THE RELATIONSHIP BETWEEN HIGH-IMPACT EDUCATIONAL PRACTICES (HIPS) AND INSTITUTIONAL INTEGRATION AND PERSISTENCE: A PREDICTIVE-CORRELATIONAL DESIGN

by

Amy O'Dell

Liberty University

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Philosophy

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ABSTRACT

The purpose of this quantitative, predictive-correlational research study was to examine how well a linear combination of predictor variables, including course structure, is able to predict the levels of integration and rates of reenrollment among students at a regional, comprehensive university in the southwest. Higher education has a problem with attrition. Approximately 50% of undergraduates who begin their post-secondary education leave without completing a degree. Innovative classroom techniques, like high-impact practices (HIPs), may be a way to reduce student attrition. This study sought to investigate the affect that a unique HIP has on students' levels of integration and rate of re-enrollment. The sample was comprised of 287 undergraduate students enrolled in a general education government course during the fall 2023 semester. Data collection took place in three phases. The first two phases involved pre-test and post-test surveys taken at the beginning and end of the semester, respectively, followed by the third phase when re-enrollment data was collected for each participant. The survey compiled demographic data as well as responses to 30 prompts from the Institutional Integration Scale, measuring students' levels of integration at the institution. Multivariate and binomial regression did not find a statistically significant relationship between HIP course structure and integration or re-enrollment; however, the results raised additional questions about the applicability of Tinto's model to late departure students and whether the influence of HIPs on student integration levels require time to manifest.

Keywords: high-impact practice, social integration, academic integration, student dropout, retention.

Dedication

As I reflect on the journey that has led me to this moment, I am overwhelmed with gratitude for my family. Their unwavering support, encouragement, and love have been a source of inspiration and encouragement, most especially, my husband, whose belief in me never wavered, even when self-doubt threatened to dim my resolve. His words of encouragement, patience, and unwavering support sustained me through the long nights of research and writing. Thank you, from the depths of my heart, for believing in me every step of the way.

"The end of a matter is better than its beginning, and patience is better than pride." Ecclesiastes 7:8 (NIV)

Acknowledgments

I extend my deepest gratitude to Dr. David Gorman and Dr. Michelle Barthlow, whose valuable contributions and constructive criticisms have played a pivotal role in refining this dissertation. Your expertise, discerning eye, and commitment to scholarly rigor have challenged me to think critically and to strive for excellence in every aspect of my research.

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List of Abbreviations

Department of Education (DOE)

Grade point average (GPA)

High-impact practice (HIP)

Institutional Integration Scales (IIS)

National Center for Education Statistics (NCES)

National Survey of Student Engagement (NSSE)

CHAPTER ONE: INTRODUCTION

Overview

The purpose of this quantitative, predictive-correlational study was to determine if a predictive relationship exists between a combination of predictor variables (course structure, gender, race, high school aptitude, socioeconomic status) and students' levels of institutional integration and rate of re-enrollment at a southwestern university. Many of the predictor variables can be found in the extent literature; however, this study added a new predictor variable: course structure. Here, course structure refers to the pedagogical use of high-impact instructional practices (HIPs) in contrast to the more traditional didactic lecture (non-HIPs). Chapter One begins with a historical summary of the topic of student dropout before transitioning to a more recent line of research examining how pedagogical practices may affect student dropout. This is followed by the theoretical background section. Chapter One continues with the problem statement, purpose statement, and significance of this study. The final sections of Chapter One outline the research questions and the definitions pertinent to this study.

Background

Student dropout, also referred to as student attrition or student departure, is often defined and measured in one of two ways. First, dropouts are reported as the percentage of students who enter higher education but fail to successfully complete a credential within 150% of the normal completion period (NCES, 2022a). For example, according to the National Center for Education Statistics (NCES), 36% of the students who began a college education at a 4-year institution in 2014 failed to finish their degree within 6 years (NCES, 2022a). Similarly, at 2-year institutions, 66% of students who entered in 2017 failed to complete their program of study within 3 years (150% of the proscribed period) (NCES, 2022a). A second measure of attrition is the percentage

of students who enter higher education in the fall but do not return the following fall to the same institution. This measure of attrition varies widely depending upon the institution's research status and degree of selectiveness; however, on average, among first-time students who entered college in 2019, 18% of students at 4-year institutions (public and private) and 39% of students at 2-year institutions did not return to the same institution the following fall (NCES, 2022a). By combining these fall-to-fall retention data with NCES enrollment figures for 2019 (NCES, 2022b), it is possible to estimate that over 4.1 million first-time, full-time students failed to return to their initial institution after the end of their freshman year. Thus, both measures of student attrition support the conclusion that millions of students each year leave higher education without a credential or degree.

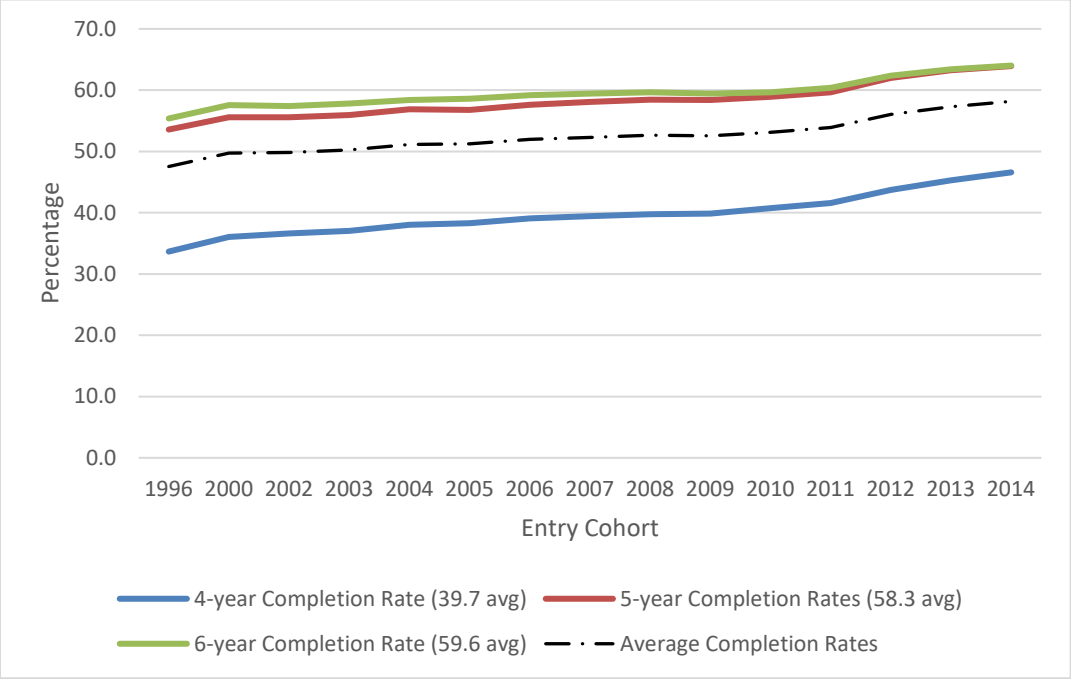
Failing to earn a degree is associated with a number of financial and personal costs. Brown (2021) surveyed 1000 college dropouts and found that they left college with approximately $14,000 in student loans. Brown also found that 53% of those surveyed were not currently making payments on their student loans and 46.5% were in default. In addition to financial costs, research has identified correlations between an individual's educational level and health status. The U.S. Department of Health and Human Services conducts an annual survey on the health of the nation. In 2017, the department found that respondents who had earned some college credits but lacked a bachelor's degree had a higher risk of heart disease and stroke, were more likely to smoke, and were less likely to participate in regular exercise (National Center for Health Statistics, 2017). Finally, the cost of attrition also has an economic impact. According to the Bureau of Labor Statistics (2022), individuals without a bachelor's degree are twice as likely to be unemployed as those with a college degree.

Historical Overview

Student attrition in higher education is not a recent problem. Tinto (1982b) reasoned that the national degree completion rate was about 45% between 1880 and 1980 (assuming 4 years to degree completion). Using data from the Integrated Postsecondary Education Data System, Figure 1 extrapolates national 4-year degree completion rates over a period of 18 years (1996-2014) as ranging from 33.7% to 46.6% for first-time, full-time students at 4-year degree granting institutions (NCES, 2021). When 5- and 6-year completion rates are included in the calculation, the degree completion rate increases 12.8% to an average of 52.5%, meaning approximately half the students who enter a 4-year degree granting institution, leave that institution without degree. These data support Tinto's (1982) assertion that "attrition has been a surprisingly stable feature of the higher educational enterprise" (p. 693) for almost 150 years.

Figure 1

Degree Completion Rates 1996-2014



Student attrition in higher education has spawned almost 100 years of educational research (Braxton et al., 2007). Braxton (2000) identified John B. Johnson's 1926 article, which examined the use of intelligence tests to predict college success, as one of the earliest studies in student dropout (Johnson, 1926). The focus of Johnson's (1926) work lay in establishing cut-off levels for various indices, which could be applied by college admission professionals to select applicants possessing the aptitude to complete a college degree. During the study, Johnson identified some students who exceeded the threshold indices for college ability but elected to voluntarily withdraw (dropout). Johnson recommended further research aimed at isolating such students so that special institutional efforts might be directed toward supporting their retention and success.

Almost 50 years later, Astin (1975) acknowledged the growing body of literature on student attrition when he quipped, "dropping out of college is a little like the weather: something everyone talks about but no one does anything about" (p. 1). Astin and his academic contemporaries helped address this deficit by introducing several theoretical perspectives to explain student attrition. Initially, theories on student attrition tended to focus on student characteristics, attributes, and expectations (Tinto, 1993). By the 1970s and 80s, theories based on the social, economic, and organizational perspectives contributed to the body of knowledge surrounding student attrition (Braxton et al., 1997; Tinto, 1993). None of these theories, however, achieved the "near-paradigmatic status" (Braxton, 2000, p. 2) of Vincent Tinto's (1975) theory of student departure.

First published in 1975, Tinto's theory is a longitudinal model that attempts to depict the interactions between an individual and an institution as a temporal process which culminates in a student's decision to drop out. Tinto (1975) believed that student interactions within the

academic and social systems of the institution directly influenced the student's level of institutional integration. Integration, Tinto argued, subsequently affected the level of commitment that the student felt toward his or her goals of obtaining a degree and graduating from a particular institution. Tinto posited that individuals who manifest higher levels of institutional integration are less likely to dropout.

Much of extant literature on student attrition has explored the construct of integration. In Tinto and Cullen's (1973) original model, as well as Tinto's (1975, 1993) revised models, Tinto depicted integration as consisting of two separate components: social integration and academic integration, with social integration theoretically influenced by the social system of the institution while academic integration was influenced by the academic system of the institution; however, research has suggested a more complex relationship. Pascarella and Terenzini (1983) found that social and academic integration had varying effects on persistence based upon gender. Additionally, higher levels of academic integration were found to compensate for lower levels of social integration, suggesting a more reciprocal relationship. In another study, Stage (1989) observed that academic integration was a statistically significant predictor of social integration among men, whereas among women, social integration was a positive predictor of academic integration. Tinto (1993) believed these findings highlighted "the varying academic and social attributes of institutions and the students they serve" (p. 169). Nevertheless, Tinto edited the model in 1997, graphically linking social and academic integration with an arrow to depict this interrelationship.

Tinto (1997) also made an important modification to the institutional representation within his model. Prior to 1997, the model depicted institutions as two distinct systems: academic and social. Tinto theorized that students obtain acceptance into each system via unique,

indicators such as grades (academic) and peer-relationships (social). In the 1997 revisions, Tinto eliminated the indicators and overlaid the two systems with a third box containing the words, "classes, labs, studios" (p. 615). The new box emphasized the importance of the classroom as the intersection of the institution's academic and social systems. Tinto further described the classroom as the "crossroad where the social and the academic meet" (Tinto, 1997, p. 599). This emphasis on the classroom as an essential element of student integration has formed the basis of Tinto's writings since that time.

George Kuh was also interested in postsecondary classroom practices, but for a different reason. As Director of the Indiana University Center for Postsecondary Research, Kuh (2008) believed that effective educational practices were a reliable measure of the quality of a college or university. Kuh and his colleagues combined research on effective educational practices, student effort, and involvement into a new construct: student engagement, which became the bases for the National Survey of Student Engagement (NSSE). Kuh (2003) postulated that higher levels of student engagement were indicative of a higher quality institution.

Kuh (2008) highlighted a group of ten empirically-backed educational practices in the publication, "High-Impact Educational Practices: What They Are, Who Has Access to Them, and Why They Matter" published by the Association of American Colleges & Universities (AAC&U). The high-impact practices (HIPs) included first-year seminars, undergraduate research, internships, and study abroad among others. Kuh (2008; Kuh & O'Donnell, 2013) selected these HIPs based on NSSE data showing that these effective educational practices consistently increased students' self-reported learning and engagement. While Kuh (2008) may have bestowed on these practices a contemporary, new moniker, all the HIPs identified by Kuh

were built on decades-old principles such as active learning, collaborative inquiry, and student-faculty interaction (Chickering & Gamson, 1987).

