to have the researcher utilize data from USG eCore. Brett Miles is also permitted to collect research data at our educational offices.

If you have any questions, please contact me at jhuett@ecampus.usg.edu.

Sincerely,

Dr. Jason Huett
Dean

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