High-impact practices have many benefits. Some researchers focused on outcomes like student achievement (Kilgo et al., 2014), civic participation (Myers et al., 2019), and student engagement (Zhao & Kuh, 2004). Others, like Andrews (2018) and McDaniel and Van Jura (2020) examined the impact of HIPs on student dropout. They found that students who participated in multiple HIPs were more likely to complete a bachelor's degree. Provencher and Kassel (2019) observed that participation in multiple HIPs had the ability to predict those sophomores who would return for their junior year. It was amid these mostly positive findings related to HIPs that Johnson and Stage (2018) initiated their study of the relationship between HIPs and graduation rates at 4-year public institutions in the United States. Johnson and Stage collected data on 101 institutions. They subjected the data to multiple regression models and found that graduation rates were no better at institutions offering more HIPs than institutions that did not, which raises the question: Do HIPs increase student retention and graduation? In other words, are HIPs an effective way to reduce student dropout?

Society-at-Large

While student attrition directly and negatively impacts students, the negative repercussions of attrition from higher education also affect states, institutions, and tax payers. In a 2011 study funded by the Gates Foundation, the American Institutes for Research found that almost 1 billion dollars in state expenditures (grants and state appropriations) during the 2008-2009 academic year went to first-time, full-time community college students who dropped out before their second year of college (Schneider & Yin, 2011). The Institute also found that over a 5-year period, states disbursed almost 4 billion dollars to community college students who left

school without a degree (Schneider & Yin, 2011). In addition to taxpayers, colleges and universities also suffer from student attrition. Aside from the lost tuition dollars, some states now have performance funding formulas that tie state appropriations to graduation rates; hence, schools lose state funding when students drop out (Marcus, 2022). Raisman (2013) calculated the cost of attrition for 1,669 institutions and estimated an average loss per school of just over $9 million during the 2010-2011 school year or an almost $16.5 billion aggregate loss.

Theoretical Background

The theoretical framework for this study is Tinto's theory of student departure (1975, 1993, 1997). Tinto (1997) designed a longitudinal model consisting of 8 stages. The first stage represents the attributes with which students enter higher education (pre-entry attributes), including family background, skills and abilities, and prior academic experiences. Although these pre-entry attributes were found to have a minimal direct effect on persistence, they wield greater influence indirectly through their effect on the model's second stage: pre-entry goals and commitments (Pascarella & Terenzini, 1983). A student's pre-entry goals and commitments refer to how committed an individual student is to earning a degree and the student's level of commitment to a particular institution. Tinto (1997) theorized that a student's pre-entry attributes and pre-entry goal commitments are brought to bear as students enter the third stage of the model.

The third stage consists of a student's interactions with the academic and social systems of the institution (institutional experiences). Tinto (1975, 1993) depicted the social and academic systems as two separate elements each further defined by various aspects of institutional life into which a student must integrate. In Tinto's 1975 version of the model, he identified "grade performance" and "intellectual development" (p. 95) as the necessary aspects of the academic

system. Grades are a measure of integration within the academic system because they are the most direct evidence of one's ability to conform to expectations and meet established institutional values and standards while intellectual development is a measure of a student's perception of the institution's capacity to provide personal enrichment (Tinto, 1975). When Tinto published a revised version of the model in 1993, he retained grades (academic performance) as a necessary aspect of the academic system but replaced intellectual development with faculty/staff interactions, foreshadowing his growing interest in classroom interactions as a key component of integration.

The social system was likewise defined by two areas of institutional life into which students must find acceptance. Tinto's (1975) earlier model identified these necessary aspects as "peer-group interactions" and "faculty interactions" (p. 95); however, once again, in the 1993 revisions, Tinto retained peer-group interactions as a necessary element but replaced faculty interactions with "extracurricular activities" (p. 114). Interestingly, in the 1997 version of the model, Tinto completely abandoned any attempt to define the necessary aspects of the social and academic systems. These changes seem to represent Tinto's ongoing struggle to uniquely define two systems that are at once separate while at the same time "invariably interwoven" (p. 109). One thing that did not change was Tinto's (1975, 1993, 1997) belief that students' institutional experiences (academic and social) could increase or decrease the levels of social and academic integration found in the fourth stage of the model.

Academic and social integration are key constructs in Tinto's (1993) theory and form the lynchpin of the remaining 4 stages of the model. Tinto argued that a student's level of institutional integration directly influenced the student's subsequent quality of academic effort (stage 5), which affected cognitive gains (stage 6). Additionally, Tinto posited that institutional

integration also directly impacted the student's post-entry goal commitments (stage 7). Thus, Tinto (1975, 1993, 1997) theorized that institutional experiences, which positively support both social and academic integration, have the potential to reduce student attrition. According to Tinto (1997), the classroom is the nexus of social and academic systems. Therefore, the classroom has the unique potential to enhance institutional integration by engaging students socially and academically at the same time. This synergy results in greater quality of effort, which leads to increased learning and a greater likelihood the student will remain enrolled at the institution.

Problem Statement

In 2017, 2.4 million students entered higher education. Six years later, almost a million of those students still had not completed a degree or certificate (National Student Clearinghouse Research Center, 2023). Hanson (2022) estimated that almost one fourth of all incoming college freshman in 2019 dropped out. She went on to conclude that there were two dropouts for every one postsecondary student enrolled in 2022. Among the negative outcomes faced by college dropouts are student loan default, higher rates of unemployment, and lower lifetime salaries (Brown, 2021; Bureau of Labor Statistics, 2022). Tinto and Cullen's (1973; Tinto, 1975; Tinto, 1997) model of student drop out provides a framework for understanding some of the variables that influence a student's decision to drop out. According to Tinto, the key variable is integration, and one of the most powerful influences on a student's level of integration is the student's classroom experiences.

In the last two decades researchers have successfully identified classroom experiences and pedagogies that help support and retain students. Dwyer (2017) found a positive correlation between student-faculty interactions and student intention to remain enrolled. Instructional techniques such as active learning (Braxton et al., 2008), collaborative learning (Loes et al.,

2017), supplemental instruction (Skoglund et al., 2018), and project-based learning approaches have also been shown to increase student retention (Vesikivi et al., 2020). High-impact practices are another group of instructional techniques that have shown some positive outcomes, but results of empirical studies have been mixed.

While the literature has suggested a possible link between HIPs and student retention or degree completion, the question of why remains unanswered. Based on Tinto's (1997) model, it seems plausible that HIPs create a classroom environment that increases the integration of those enrolled. This in turn motivates students to increase their quality of effort, leading to greater learning which positively influences a student's intention to remain enrolled and complete a credential. Only one preliminary report could be found that considered the relationship between HIPs and integration. Thacker Thomas et al. (2021) found increased integration among transfer students who participated in a pilot HIP study, but students participating in the study had not yet completed the full sequence of courses and did not engage with all aspects of the high-impact program. Consequently, their findings were encouraging but still preliminary. The problem is that the literature has not fully addressed the effect HIPs may have on measures of students' integration. Additionally, there is conflicting evidence regarding the influence that HIPs may have on student intent to re-enroll (Braxton, Milem, & Shaw Sullivan, 2000; Johnson & Stage, 2018).

Purpose Statement

The purpose of this quantitative, predictive-correlational study was to examine the predictive strength of a combination of predictor variables (course structure, gender, race, socioeconomic status, high school achievement, and pre-test integration scores) on measures of

integration and rates of reenrollment among undergraduate students enrolled in a government course at a midsize, comprehensive, regional university.

The predictor variables for RQ1 were course structure (HIP vs. non-HIP), pre-test integration scores, gender, race, socioeconomic status, and high school achievement. Courses utilizing HIP pedagogy are characterized by eight qualities:

- performance expectations set at appropriately high levels
- significant investment of time and effort by students over an extended period of time
- interactions with faculty and peers about substantive matters
- experiences with diversity
- frequent, timely, and constructive feedback
- periodic, structured opportunities to reflect and integrate learning
- opportunities to discover relevance of learning through real-world applications
- public demonstration of competence. (Kuh & O'Donnell, 2013, pp. 7-8).

The remaining predictor variables were drawn from extant literature on Tinto's (1975, 1997) model of student departure. Gender, race, socioeconomic status, and high school achievement appeared most consistently in the literature (Andrews, 2018; Braxton, Milem, & Shaw Sullivan, 2000; Loes et al., 2017; McDaniel & Van Jura, 2020; Pascarella & Terenzini, 1979; Stage, 1989; Stoecker et al., 1988; Terenzini & Wright, 1987a). Gender was defined as the student's legal gender or the gender assigned at birth (Lindqvist et al., 2021). Race was defined as the five categories established by the United States Office of Management and Budget in its Standards for the Classification of Federal Data on Race and Ethnicity (Revisions to the Standards, 1997): Black or African American, White, Asian, American Indian or Alaska Native, and Native Hawaiian or other Pacific Islander. Socioeconomic status was defined as a composite

score of household income and parents' levels of education (Andrews, 2018; McDaniel & Van Jura, 2020). High school achievement was defined as the student's self-reported high school grade point average (GPA).

The predictor variables for RQ2 were course structure (HIP vs. non-HIP), pre-and post-test integration scores, gender, socioeconomic status, and high school achievement. Race was removed as a predictor variable due to the small *n* in most categories.

There was one criterion variable for each research question. The first research question had the criterion of post-test integration score. Integration was defined by Tinto (1975, 1993) as the level of congruence (shared values) between the student and the institution and was measured as a continuous variable. The integration score will be measured using the Institutional Integration Scale (Pascarella & Terenzini, 1980). The criterion variable in the second research question is reenrollment status and is a categorical variable defined as the participant's decision to reenroll or not reenroll at the same institution the following semester.

Significance of the Study

Despite almost a century worth of research on student drop out, researchers do not fully understand what motivates students to drop out and others to persist (Tinto, 1993). While the literature has contributed in significant ways, Tinto acknowledges that his theory is incomplete and that much of the work remaining will be to provide institutions with the means to operationalize empirical findings to reduce drop out (Tinto, 1982). Tinto's model was originally designed to highlight the role that institutions play in a student's decision to drop out, and in so doing, to uncover actionable steps that institutions could take to retain students (Tinto, 1982). Research focusing on a student's interactions within a particular institution benefits the field of

educational scholarship at large by testing the claims made by Tinto's (1975, 1993, 1997) theory of student departure (Johnson & Stage, 2018; Kuh & Kinzie, 2018).

In addition to the theoretical benefits, research testing the efficacy of classroom pedagogies and their link to student dropout will benefit administrators faced with deciding where to spend limited institutional resources. Since the economic recession of 2008, state funding of public higher education has declined in all but six states (National Education Association, 2022). Although some states increased funding in the decade that followed the recession, only half of the states returned to pre-recessionary funding levels after adjusting for inflation (National Educational Association, 2022). In addition to declining state appropriations, higher education enrollment fell 9% between 2009-2020 (NCES, 2022a). These challenges have constricted spending and prompted administrators to demand empirical support before authorizing funding for new institutional initiatives.

Restricted spending and tighter institutional budgets may disproportionately impact more vulnerable students. Kuh and O'Donnell (2013) found that HIPs are not equally accessible to all students; first-generation students and minority students are less likely to participate in HIPs than White students. One reason for the disparity may be that some HIPs, like study abroad or internships, require students to pay out-of-pocket or commit time that would otherwise be spent on paid employment. Program administrators that want to expand HIPs and increase participation of underrepresented groups will find themselves facing an increasingly competitive funding process. This study will provide faculty and administrators with empirical data to make informed decisions about program efficacy and institutional impact, particularly among students from underrepresented groups, which would support institutional goals related to retention and resource management.

Research Question(s)

RQ1: How accurately can post-test integration scores be predicted from a linear combination of course structure, pre-test integration scores, gender, race, socioeconomic status, and high school achievement?

RQ2: How accurately can reenrollment status [binary] be predicted from a linear combination of course structure, pre- and post-test integration scores, gender, socioeconomic status, and high school achievement?

Definitions

1. *Attrition* – also described as "departure" or "dropout" refers to a student's voluntary decision to leave an institution of higher education (Braxton et al., 2007).
2. *Integration* – A construct of Tinto's (1975, 1993) interactional theory of student departure that refers to the degree of congruence between the students' values and those of the institution and the sufficiency of interactions between the student and faculty, staff, and peers. Tinto (1975, 1993) further subdivided this construct into social integration and academic integration.
3. *High-impact practice* – Teaching pedagogy that include the following characteristics: "performance expectations set at appropriately high levels," "significant investment of time and effort by students over an extended period of time," "interactions with faculty and peers about substantive matters," "experiences with diversity," "frequent, timely, and constructive feedback," "periodic, structured opportunities to reflect and integrate learning," "opportunities to discover relevance of learning through real-world applications," and "public demonstration of competence" (Kuh & O'Donnell, 2013, pp. 7-8).

4. *Persistence* – also referred to as "retention" is defined as "continued enrollment of students, usually fall to fall re-enrollment" (Braxton et al., 2007); however, for purposes of this study persistence is defined as re-enrollment in spring 2024, the first long semester following the semester under study.

CHAPTER TWO: LITERATURE REVIEW

Overview

In preparing to study the predictive impact of course structure on integration and reenrollment, a systematic review of the literature was conducted to explore the origins of high-impact educational practices and their place within the broader framework of persistence research. This chapter begins by introducing Tinto's (1975, 1993, 1997) theory of student departure which forms the theoretical framework for this study. This is followed by a synthesis of recent literature in student involvement, student effort, and the impact of the higher education reform movement on the development of effective educational practices. Finally, the seven principles of good undergraduate teaching developed by Chickering and Gamson (1987) and their relationship to high-impact practices will be presented. To conclude, a gap in the literature will be identified.

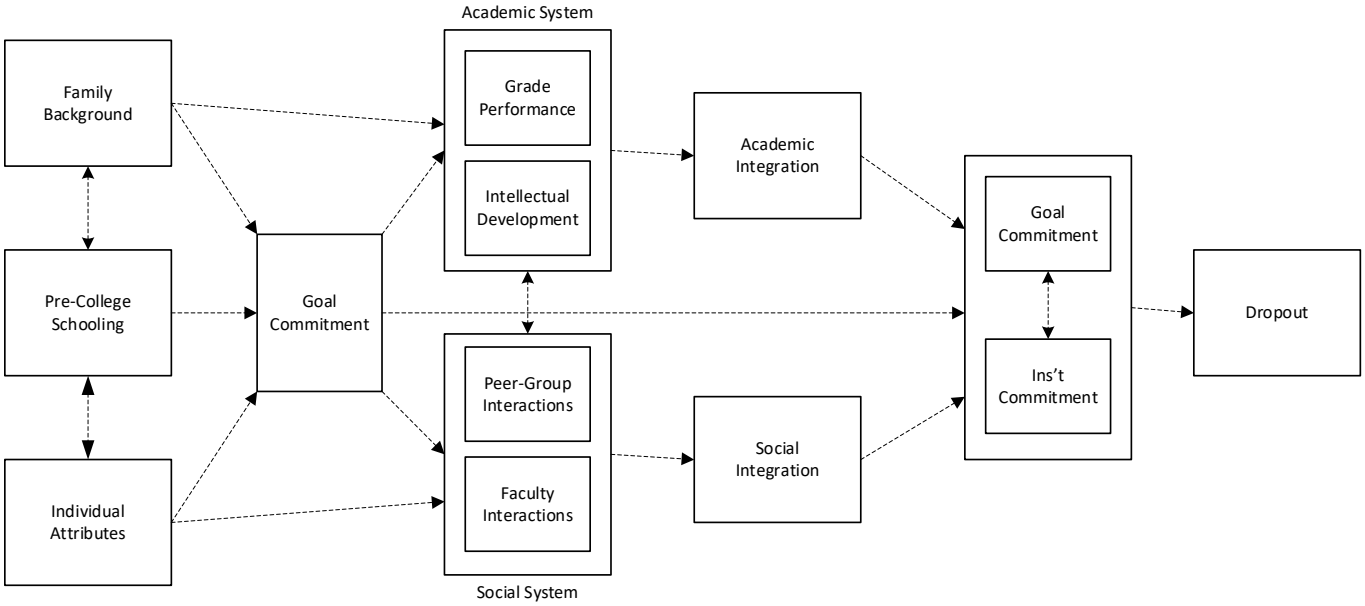
Theoretical Framework

The theoretical framework for this study was Vincent Tinto's (1975, 1993, 1997) theory of student departure. Tinto's self-described "model" (WGU labs, 2021, 3:59) originated as part of a collaboration with John Cullen. Tinto and Cullen were doctoral students together at the University of Chicago. In the late 1960s, the Office of Education, as it was known at that time, (hereinafter DOE) approached the university to contract for a report on student dropout (DOE report; Tinto & Cullen, 1973; WGU labs, 2021). Tinto and Cullen (1973) accepted the commission and delivered a report to the DOE that contained a summary of the literature on postsecondary student dropout and a theoretical model that attempted to explain the body of literature available at that time.

Figure 2 shows the original model contained in the DOE report. Consistent with the extant literature at the time, the model addressed the common background characteristics or pre-existing attributes of entering college students. These qualities, according to Tinto and Cullen (1973), affected the level of commitment possessed by precollege students. Once admitted, interactions and experiences with peers, faculty, and the institution influenced levels of academic integration and social integration among students which likewise increased or decreased levels of commitment to the goal of obtaining a degree and to the institution itself, affecting the decision to drop out or remain.

Figure 2

Tinto and Cullen's (1973) Model of Student Departure

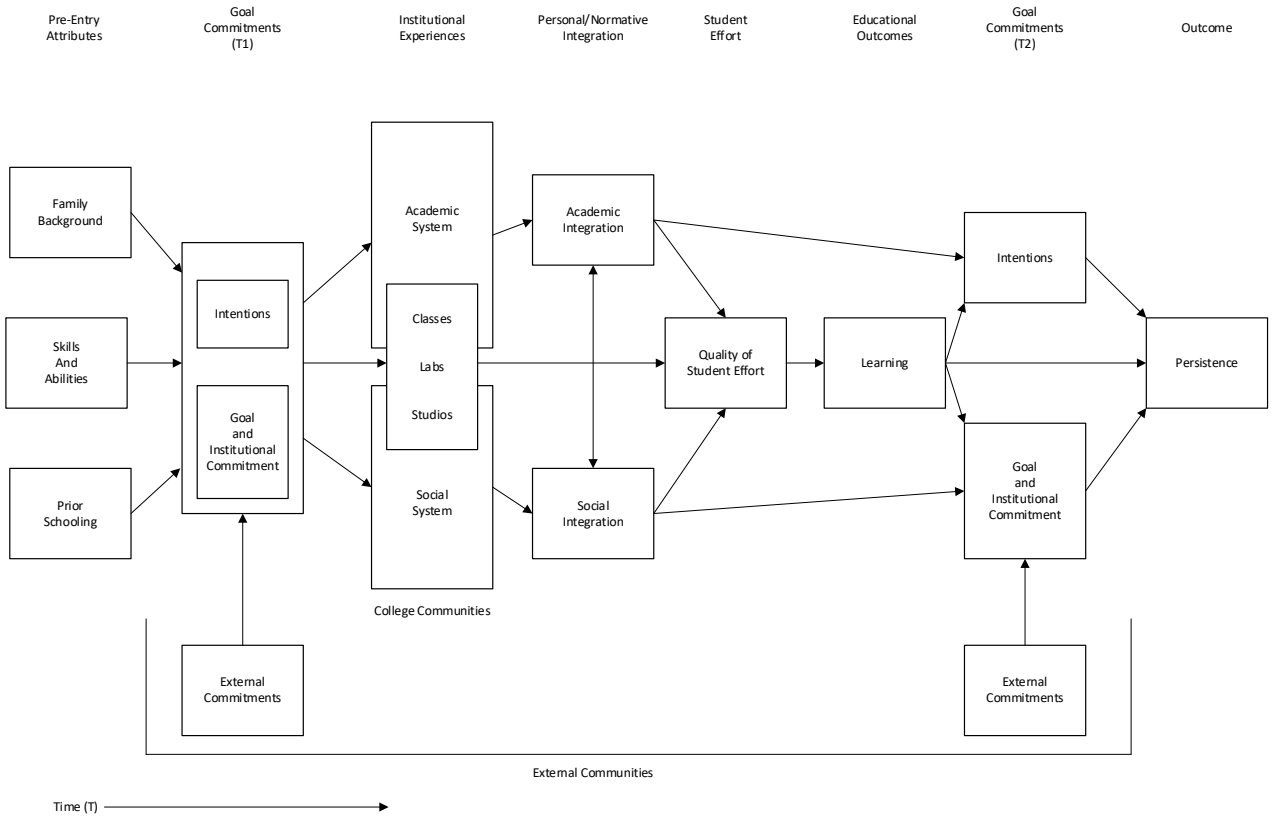


From "Dropout in higher education: A review and theoretical synthesis of recent research," by V. Tinto & J. Cullen, 1973, Office of Planning, Budgeting, and Evaluation, Department of Health, Education, and Welfare, Contract OEC-0-73-1409, p. 42. ERIC. https://eric.ed.gov/?id=ED078802. In the public domain.

Over the next 20 years, Tinto's own research combined with the persistence scholarship of his contemporaries resulted in two marked changes in the model: the inclusion of external commitments as a new factor and greater emphasis on the impact of teaching and learning on the construct of integration. While the major framework of Tinto and Cullen's (1973) model remained the same, the most recent iteration of Tinto's (1997) longitudinal model, seen in Figure 3, reflects the sociological and demographical changes in higher education over the two decades following its first publication.

Figure 3

Tinto's (1997) Model of Student Departure



From “Classrooms as communities: Exploring the educational character of student persistence,” by V. Tinto, 1997, *Journal of Higher education,* 68(6), p. 615. Copyright 1997 by Ohio State University Press. Reprinted with permission (Appendix C).

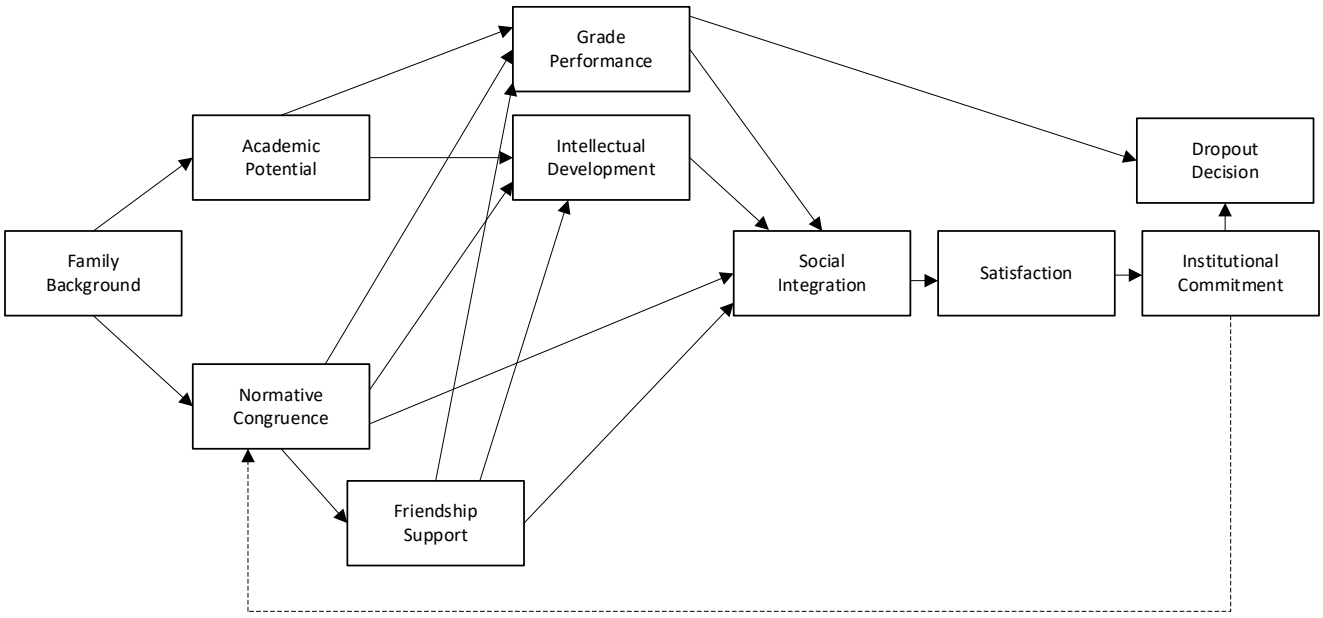
In many ways, the structure of Tinto’s (1997) model reflects the corresponding development of persistence as a field of study during the last quarter of the 20th century. The section that follows will briefly review the underlying origins of Tinto’s model before providing a review of the extant literature to date using the model itself as a framework beginning with pre-entry attributes, then goal commitment, external commitments, institutional experiences, integration, student effort, and educational outcomes.

Origins of Tinto’s Model

In the introduction to the DOE report, Tinto and Cullen (1973) acknowledged the work of William Spady, a fellow graduate student at the University of Chicago, as “greatly influential” to the development of the model (Tinto & Cullen, 1973, p. v). According to Tinto, he attended a presentation by Spady at the University of Chicago wherein Spady introduced Émile Durkheim’s theory of suicide to explain dropout among freshman at the University of Chicago (WGU labs, 2021). Spady used Durkheim’s concept of “integration” to explore the outcome for students struggling to integrate into the university culture (see Figure 4). In an interview with Spady more than three decades later, Hader (2011) reported that Spady was shocked by the acknowledgement in the DOE report. According to Hader, Spady claimed that Tinto “took my theoretical model, put his name on it, and did some kind of study on dropouts, and named it the Tinto model” (p. 41).

Figure 4

Spady (1971) A Theoretically Based Model of the Undergraduate Dropout Process



From "Dropouts from higher education: Toward an empirical model," by W. Spady, 1971, *Interchange*, 2(3), p. 39. Copyright 1971 by Kluwer Academic Publishers. Reprinted with permission (See Appendix D).

There are both similarities and differences between Spady's (1971) and Tinto and Cullen's (1973) models. Both authors recognized the influence of pre-entry attributes and the importance of institutional commitment. Additionally, both relied heavily on the construct of integration as derived from Durkheim's theory of suicide. Finally, both used their models to describe a complex, linear process which begins before a student is enrolled at college and ends with that student making the decision to stay or leave the institution.

There are also two notable differences between the models. First, Tinto surmised that the construct of integration is bifurcated (social and academic) to align better with what he perceived as a duality that exists in academia, while Spady followed Durkheim's lead and utilized a

singular concept of social integration. Second, Tinto envisioned the influence of goal commitment at two different points in his model. According to Tinto and Cullen (1973), students bring particular levels of commitment to the institution prior to admission (see Figure 3, Goal commitments T1). Then, after admission, the student's experiences at the institution affect that commitment in positive or negative ways subsequently impacting the student's decision to drop out. While it is clear that Spady's work greatly influenced Tinto, which he readily acknowledges, it is also clear that Tinto modified and expanded on Spady's work by using the major components of Durkheim's theory in his own explanation of student dropout.

Pre-Entry Attributes

Throughout the 1960s, the majority of research in the area of persistence looked at student dropout through a psychological lens (Tinto, 1993). Researchers using the psychological lens focused on students' "pre-entry attributes" (Tinto, 1993, p. 615). Their goal was to identify attributes that could predict those college students most likely to dropout from those likely to remain. Admissions policies based on students' pre-entry attributes had the potential to help institutions better allocate resources, manage budgets, and achieve institutional missions (Summerskill, 1962). Studies of pre-entry attributes in the 1960s and 1970s included the influence of age, gender, and family background.

Spady (1970) advocated for the abandonment of all such studies as too simplistic (p. 77), while Tinto suggested that such studies tended to "blame the victim" (WGU labs, 2021, 9:29). Tinto (1993) believed that a focus on pre-entry attributes left a critical component out of the equation and framed students who failed to persist as inherently flawed. He also criticized such studies as difficult, if not impossible, to translate into institutional policies that could support persistence, particularly for open admission institutions.

Table 1 summarizes the findings related to pre-entry attributes from nine publications written between 1960 and 2003. Each column in Table 1 identifies a pre-entry attribute; the relative strength of the findings is designated as weak (W), moderate (M), or strong (S). For example, if the researcher reported that the attribute was "insignificantly related to dropping out" (Marsh, 1966, p. 477) or otherwise reported weak findings, then the study received a designation of "W." On the other hand, if the attribute is described by conflicting studies or statistically relevant findings only under specific conditions, the attribute was designated to have moderate "M" support. Finally, if a researcher reported the findings of strength with such phrases as clearly shown (Astin, 1975), consistently significant (Reason, 2003), or the "strongest single-variable predictor" (Pantages & Creedon, 1978, p. 62), then the study received a designation of "S."

Table 1

Summary of Research on Pre-Entry Attributes 1960-2003

Primary Source	Age	Race	Gender	Family background / SES	Hometown location/ size	IQ/ ACT/ SAT	H.S. grades / rank	Delayed entry
Summerskill (1962)	W		W	W	W	S	S	
Sexton (1965)	M			W		S	S	
Marsh (1966)				W		S	M	
Tinto (1975)			W	M			S	
Astin (1975)	M	S		M	M		S	M
Pantages & Creedon (1978)	W	M	W	M	W	S	S	
Lenning et al. (1980)	W	M	W	W	W	W	M	

Primary Source	Age	Race	Gender	Family background / SES	Hometown location/ size	IQ/ ACT/ SAT	H.S. grades / rank	Delayed entry
Peltier et al. (1999)	W	M	W					
Reason (2003)		S	W			S	S	

Note: SES = socioeconomic status; IQ = intelligence quotient; ACT = American College Testing; SAT = Scholastic Assessment Test; H.S. = high school;

Several decades of research and advances in statistical analysis resulted in growing support for the proposition that any direct linkages between pre-entry attributes and persistence were weak and often conflicting (Pascarella & Terenzini, 1983; Terenzini et al., 1981). High school performance, known to be one of the strongest predictors of persistence, typically did not achieve a correlation above .50 (Lenning et al., 1980, Pantages & Creedon, 1978) and might account for only 12% of the variance in retention (Reason, 2003). Increasingly, researchers found that the student's experiences at the institution had a greater effect on the decision to dropout than any of the background traits the student brought to the institution (Stoecker et al., 1988; Terenzini & Pascarella, 1978). Nevertheless, pre-entry attributes were often found to have a direct effect on other constructs in Tinto's (1993) model and thus yielded an indirect effect on persistence (Hazard Munro, 1981; Mallette & Cabrera, 1991).

Consequently, persistence scholarship has continued to incorporate the pre-entry attributes listed in Table 1 along with less common attributes such as high school involvement (i.e., varsity letter, leadership, and athletics) (Stoecker et al., 1988), religion (Astin, 1975), or highest degree planned (Terenzini & Wright, 1987a). More recent research acknowledged the influence of these pre-entry attributes as well as their limitations. As a result, modern persistence

research routinely designates pre-entry attributes as control variables in order to limit their influence and enhance internal validity (Schreiner & Nelson, 2013; Xu & Webber, 2018).

Goal Commitments

Tinto (1975) deviated from Spady (1970) with his addition of goal commitment as a mediating variable. Whereas Spady (1970) theorized that pre-entry attributes directly influenced student interactions with the social systems, Tinto (1975) believed the influence was indirect, arguing instead that pre-entry attributes influenced students' experiences within the social and academic systems through the mediating variable of goal commitment and institutional commitment. The construct of commitment concerns a student's psychological disposition toward higher education and includes the student's level of commitment to achieving a particular educational or career goal as well a student's commitment to a specific institution. Tinto theorized that goal and institutional commitment varied over time. As a result, goal commitment appears twice in Tinto and Cullen's (1973; Tinto, 1997) model, once at admission and a second time after being influenced by the student's institutional experiences.

Tinto and Cullen (1973; Tinto, 1997) asserted the existence of two types of commitments. The first, goal commitment, referred to a student's level of commitment to completing a college degree. Tinto (1993) theorized that a student who aspires to be a lawyer or any career requiring post- baccalaureate education, is more likely to finish a bachelor's degree than a student of similar aptitude who has no clear career goal. The second type of commitment is institutional commitment. Institutional commitment would be a student's commitment to a specific institution. This could occur with legacy students, those with one or more family members who graduated from the same institution, thereby increasing the student's motivation to obtain a degree from the same institution. Tinto (1993) believed that students with greater goal

and institutional commitment have an increased likelihood of persistence. In his longitudinal model, Tinto (1997) hypothesized that students enter institutional communities with pre-entry attributes and particular levels of commitment to their respective goals and institutions. What happens next – their interactions with the institution's academic and social systems – has the ability to alter those commitments positively or negatively, thereby influencing their decision to persist or withdraw.

Pascarella and Terenzini (1983) conducted a path analysis of Tinto's model using survey data from 773 freshman at a large, residential institution in New York. After operationalizing the five major constructs from Tinto's (1975) model (see Figure 2), the researchers performed a discriminate analysis and found that, like pre-entry attributes, initial commitment levels had little influence on persistence; however, later commitment measures, which have been influenced by the students experience at the institution, significantly increased the explained variance. Similarly, Hazard Munro (1981) determined that goal commitment had the strongest influence on persistence in her study of over 6,000 high school graduates who started college full-time in the fall of 1972. Another multiinstitutional study conducted by Pascarella and Chapman (1983) found that both goal and institutional commitment had a significant influence on persistence; however, disaggregating the data by institution type showed that institutional commitment had a greater influence at 4-year residential and commuter institutions, and goal commitment had more influence at 2-year institutions.

External Commitments

External commitments as a factor in the decision to stay or leave an institution did not become part of Tinto's model until 1993. In Figure 3, external commitments are depicted as somewhat outside the model itself, influencing a student's level of goal and institutional

commitment continuously through the pre- and post-admission stages. The appearance of external commitments in the 1993 version of Tinto's model coincided with an era of decreasing state funding (Bastedo et al., 2016), growth in the nontraditional student population (Lucas, 2006), and an increase in the number of traditional students working part or full-time in response to the rising costs of higher education during the 1980s and 90s. During this time, scholars were actively exploring the impact of external factors, particularly as they sought to understand whether Tinto's model could help explain departure patterns for individuals other than young, Caucasian, residential students.

The addition of external commitments to Tinto's (1993) model may also have been a response to scholarly criticism. Weidman and White (1985) modified Tinto's model to include external challenges related to transportation, health, and finances. They found that these challenges were significantly higher among those women who dropped out. Aitken's (1982) study of 892 freshmen at the University of Massachusetts found family and personal problems to be statistically significant within his retention equation. In fact, Tinto (1982b) acknowledged that his 1975 model failed to "address the impact of financial press or other forces external to the institution's immediate environment" (p. 688). After adding external commitments to the 1993 version of the model, Tinto (1993) reiterated his belief that family, finances, health, and other factors influenced the dropout decision only indirectly by supporting or hindering the student's ability to become academically and socially integrated within the institution.

Institutional Experiences

What Spady (1970, 1971) and subsequently Tinto (1975) brought to the study of persistence was the role of the institution in student departure. This was accomplished through the use of Durkheim's theory of suicide. Durkheim was attempting to explain why some

countries had higher rates of suicide than others (Tinto, 1993). Durkheim hypothesized that higher rates of suicide occurred when individuals were unable to integrate into the social system. The individual's experiences within the social system either reinforced or weakened his or her integration within the system. While Durkheim considered the social system to be a singular concept, Tinto (1975) modified this aspect of Durkheim's theory to account for a duality within higher education: the presence of both social and academic domains that are at once distinct while at the same time overlapping.

Tinto (1975) initially characterized students' experiences in the social and academic domains as each having two facets: normative and structural. For example, in the social domain, Tinto (1975) relied on Spady's (1970) description of normative integration as "congruence," (p. 77) or having attitudes and dispositions that are compatible with others in the social system. Conversely, structural integration within the social domain is reflected in friendships, peer group associations, and positive interactions with faculty and staff. Tinto (1975) likewise described the academic domain as having normative and structural components. Normative integration within the academic domain is an alignment between the individual's intellectual expectations and the intellectual environment of the institution, whereas grade performance is representative of structural integration within the academic domain.

In Tinto and Cullen's 1973 model, the two university systems (social and academic) were entirely separate with each containing normative and structural components. This depiction aligned with Tinto's (1975) observation that a student's decision to drop out could be influenced by one or the other system; the influence did not need to be reciprocal. Deficiencies in the normative or structural components of the social system (i.e., insufficient friendship support or conflicting values) increased the risk of departure even when a student excelled within the

academic system. Likewise, deficiencies in the normative or structural components of the academic system (i.e., poor grades or unmet intellectual expectations) increased the risk of voluntary departure among even those students with strong social connections. Additionally, Tinto (1975, 1993) observed that the two systems could be compensatory. Strong normative and structural experiences in one system could sometimes offset weaker experiences in the other system. This is seen when a student with strong social connections remains at an institution despite weak normative and structural performance in the academic system, so long as performance remains above minimum institutional thresholds.

By 1997, Tinto's model depicted a much closer relationship between the social and academic systems of an institution and elevated the role of the classroom as a bridge between the two systems. The normative and structural components present in earlier versions of the model were noticeably absent, and in their place a new component containing the words, "classes, labs, studios" overlaid the social and academic systems (Tinto, 1997, p. 615).

Academic & Social Integration

Durkheim coined the term social integration to represent the process that occurs when individuals become members of a community. Durkheim theorized that remaining outside the community or failing to obtain membership was antecedent to suicide. Spady (1970) and Tinto (1975) believed the college environment was analogous to the wider community studied by Durkheim. Therefore, it followed that a student's successful integration into the university community would be a prerequisite to continued membership, and failure to successfully integrate would increase the likelihood that a student would choose to leave the institution. The two scholars diverged on the construct of integration. While Spady (1971) represented integration with a single construct titled "social integration" as Durkheim had done, Tinto (1975)

created two separate constructs to align with the dual systems present in the university environment.

Significant research has been conducted to validate the existence of the social and academic integration constructs. Initial results were largely favorable, but studies involving minorities and 2-year institutions were mixed. One of the first studies was by Terenzini and Pascarella (1977), who sent surveys to a random sample of freshmen at Syracuse University toward the end of their freshman year. The researchers divided respondents into two groups (stayers and leavers) and found that social and academic integration were equally important to students' decisions to remain or drop out. Two years later, Pascarella and Terenzini (1979) again used survey data from several hundred residential freshmen and found that social and academic integration contributed to a significant increase in the ability to explain student drop out. Finally, Terenzini and Pascarella (1980) conducted six separate studies the following year. In each of the six analyses, academic and social integration were shown to make a statistically significant contribution to the variance between students who persisted and those that left.

Early research on academic and social integration dealt primarily with traditional, residential students at 4-year, public universities (Getzlaf et al., 1984; Terenzini & Pascarella, 1977; Terenzini & Pascarella, 1980). That changed when Donovan (1984) conducted a path analysis on a cohort of 403 low-income black students at 69 colleges and universities. Donovan's findings supported earlier results that social and academic integration were significantly related to persistence. When Nora (1987) and Ashar and Skenes (1993) studied academic and social integration among Hispanic and nontraditional students, however, they found that only social integration had a significant effect on retention. It should be noted that Ashar and Skenes acknowledged that the data used in their analysis were incomplete.

Student Effort & Learning

In the two decades that followed publication of Tinto's (1975) model of student attrition, most of the persistence research focused on testing Tinto's model and defining its variables and constructs, including integration (Ashar & Skenes, 1993; Garrison, 1985; Hazard Munro, 1981; Jack Lam, 1984; Pascarella et al., 1983; Terenzini & Pascarella, 1980). Pre-entry attributes that formerly dominated the persistence literature were found to have a significant influence on academic and social integration but little direct influence on the decision to leave or persist (Hazard Munro, 1981; Pascarella & Terenzini, 1979; Terenzini & Pascarella, 1980). In 1982, Tinto himself acknowledged the limitations of his model, prompting a spate of research seeking to modify or expand Tinto's (1975) model. This included studies of non-residential institutions (Bers & Smith, 1991; Pascarella et al., 1983), studies of influences other than those identified in the model (Cabrera et al., 1992), and studies involving students of varying age (Ashar & Skenes, 1993; Cleveland-Innes, 1994; Garrison, 1985; Grosset, 1991), race, and ethnicity (Pascarella, 1985).

By 1993, Tinto was working on the second edition of *Leaving College: Rethinking the Causes and Cures of Student Attrition*, which was originally published in 1987. The second edition reflected what Tinto (1993) saw as an emerging link between student learning and persistence. He concluded that, "the same forces of contact and involvement [integration] that influence persistence also appear to shape student learning . . . and students who report having made learning gains while in college are more likely to persist, other things being equal" (Tinto, 1993, p. 69, 71). Nevertheless, only external influences were added to the 1993 version of the model. The importance of the relationship between involvement, effort, learning, and persistence did not appear in Tinto's model until his 1997 article, "Classrooms as Communities" (See Fig.

3). In the article, Tinto (1997) purported to "bridge the gap" between empirical studies that looked at the impact of teaching, pedagogy, and classroom environment on student learning and those related to persistence (p. 601). Just as external commitments were at the forefront of persistence research through the 1980s and 90s, the prominence of teaching and learning in Tinto's 1997 model was representative of a similar focus in educational literature generally and persistence literature specifically toward the turn of the 21st century.

Part of the impetus for Tinto's (1997) new focus on learning and persistence was a mixed method, longitudinal study of learning communities and collaborative learning at the Seattle Central Community College. Tinto found that students involved in these learning activities reported significantly more positive perceptions of the classroom, peers, and college environment and were significantly more likely to persist to the next quarter as compared to students in the regular curriculum. Tinto hypothesized that educational environments which allowed students to integrate socially and academically – at the same time – motivated students to devote a greater quality of effort resulting in more learning, which positively influenced subsequent departure decisions.

Involvement

In the 1997 revisions to his departure model, Tinto combined his emphasis on learning with another thread of scholarship related to student involvement and effort. Astin's (1999/1984) theory of student development proposed that student learning and development were directly proportional to student involvement. Astin defined involvement as "the amount of physical and psychological energy that the student devotes to the academic experience (1999/1984, p. 518). Astin viewed involvement broadly as encompassing all activities that students may engage in during the college experience.

According to Astin (1999/1984), his theory arose from a large longitudinal study he had conducted ten years earlier. The purpose of the study, which used a representative sample of 217 U.S. colleges and universities and included over 100,000 students, was to identify factors that influenced student persistence (Astin, 1972). Astin (1999/1984) argued that every factor the earlier study had identified, which positively or negatively influenced persistence (e.g., sports, ROTC, clubs, student-faculty interaction, student research) could be explained through the lens of involvement. Astin's thoughts regarding student involvement may have also been influenced by the work of C. Robert Pace, who was a colleague of Astin's at the Higher Education Research Institute at the University of California Los Angeles. Pace's work (1982, 1984) is discussed further in the next section.

Using Astin's (1999/1984) theory as a framework, many scholars found support for the positive influence of student involvement. Terenzini and Wright (1987a) conducted a longitudinal study of 1,105 freshmen and found that greater levels of involvement led to perceived gains in academic growth during the first two years. When Terenzini and Wright surveyed the freshmen again as seniors, the researchers found that levels of involvement were cumulatively related to levels of academic development across the entire period (Terenzini & Wright, 1987b). Kuh et al. (2008) found in their study that an increase of one standard deviation in involvement during the first year of college resulted in a .04 increase in GPA, while Berger and Milem (1999) found that early involvement had a significant effect. Nevertheless, all involvement was not created equal. Involvement between students and faculty was found to be one of the most statistically significant influences on academic achievement and persistence (Pascarella & Terenzini, 1979; Terenzini & Pascarella, 1977; Tinto, 1997), particularly for minority students (Xu & Webber, 2018).

Effort

In a closely related line of research, Pace (1982) conducted research on student effort that resulted in the development of the College Student Experiences Questionnaire (Pace, 1979). Pace was responding to what he believed was an overemphasis on the responsibility of the institution in the educational process. Pace (1982) defined effort as the quality of investment a student makes in "events and conditions and facilities which the college makes possible, and which are intended to facilitate student learning and development" (p. 2). When his colleague Astin (1999/1984) published a theory on student involvement two years later, Astin asserted that Pace's (1982) concept of effort was "much narrower" (p. 518) than his own construct of student involvement.

Pace's work on student effort and much of the research his work inspired focused on the relationship between student effort and academic gains. Initial findings using the College Student Experiences Questionnaire showed that students' quality of effort was one of the most influential variables linked to student learning (Pace, 1982). Subsequent studies validated these findings for 2-year institutions (Swigart & Murrell, 2001), multi-institutional studies (Davis & Murrell, 1993), and single institution studies (Erekson, 1992). The key finding of these student effort studies was the validation that "what counts most is not who they [students] are or where they are but what they do" (Pace, 1982, p. 20). This sentiment closely mirrors Tinto's own proposition that all other things being equal, students who become more academically and socially integrated are more likely to persist (Tinto, 1993).

National Survey of Student Engagement

Pace (1979) contributed to the work of Alexander Astin, Gary Barnes, Arthur Chickering, George Kuh and others at the National Center for Higher Education Management Systems and

the Center for Postsecondary Research and School of Education at Indiana University to create the National Survey of Student Engagement (NSSE) (National Survey of Student Engagement [NSSE], n.d.). Developed in 1999 with a grant from the Pew Charitable Trusts, NSSE began collecting data in 2000 from 275 colleges and universities (Indiana University, Center for Postsecondary Research [IU-CPR], n.d.a.). NSSE was a manifestation of the growing demand for metrics on the success or failure of higher education to meet policy and public demands for student outcomes related to critical thinking, communication, and problem solving (IU-CPR, n.d.b).

The vision for NSSE was to provide a new measure for the quality of a college or university. The designers coined the term engagement, which brought together three main areas of research related to student success and persistence: (a) involvement, (b) educational experiences, and (c) student effort (Bastedo et al., 2016; NSSE, n.d.; Wolf-Wendel et al., 2009). According to NSSE, these three measures are a more useful and accurate assessment of institutional quality than national rankings or even accreditations (NSSE, n.d.). Thus, what makes engagement distinct from involvement or quality of effort, is an attempt to link those concepts with best practices in undergraduate education (Wolf-Wendel et al., 2009).

The three NSSE building blocks are also found in Tinto's model (1997). Involvement is seen in the social and academic systems of an institution. This is where students invest their "physical and psychological energy" (Astin, 1999/1984, p. 518). Although the term involvement doesn't appear in the model, Tinto began using the term involvement in his writings to describe student experiences in the social and academic systems (Tinto, 2000). Within the academic system, quality educational experiences enhance a student's academic and social integration, which in turn positively influences the quality of effort made by the student.

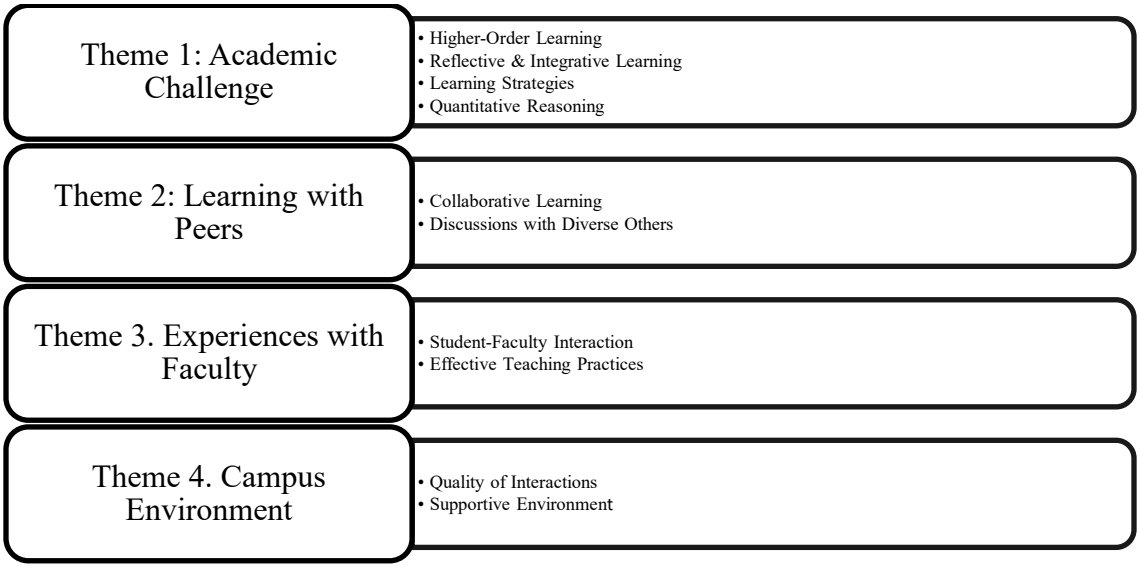
George Kuh, NSSE's founding director, argued that student involvement was crucial to achieving desired outcomes. Consequently, the original NSSE survey highlighted five areas believed to support positive gains in students' personal and intellectual development:

- level of academic challenge
- active and collaborative learning
- interactions with faculty members
- enriching educational experiences, and
- supportive campus environment. (Kuh, 2001, p. 13)

After ten years of administration, NSSE underwent major reconstruction. While maintaining its original purpose of collecting actionable data on student engagement, the updated NSSE reflected advances in teaching and learning in the first decade of the 21st century and clarified survey language by modifying existing measures and adding 25% new material (IU-CPR, n.d.b). The new NSSE 2.0, represented by Figure 5, was also reorganized into "ten 'Engagement Indicators,' nested within four broad themes that echo the benchmarks" (IU-CPR, n.d.b, para. 28).

Figure 5

NSSE Themes and Engagement Indicators



Research empirically linking student effort and involvement to academic gains and persistence, respectively, raised the question of how institutions could motivate students to increase involvement and effort. Attempts to answer this question generally fell into two different categories; one group explored the use of student affairs professionals to engage students in predominantly extracurricular activities. The second group looked at the academic experience, and the classroom in particular, as an avenue for enhancing student involvement and engagement through innovative pedagogical techniques. The next section synthesizes the research on some of those pedagogical techniques that have been shown to increase integration and learning.

Related Literature

Measures of student effort have been in decline for decades. In a study of the time students spend studying, Babcock and Marks (2011) found that between 1961 and 2003, the time that students spent studying decreased by over 30%. Similar findings were reported by Brint and

Cantwell (2010) based on a study of 6000 students, who reported to have spent less than 30 hours per week attending class and studying. Based on these findings, students are spending two thirds of their waking hours on non-academic activities (Ostrow et al., 2021). This is concerning given that time and effort spent on educational activities is the best predictor of student learning (Pace, 1984; Pascarella & Terenzini, 2005;).

Effective Educational Practices

In the mid-1980s, amid public outcry for the reform of undergraduate education, a group of scholars gathered at the Wingspread Conference Center in Racine, Wisconsin, to pool their collective knowledge on the most effective educational practices in undergraduate instruction (Chickering & Gamson, 1987; Kuh, 2001). The result of this meeting was the 1987 publication by Chickering and Gamson, "Seven Principles for Good Practice in Undergraduate Education." The seven principles which followed represented almost half a century of educational research on excellence in undergraduate teaching. The principles are broad recommendations and applicable to any field of study and any type of institution. The remainder of this section is organized by the seven principles and the unique educational interventions that have come to be associated with them.

Encourages Contacts Between Students and Faculty

Faculty-student interaction both inside and outside the classroom may be one of the most deeply studied topics in educational literature (Pascarella & Terenzini, 2005). Such a broad topic encompasses informal interactions of an academic or non-academic nature as well as formal interactions that occur in the context of the classroom. Research related to faculty-student interaction often focuses on specific teacher behaviors such as immediacy, organization, expressiveness, or clarity and may examine a plethora of possible outcomes including academic

achievement, motivation, or attitudes about a particular subject. Despite the abundance and variety of research, few studies consider persistence as a possible outcome. Two notable exceptions were Nora et al. (1996), who found that student perceptions of informal interactions with faculty significantly increased the likelihood of persistence for females, and Braxton, Bray, and Berger (2000), who found that specific teacher behaviors in the classroom (organization and clarity) had positive effects on both social integration, institutional commitment, and intent to reenroll.

Student-faculty interaction has been shown to be significant in other valuable outcomes. In a study of student-faculty interactions between 1990 and 1997, Kuh and Hu (2001) found that student-faculty interactions positively influenced student effort and all areas of self-reported gain. Wolfe (2018) concluded that student-faculty interaction at 26 two-year institutions was a significant predictor of student intent to transfer into a geoscience major, and Cox and Orehovec (2007) found benefits among all types of student-faculty interactions (incidental, functional, personal, and mentoring). Despite the empirical evidence of the many benefits of student-faculty interaction and the calls for reform at the end of the 20th century, Koljatic and Kuh (2001) found little change in the frequency of student-faculty interaction between 1983 and 1997.

Develops Reciprocity and Cooperation Among Students

Although Chickering and Gamson (1987) did not use the term collaborative learning in their recommendations of good practice, they did recommend classrooms that "develop reciprocity and cooperation among students" (p. 3). The idea of students learning together is the basis for collaborative learning (Barkley et al., 2005). While there continues to be a debate over possible distinctions between collaborative and cooperative learning (Barkley et al., 2005), that is beyond the scope of this study; hence, the terms will be used interchangeably. Collaborative

learning is characterized by learning activities completed in groups, where group members work interdependently and cooperatively, while maintaining individual accountability (Pascarella & Terenzini, 2005).

Postsecondary studies of collaborative learning have shown that it has a strong tendency to promote higher achievement and greater productivity (Barkley et al., 2005; Johnson et al., 1981; Pascarella & Terenzini, 2005). When compared to individual learning or competitive learning dynamics, cooperative learning and small-group learning demonstrated more learning gains (Pascarella & Terenzini, 2005). Unfortunately, only two studies were located that considered the impact of collaborative learning on persistence. Loes et al. (2017) studied incoming freshman at 19 U.S. colleges and universities (2,987 participants). Using logistic regression and controlling for pre-entry attributes, the researchers found that students with higher scores on collaborative learning were about 3% more likely to reenroll than those who experienced less collaborative learning. In the second study, Laux et al. (2016) found a more modest, indirect, but nevertheless positive effect between collaborative learning and retention mediated by sense of community.

Uses Active Learning Techniques

In describing active learning, Bonwell and Eison (1991) said, “students do more than just listen: They must read, write, discuss, or be engaged in solving problems” (p. 5). When Chickering and Gamson (1987) included active learning in their recommendations for good undergraduate teaching, there was already fifty years of evidence attesting to its benefits. Pascarella and Terenzini (2005) summarized another decade of empirical support for the positive impact of active learning techniques in their second edition of *How College Affects Students*. Braxton, Milem, and Shaw Sullivan (2000) found that class discussion and higher order thinking,

both indices of active learning, had a direct positive influence on social integration. Class discussion also had a positive influence on persistence, but knowledge-level exams, which suggest passive learning, had a negative influence on persistence.

In a replication of Braxton, Milem, and Shaw Sullivan's work (2000), Braxton et al. (2008) found that active learning did not have a statistically significant influence on social integration; however, they did find a significant indirect relationship between active learning and social integration after controlling for pre-entry attributes. Active learning has also been shown to increase persistence within a particular major (Miller et al., 2021; Wilton et al., 2019), increase grades (Bull Schaefer & Copeland, 2022), and increase students' attitudes toward course material (Tutal & Yazar, 2022).

Gives Prompt Feedback

Among the seven principles articulated by Chickering and Gamson (1987), giving prompt feedback may be the simplest to understand if not the simplest to implement. According to Hattie and Yates (2016), the term feedback was initially used in the engineering context to refer to a machine's ability to automatically alter output based on the input it received. Accordingly, within the educational context, feedback is one of the most touted ways to alter performance, however, the effect is far from automatic (Hattie & Yates, 2016).

It seems self-evident that the purpose of feedback is to help improve the performance of the recipient (Nilson, 2016), but not all feedback is equally effective, (Hattie & Yates, 2016) neither does all feedback have positive impacts on student performance. In fact, a significant number of studies have shown that feedback was detrimental to performance (Kluger & DeNisi, 1996). In general, effective feedback needs to be (a) focused on the task and not the student (Brinko, 1993; Hattie & Yates, 2016), (b) given by a trusted and respected source (Winstone et

al., 2017), (c) high-quality and specific (Brinko, 1993; Winstone et al., 2017), (d) framed as a process that encourages investing greater effort and the assurance of capacity to improve (Hattie & Yates, 2016; Nilson, 2016; Winstone et al., 2017), and (e) received by the recipient in sufficient time to read, internalize, and apply the feedback to subsequent efforts (Winstone et al., 2017).

Emphasizes Time on Task

Time on task refers to the amount of time that students devote to learning activities. At the macro-level, time on task refers to Carnegie units in K-12 education and credit hours in postsecondary education. At the turn of the 20th century, national K-12 educational systems lacked any standardized curriculum or temporal requirements, which made the evaluation of college applicants significantly more difficult (Shedd, 2003). The Committee of Ten on Secondary School Studies and the Committee on College Requirements recommended a standardized curriculum and "unit" of contact-hour instruction. A few years later, when the Carnegie Foundation instituted a retirement program for university professors, they made institutional acceptance of the unit system a pre-requisite for participation (Shedd, 2003).

At the classroom level, research sometimes conflates time on task with engagement, involvement, or quality of effort. Kuh et al. (2008) found that time on task (measured by NSSE as engagement) had a statistically significant impact on both academic achievement and persistence for all students, but had an additional compensatory effect for lower ability students. Nevertheless, Thibodeaux et al. (2017) found that first-year college students planned to spend very little time studying outside of class and responded to lower than expected grades in their first semester by lowering their expectations for the second semester rather than increasing study time. Additionally, Guillaume and Khachikian (2011) found that engineering students earning a

'C' at the mid-point of the semester were more likely to decrease their time on task even when increased time on task would likely result in a better grade (Guillaume & Khachikian, 2011).

Communicates High Expectations

The sixth principle of good undergraduate teaching is communicating high expectations for student performance. Unlike some of the other principles that recommend better processes or behaviors, the underpinnings of this principle are founded on the subjective beliefs of the instructor. Communicating high expectations alone is insufficient unless the faculty member truly believes that the students are capable of reaching those expectations (Scott & Tobe, 1995).

Perhaps the most famous study of the impact of teacher expectations on student achievement is the 1968 study by Rosenthal and Jacobson. In the study, Rosenthal and Jacobson conducted testing on first through fifth graders at an elementary school in San Francisco at the end of the 1963-64 school year. The school was in a part of town that drew both lower socioeconomic and middle-class children, and it had three classes for each grade: above-average, average, and below-average ability. At the beginning of the 1964-65 school year, Rosenthal and Jacobson made a random selection of approximately five students from each class. Then, at a regular staff meeting, the names of the randomly selected students were casually mentioned to the teachers along with the comment that the children "could be expected to show unusual intellectual gains in the year ahead" (p. 22).

Rosenthal and Jacobson (1968) assessed the students mid-way through the 1964-1965 school year and at the end of the school year. All the children (first through sixth grade) participated in the testing. The researchers found that those children from whom the teachers were told to expect intellectual gains did so, and at a significantly greater rate than their classmates. The result became known as the Pygmalion effect (Szumski & Karwowski, 2019) or

the self-fulfilling prophesy effect (de Boer et al., 2010). The 1968 study received criticism for what scholars perceived to be methodological weaknesses, but it prompted decades of research related to teacher expectations (de Boer et al., 2010).

While results have been mixed, research has shown that "some teachers do form and communicate differential expectations to their students and that some students internalise [sic] these expectations in ways that manifest in their actual performance" (Good et al., 2018, p. 100). Teacher expectation research was initially focused on primary and secondary education, but in recent years there have been several studies in higher education, including the impact of self-fulfilling prophesy at HBCUs (Joonas, 2016), in college composition classes (McLeod, 1995), and in courses where English is taught to non-native speakers (Chang, 2011; Li & Rubie-Davies, 2018; Tsiplakides & Keramida, 2010). It appears that in higher education, there may be more factors to consider when studying the effects of teacher expectation (Timmermans et al., 2018).

Respects Diverse Talents and Ways of Learning

Chickering and Gamson (1987) provided little in the way of explanation for the seventh and final principle of good undergraduate teaching. The broad proposition could apply to several strands of educational scholarship. First, Benjamin Bloom (1956) developed a taxonomy of cognitive development which delineates various levels of knowledge in order of complexity (remember, understand, apply, analyze, evaluate, and create). The purpose was to help educators recognize that different levels of knowledge are appropriate at different times and encourage the intentional alignment of learning objectives with the level at which students are expected to make use of the knowledge (Slavin, 2016). Faculty who attend to Bloom's (1956) taxonomy and vary their learning objectives according to course level, expectations, and desired student development could be described as applying different ways of learning.

Another strand of research that could fall within this principle is that of learning styles. There are several models within the literature, but only two will be addressed here as representative of the field. First, the work of David and Alice Kolb (2013) is based on David's experiential learning theory, published in 1984, just a few years before Chickering and Gamson's (1987) seven principles. Now, in its third revision, the learning styles inventory is based on the experiential learning theory, which posits that learning takes place only as individuals process experiences they have had through four separate learning modes (Kolb & Kolb, 2013). Kolb and Kolb assert that learners have certain preferences for these learning modes and thus progress through the learning stages in slightly different ways. Understanding the experiential learning cycle and individual preferences as they relate to the various modes of learning allows educators to construct learning activities that would engage all learning modes and assist students in processing their experiences.

A second model of learning styles, the VARK model, was developed by Fleming and Mills (1992). A much more simplistic model, the VARK model is based on the premise that students have preferred learning styles which align with the sensory perception of information. Each letter addresses a different facet of sensory perception (V – visual, graphic; A – auditory; R – printed words; K – kinesthetic). By allowing students to experience new content in a variety of modalities, educators can adapt to different ways of learning. Liftig (2021) found benefits in engagement and motivation when applying the VARK model to enhance instruction in history.

Unfortunately, empirical support for these and other learning style models has been inconsistent (Slavin, 2016). In fact, Pashler et al. (2008) found "no evidence" (p. 116) that matching instructional approach to learning style produced any learning gains. The study of learning styles is perhaps the best example of the disconnect between research and practice.

While pre-licensure teacher preparation programs continue to teach the benefits of learning style theory, many researchers balk at the proposition (Furey, 2020; Kirschner, 2017; Nancekivell et al., 2020; Olson, 2006). Among the seven principles put forth by Chickering and Gamson (1987), the seventh and final principle may be the least understood and most frequently debated.

High-Impact Practices

The 1980s and 1990s saw significant focus on effective educational practices in higher education. Scholars tested and reported on various interventions intended to capitalize on the seven principles outlined by Chickering and Gamson (1987). Ten interventions found to deliver consistently positive results for a broad range of student demographics were listed in a 1997 publication by the American Association of Colleges & Universities, "College Learning for the New Global Century." The interventions were described as "high-impact" and were promoted as innovative educational practices that could help improve higher education across the board, but for the reality that very few students had the opportunity to experience them (National Leadership Council, Liberal Education & American's Promise [NLC-LEAP], 2007, p. 5). The list of 10 included, first year seminars, learning communities, collaborative assignments, internships, and capstone projects. Charles Kuh, NSSE's founding director, served as a member of the National Leadership Council for Liberal Education and America's Promise which produced the report. The following year, in a subsequent publication, Kuh (2008) cross-referenced the 10 effective educational practices, which he dubbed "high impact activities," (p. 14) with NSSE data to empirically show the powerful benefits to achievement and persistence such experiences could provide across gender, race, and ethnicity.

As the use of high-impact educational practices (HIPs) grew, Kuh and O'Donnell (2013) followed up the 2008 publication with a call to increase the number of students able to benefit

from HIPs by promoting better quality implementation. Soon scholars began confirming the ability of HIPs to positively influence critical thinking (Kilgo et al., 2014), degree attainment (Andrews, 2018; McDaniel & Van Jura, 2020), and civic engagement post-graduation (Myers et al., 2019). As more institutions launched their own unique programs under the HIP moniker, however, lack of quality control measures and defined standards resulted in significant variation across institutions with some failing to achieve desired outcomes. In response, Kuh and O'Donnell (2013) provided a list of eight qualities that characterized a HIP. In Table 2, the eight HIP qualities are placed side-by-side with Chickering and Gamson's (1987) seven principles to highlight their similarities.

Table 2

Comparison of Seven Principles and High Impact Elements

Seven Principles for Good Practice in Undergraduate Education (Chickering & Gamson, 1987)	High Impact Practices: Eight Key Elements (Kuh & O'Donnell, 2013).
Encourages contacts between students and faculty	Interactions with faculty and peers about substantive matters
Develops reciprocity and cooperation among students	Periodic, structured opportunities to reflect and integrate learning
Uses active learning techniques	Opportunities to discover relevance of learning through real-world application
Gives prompt feedback	Frequent, timely, and constructive feedback
Emphasizes time on task	Significant investment of time and effort by students over an extended period of time
Communicates high expectations	Performance expectations set at appropriately high levels

Respects diverse talents and ways of learning	Experiences with diversity, wherein students are exposed to and must contend with people and circumstances that differ from those with which students are familiar
	Public demonstration of competence

Despite the significant amount of empirical support for HIPs, the results have been disputed (Johnson & Stage, 2018). One study in particular, conducted by Johnson and Stage (2018) examined the relationship between high-impact practices and degree completion at 101 U.S. institutions. This multi-institutional study collected data through (a) self-reported survey responses, (b) the U.S. Department of Education's Integrated Postsecondary Education Data System, and (c) *Barron's Profile of American Colleges*. Johnson and Stage analyzed the impact of individual HIPs as well as using a composite score that represented a total value of HIPs at the institution. The score assigned to each HIP was based upon the availability of the HIP, and ranged from "required for all students" to "optional for students or not offered" (p. 762). After controlling for institutional selectivity, Carnegie classification, and student body demographics, two of the individual HIPs (internships, freshman seminars) showed a negative influence on graduation rates while the remaining eight HIPs had no significant relationship with graduation rates.

The results of the Johnson and Stage (2018) study surprised many and elicited a swift response from Kuh and Kinzie (2018), who reaffirmed the positive results of previous HIP studies and questioned Johnson and Stage's use of "aggregate, institutional-level data" (para. 15), which they suggested obscured questions of HIP quality and implementation. In the end,

both Johnson and Stage (2018) and Kuh and Kinzie (2018) called for more studies involving HIPs and their influence on student and institutional outcomes.

Summary

Student retention and persistence has been a major area of educational research for nearly 100 years. The first half of that period was spent focused on the individual qualities of college students, trying to identify which, among a plethora of pre-entry attributes, had the most influence on a student's decision to drop-out. Near the midpoint, scholars began to recognize the need for a theory to help explain current research and provide a framework for future studies. Several theories were proposed, including Spady (1970, 1971), Tinto (1975, 1993, 1997), Bean (1980), and Astin (1999/1984), but it was Tinto's longitudinal model of student departure that captured the most attention and rose to what Braxton and colleagues called "near paradigmatic status" (Braxton, Bray, & Berger, 2000, p. 215). The model set out a series of temporal phases beginning before the student has been admitted to college and concluding with the student's decision to persist or drop-out. One of the most critical phases in this process is what Tinto referred to as "integration." Integration occurs – or fails to occur – as the student interacts with the social and academic systems of the institution through curricular and co-curricular involvement.

A growing number of U.S. college students do not live on campus. For these students, time spent in classes, labs, studying, and interacting with faculty, form the basis for a significant portion of a student's academic experience. Experiences that Tinto (1975, 1993, 1997) would argue exert a powerful influence on a student's decision to reenroll or drop out. During the mid-1980s, rising tuition rates and paltry graduation rates spurred parents, politicians, and members of the public to demand evidence that students were receiving a high-quality academic

experience. Scholars responded by compiling research of effective educational practices supported by decades of empirical evidence, and national surveys were instituted, designed to measure and report the extent to which students participated in these practices.

Experimentation and implementation built a record of achievement for a series of effective educational practices, which came to be known as HIPs. These HIPs began as a list of 10 interventions but expanded to encompass many more, all sharing eight common elements that mirror the principles Chickering and Gamson (1987) had promoted a decade earlier. But not all HIPs are created equal (Kuh & Kinzie, 2018; Kuh & O'Donnell, 2013). Johnson and Stage (2018) questioned whether HIPs were equally effective and whether they supported student persistence. Additional research regarding HIPs and student persistence is necessary to help institutions make wise use of scarce resources and help establish the dimensions of HIP quality needed to support student persistence. The current study contributed to the literature in the field of student dropout by testing Tinto and Cullen's (1973) theory and exploring the predictive strength of the classroom environment – characterized by HIP or non-HIP pedagogical practices – on institutional integration and persistence.

CHAPTER THREE: METHODS

Overview

The purpose of this quantitative, predictive-corelational study was to explore whether a significant predictive relationship exists between the predictor variables (course structure, gender, race, socioeconomic status, integration scores, and high school achievement) and the criterion variables of post-test integration score and rate of reenrollment. The first section includes a detailed description and justification for the predictive-correlational design chosen for this study. Following that are the research questions and corresponding hypotheses. The second section contains a description of the participants and setting, including the population from which the sample is drawn. Finally, the instrumentation, procedures, and data analysis sections cover the data collection process and subsequent statistical analyses.

Design

This study utilized a quantitative, predictive-correlational design. The correlational design was appropriate because this study sought to examine the influence of several variables on a specific outcome, and correlations allow researchers to describe the relationship between one or more predictor variable and one or more criterion variable (Gall et al., 2015). Additionally, correlational designs are useful when the variables cannot be manipulated and allows researchers to predict the likelihood that a participant will take a specific future action (Gall et al., 2015). A correlational design is particularly useful in educational studies such as this one because it permits the analysis of a large number of variables in a single study, considering the degree of relationship between individual variables as well as collectively (Gall et al., 2007).

Predictor Variables

An exhaustive search of the relevant literature led to the selection of important determinants of student dropout. All the chosen predictor variables were measured prior to the outcome/criterion variables (Gall et al., 2007). The predictor variables for both research questions were course structure (HIP vs. non-HIP), integration score, gender, SES, and high school achievement. The predictor variable of race was included in RQ1 only.

Courses utilizing HIP pedagogy are characterized by eight qualities:

- performance expectations set at appropriately high levels
- significant investment of time and effort by students over an extended period of time
- interactions with faculty and peers about substantive matters
- experiences with diversity
- frequent, timely, and constructive feedback
- periodic, structured opportunities to reflect and integrate learning
- opportunities to discover relevance of learning through real-world applications
- public demonstration of competence (Kuh & O'Donnell, 2013, pp. 7-8).

Integration is defined by Tinto (1975, 1993) as the level of congruence (shared values) between the student and the institution and was measured as a continuous variable with the Institutional Integration Scale (Pascarella & Terezini, 1980). A pre-posttest design was used to collect participants' measures of integration. Gender was defined as the student's legal gender or the gender assigned at birth (Lindqvist et al., 2021). Race was defined as the five categories established by the United States Office of Management and Budget in its Standards for the Classification of Federal Data on Race and Ethnicity (Revisions to the Standards, 1997): Black or African American, White, Asian, American Indian or Alaska Native, and Native Hawaiian or

other Pacific Islander. Socioeconomic status was defined as a composite score of household income and parents' levels of education (Stoecker et al., 1988). High school achievement was defined as the student's self-reported high school grade point average (GPA).

Criterion Variables

There were two outcome/criterion variables, one for each research question. Research question one used post-test integration score as its outcome. The outcome/criterion for research question two is reenrollment status, which is a categorical, dichotomous variable that is defined as the participant's decision to reenroll (or not reenroll) at the same institution the following semester based on institutional enrollment records approximately two weeks after the start of classes.

Research Question(s)

RQ1: How accurately can post-test integration scores be predicted from a linear combination of course structure, pre-test integration scores, gender, race, socioeconomic status, and high school achievement?

RQ2: How accurately can reenrollment status [binary] be predicted from a linear combination of course structure, pre- and post-test integration scores, gender, socioeconomic status, and high school achievement?

Hypotheses

$H_0$1: There is no significant predictive relationship between the criterion variable (post-test integration scores) and the linear combination of predictor variables (course structure, pre-test integration scores, gender, race, socioeconomic status, and high school achievement).

$H_0$2: There is no significant predictive relationship between the binary criterion variable (reenrollment status) and the linear combination of predictor variables (course structure, pre- and post-test integration scores, gender, socioeconomic status, and high school achievement).

Participants and Setting

The participants for this study were drawn from a convenience sample of undergraduate students at a regional, comprehensive, 4-year university during the fall semester of 2023. Located in a rural part of the southern United States, the institution has a Carnegie classification of R2 (doctoral university – high research activity). At the time of the study, the institution enrolled approximately 15,000 residential, commuter, and online students, and the student population was 64% female and 36% male with slightly more than half designated as first-generation. The student body was composed of 63% Caucasian, 22% Latino, 8% African-American, and 1% Asian students.

Participants

The sample included all students enrolled in face-to-face sections of government during fall 2023, a total of 1,392 students. See Table 3 for participant demographics.

Table 3

Participant Demographics

	n	%
Gender		
Male	98	33.8
Female	192	66.2
Ethnicity		

American Indian or Alaska Native	6	2.1
Asian	4	1.4
Black or African American	10	3.4
Native Hawaiian or other Pacific Islander	3	1.0
White	263	90.7
No Response	4	1.4

Within this sample, 737 students consented to participate in the first phase of data collection. One hundred and one students were excluded for failing to complete the entire pretest survey, and another 346 were excluded for not completing the posttest survey. The resulting sample consisted of 192 women (66.2%) and 98 men (33.8%) for a total of 290. This closely mirrored the institutional breakdown of 63.2% women and 36.8% men. The sample was also predominantly white (90.7%) with 3.4% African-American, and 1.4% Asian students. During the same period, the institutional demographic was similar with 85.7% white, 7.3% black or African American, and 1.3% Asian. According to Warner (2013), a minimum sample size for multiple regression should be the larger of $N > 50 + 8k$ and $N > 104 + k$, where N is the number of cases and k is the number of predictor variables. With six predictor variables in this study ($k = 6$), the minimum sample size should be 110 to detect medium effect sizes. For the second research question, Warner (2013) recommends a minimum sample size of 66 for binary logistic regression (Warner, 2013).

In studies with similar methodology and structure, the appropriate number of participants varied based upon the number of predictors, with many researchers using G*Power to conduct an a priori power analysis: 170 for 8 predictor variables (Orhan, 2022), 52 for 15 predictor

variables (Hunter & St. Peters, 2022), and 150 for 6 predictor variables (Mullen & Mariam, 2019). Gao et al. (2020) did not use G*Power but estimated a minimum sample size of ten times the number of variables. Despite the wide variation, the number of participants in this study (290) appears to exceed those of the extant literature.

Setting

The setting for the study is a regional, comprehensive, 4-year university during the fall semester of 2023. The sample will be drawn from students who enroll in either of two required, three-credit government courses. These two courses were selected because both have sections taught in a traditional format (primarily didactic) as well as sections that utilize HIPs. The traditional format sections were taught face-to-face by five faculty who utilized lecture as the principal method of instruction; some faculty provided visual aids (PowerPoint, writing on the board, or video clips) to supplement the lecture while others did not. Additionally, most of the traditional format sections relied heavily on two or three exams as the only source of assessment. In the traditional sections, class size ranged from 20 to 36 students and sessions were held once per week (150 minutes), twice per week (75 minutes), or three times per week (50 minutes).

The HIP sections utilized a different course structure and pedagogical techniques. Five faculty used HIP teaching pedagogy and all agreed to a common course structure. Each faculty member provided 75 minutes of direct instruction weekly, usually in some combination of lecture and discussion. The remaining 50 minutes of weekly instructional time were scheduled separately as a “lab” (also called breakout sessions) centered around a particular topic and led by undergraduate student leaders. Sessions with the faculty member were twice per week (50 minutes each) in large classes of 150 students. During registration, students had the ability to select a lecture section and could choose from a series of linked lab sections with a variety of

topics. Lab topics were provided in the registration materials. The lab topics are used to guide students in a semester long research project in which students connect concepts and knowledge acquired during the lecture sessions to a specific sub-topic of interest on which the student prepared either a paper or a poster presentation. All lab sections also participated in a culminating event at which students were expected to briefly present their findings to peers, faculty, or guests.

Instrumentation

The instrument used in this study is Pascarella and Terenzini's (1980) Institutional Integration Scales (IIS). The IIS was used to measure students' overall integration scores. See Appendix A for the instrument. Developed just five years after Tinto (1975) first published his theory of student departure, the IIS was intended to help improve empirical testing of Tinto's theory by providing researchers with a valid and reliable measure of the critical constructs from Tinto's theory (Pascarella & Terenzini, 1980). The entire instrument, or one or more subscales, have been utilized in persistence research for over forty years (Berger, 1997; Berger & Milem, 1999; Bray et al., 1999; Mannan, 2001; Fox, 1984; Terenzini et al., 1981). According to Breidenbach and French (2010), Pascarella and Terenzini's 1980 article describing the development of the IIS "has been cited over 2,390 times" and no another scale measuring integration has achieved the same level of scholarly acceptance (p. 340).

The IIS may be applied in at least two ways. First, the total score of all 30 items has been shown to have substantial predictive ability (Terenzini et al., 1981) with a Cronbach alpha reliability coefficient of $\alpha = 0.92$. Second, scores may be measured for each of the five subscales: peer-group interactions, interactions with faculty, faculty concern for student development and teaching, academic and intellectual development and institutional and goal commitments. The

subscales have Cronbach alpha reliability scores ranging from .71-.84 (see Table 1) (Pascarella & Terenzini, 1980, p. 66-67). Pascarella and Terenzini (1980) found the subscales to be only minimally correlated, suggesting that they are measuring distinct facets of integration. These scores represent acceptable levels of internal reliability (Gall et al., 2015).

Table 4

Institutional Integration Scale (IIS) Subscale Reliability

IIS scale	No. of items	Scale alpha
Scale I: Peer-group interactions	7	.84
Scale II: interactions with faculty	5	.83
Scale III: Faculty concern for student development and teaching	5	.82
Scale IV: Academic and intellectual development	7	.74
Scale V: Institutional and goal commitments	6	.71

The subscales represent the various components that make up the construct of integration. According to Tinto (1975, 1993, 1997), integration is represented by academic performance, intellectual development, peer and faculty interactions, value congruence, and individual commitments. The items developed for the IIS were designed to draw out these individual components. For example, the academic and intellectual development subscale includes such questions as “I am satisfied with the text of my intellectual development since enrolling in this university” and “I have performed academically as well as I anticipated I would.” Peer-group

interactions includes, “The student friendships I have developed at this university have been personally satisfying; interactions with faculty asks, “Since coming to this university I have developed a close, personal relationship with at least one faculty member; and faculty concern for student development and teaching includes, “Most faculty members I have had contact with are interested in helping students grow in more than just academic areas” (Pascarella & Terenzini, 1980, pp. 66-67).

The first four subscales occur within the context of the student’s institutional experiences. The fifth subscale, goal and institutional commitment, attempts to capture the particular attitudes that students bring with them to the institution. Tinto describes these as the “psychological orientations” a student has toward completing a college degree and toward the specific institution the student attends (Tinto, 1975, p. 93). Among the six questions for this subscale are, “It is important for me to graduate from college” and “It is important to me to graduate from this university” (Pascarella & Terenzini, 1980, p. 67).

The IIS initially contained 55 questions covering the five subscales (Pascarella & Terenzini, 1980) but was later reduced to 30 items. Each subscale contains between five and seven items scored on a five-point Likert-scale where 1 = strongly agree and 5 = strongly disagree (Pascarella & Terenzini, 1980; Terenzini et al., 1981). The combined possible score on the IIS ranges from 30 to 150 points; however, the combination of negatively and positively phrased items within the instrument reduces the range of extreme integration scores to 70 (highly integrated) and 110 (poorly integrated). For ease of discussion, negatively worded items were reverse scored in these analyses, so the maximum score of 150 would mean a student demonstrates very poor social and academic integration while a minimum score of 30 would indicate a student is highly integrated within the institutional environment. The IIS was

administered electronically and took approximately 10 minutes to complete. Permission to use the IIS for this study and to include the IIS in this manuscript was obtained from The Ohio University Press. See Appendix B for permission to use and reprint the instrument.

Procedures

Permission to conduct this study was obtained from the Liberty University Institutional Review Board. The approval letter can be found in Appendix E. An Institutional Review Board application was also submitted to the institution where the study will be carried out. See Appendix F for a copy of the approval letter. After approval was obtained, the researcher contacted each of the faculty members scheduled to teach a government course in the fall semester of 2023 to obtain permission to visit classes during the second or third week of the semester to administer the pretest and again during the twelfth or thirteenth week of the semester to administer the posttest.

Undergraduate student workers were utilized to visit individual classes. Prior to data collection, the researcher met with the student workers and provided a copy of the script that student workers read to the class describing the purpose of the study, options to consent or opt-out, and data security protocols. See Appendix G for a copy of the recruitment script. Beginning in the second week of classes, student workers attended the first fifteen minutes of scheduled government classes and read the script. Then the student worker projected the image of a QR code that took participants to the electronic survey administered through Qualtrics. During the first phase of data collection, participants completed the biographical/demographical survey and the IIS. Student workers returned to each class during the second phase of data collection, which took place during the twelfth or thirteenth week of the sixteen-week semester. The aforementioned steps were repeated with the student worker reading the script and then

presenting the QR code for participants to access the Qualtrics survey. In the second phase, students only completed the IIS. The third phase of data collection occurred during the spring semester of 2024. Participants' re-enrollment at the institution was determined by accessing institutional enrollment records approximately two weeks after the start of classes. Participants who were enrolled in at least one course during the spring 2024 semester were coded as re-enrolled.

Survey data was kept secure. Data was collected in Qualtrics, a secure, cloud-based survey tool which could only be accessed with the researcher's unique login credentials. When the data was exported for analysis in SPSS, data was stored on a password protected computer. Participants' identities were not shared, and all results were presented in aggregate form. The data will be kept on file for a period of five years after the completion of this research study.

Data Analysis

Data analysis included multivariate regression and binomial logistic regression for research questions one and two, respectively. Mutiple linear regression was the most appropriate statistical test for RQ1 because Tinto's (1997) model of student departure includes several variables that are believed to influence a student's decision to dropout (Warner, 2013). Standard multiple linear regression treats all predictors equally and assess the "predictive usefulness of each X_i predictor variable" while controlling for all the other predictor variables (Warner, 2013). A similar rationale applied to the use of regression analysis for RQ2; however, the presence of a dichotomous outcome variable in RQ2 made binomial logistic regression the more appropriate test. The regression model was capable of measuring the amount of variance in the criterion variable attributed to the linear combination of predictor variables as well as the amount of variance for each individual variable when statistically controlling for all the other predictor

variables. The predictor variables were continuous (pre-test integration scores, post-test integration scores) or categorical (course structure, gender, race, socioeconomic status, and high school GPA). The relationship between the predictor variables and the criterion variables was believed to be linear (Gall et al., 2007).

Data analysis for RQ1 required satisfying the eight assumptions of a multiple regression (Laerd, 2013). First, the criterion variable must be one variable measured on a continuous level (integration). Second, there must be two or more predictor variables of either continuous or categorical type. Research question one had one continuous criterion variable (post-test IIS score) and six predictor variables: five categorical (course structure, gender, race, socioeconomic status, and high school achievement) and one continuous (pre-test IIS score). The third assumption is independence of observations which was tested using the Durbin-Watson statistic. The assumption of linearity, assumption four, ensures that there is a linear relationship between the criterion variable and the predictor variables collectively as well as between the criterion variable and each individual predictor variable. Linearity between the criterion variable (post-test ISS scores) and the only continuous predictor variable (pre-test IIS score) was tested with a visual inspection of a partial regression scatterplot while a scatterplot of studentized residuals against the predicted values was used to ensure linearity between the criterion variable and the predictor variables collectively.

Fifth, the assumption of homoscedasticity was tested through a visual inspection of the same scatterplot of the studentized residuals with the unstandardized predicted values that was used to test for linearity. Multicollinearity, assumption six, represents the presence of a correlation between predictor variables. Inspection of correlation coefficients and Tolerance/VIF values were used to test for possible multicollinearity, and casewise diagnositics was used to

highlight any significant outliers (assumption seven). The final assumption, normal distribution of residuals, was tested through visual inspection of the P-P Plot. The *p*- statistic was reported at the alpha level of .05 and the coefficient of determination (R^2) was used to measure effect size.

Binomial logistic regression was used to test RQ2. Research question two was similar to question one except the criterion variable in research question two was dichotomous, making logistic regression a more appropriate test (Gall et al., 2015). Binomial logistic regression requires satisfying seven assumptions. The first and second assumption are related to the study design. Binomial logistic regression is used to study the relationship between one or more predictor variables (categorical or continuous) and a criterion variable that is dichotomous (Gall et al., 2015). In RQ2, there were six predictor variables, a combination of continuous and categorical, and the dichotomous criterion variable was reenrollment, with participants coded as reenrolled or not reenrolled. The third assumption is independence of observations. For this study, participants were members of only one group within the outcome variable and any categorical predictor variables. Assumption four ensures an adequate sample size. Warner (2013) recommends no less than 10 times the number of predictor variables and no cells with frequencies <5; however, Laerd Statistics (2013) suggests a minimum of 15 cases for each predictor variable. Table 6 provides the frequencies for each predictor variable. Most predictor variables had more than 15 cases, and all variables had more than 5 except for ethnicity, resulting in its removal as a predictor variable.

The last three assumptions relate to how well the data fits the model. There must be a linear relationship between the continuous predictor variables and the logit transformation of the criterion variable. This study contained only one continuous predictor variable: post-test integration score, which was evaluated using the Box-Tidwell approach to ensure the assumption

of linearity was not violated. Sixth, the predictor variables also should not be highly correlated to each other. The Tolerance and VIF values were inspected to ensure there was no multicollinearity. The final assumption required detecting any significant outliers in the data with the casewise diagnostic tool in SPSS. The *p*- statistic was reported at the alpha level of .05 and both Cox & Snell R^2 and *Nagelkerke* R^2 were used to measure effect size.

CHAPTER FOUR: FINDINGS

Overview

The purpose of this study was to determine if a significant predictive relationship exists between the predictor variables (course structure, gender, race, socioeconomic status, integration scores, and high school achievement) and the criterion variables of post-test integration score and rate of reenrollment among postsecondary students at a comprehensive, regional university. This chapter provides descriptive statistics including the mean and standard deviation for the predictor and criterion variables, results of assumption testing for both the multivariate regression and binomial logistic regression tests, analysis of the findings, effect size, and conclusion to reject or fail to reject the null hypotheses.

Research Question(s)

RQ1: How accurately can post-test integration scores be predicted from a linear combination of course structure, pre-test integration scores, gender, race, socioeconomic status, and high school achievement?

During assumption testing, unsafe levels of multicollinearity were found in high school achievement, which prompted its removal from the analysis. This change is discussed further in the Results section and the revised RQ1 and $H_0 1$ are provided below.

RQ2: How accurately can reenrollment status [binary] be predicted from a linear combination of course structure, pre- and post-test integration scores, gender, race, socioeconomic status, and high school achievement?

During assumption testing, unsafe levels of multicollinearity were found in high school achievement, which prompted its removal from the analysis. Additionally, the extremely small

number of cases in the race variable necessitated its removal as well. These changes are discussed further in the Results section and the revised RQ2 and $H_0$2 are provided below.

Revised Research Question(s)

RQ1: How accurately can post-test integration scores be predicted from a linear combination of course structure, pre-test integration scores, gender, race, and socioeconomic status?

RQ2: How accurately can reenrollment status [binary] be predicted from a linear combination of course structure, pre- and post-test integration scores, gender, and socioeconomic status?

Revised Hypotheses

$H_0$1: There is no significant predictive relationship between the criterion variable (post-test integration scores) and the linear combination of predictor variables (course structure, pre-test integration scores, gender, race, and socioeconomic status).

$H_0$2: There is no significant predictive relationship between the binary criterion variable (reenrollment status) and the linear combination of predictor variables (course structure, pre- and post-test integration scores, gender, and socioeconomic status).

Descriptive Statistics

Data for the study's variables are summarized in Table 5 and Table 6. Two hundred ninety participants completed both the pre- and post-test administrations of the Institutional Integration Survey (IIS). After data screening procedures and assumption testing, 287 participants remained. The IIS score was the study's only continuous variable. The pre-test administration revealed a mean score of 84.9 with minimum and maximum scores of 63 and 123. The post-test administration showed a mean score of 84.7 with minimum and maximum scores

of 66 and 123.

Table 5

Descriptive Statistics of Institutional Integration Scale

	N	Minimum	Maximum	*M*	*SD*
IIS_Sum1_Adj	287	63.0	123.0	84.9	8.3
IIS_Sum2_Adj	287	66.0	123.0	84.7	9.3

Frequencies for the categorical predictor variables are provided in Table 6. Two of the predictor variables, gender and ethnicity were discussed in Chapter 3 (See Table 3). The remaining three predictor variables are course structure, high school GPA, and socioeconomic status. In course structure, the number of study participants enrolled in the high-impact government courses (63.6%) was slightly lower than the general population of students (69.9%) during the fall 2023 semester. It is more difficult to draw comparisons between the sample and the population on high school GPA and socioeconomic status because the institution does not directly report an institutional aggregate for either of these two variables; however, it is possible to estimate the population using available data. For example, third-party sources report an average institutional GPA of 3.21-3.26 among those admitted to the institution (CollegeSimply, n.d.; PrepScholar, n.d.). This is reasonably close to the 3.15 GPA average, which can be extrapolated from participant's responses. Likewise, a possible proxy for socioeconomic status within the population would be percentage of Pell Grant recipients. The institution reports that almost 40% of enrollees are Pell Grant recipients (Tarleton State University, 2023) as compared to 21.6%, 52.3%, and 24.7% of study participants who were categorized as socioeconomically low, medium, and high respectively.

Table 6

Frequency Table of Categorical Predictorl Variables

	n	%
Course Structure		
HIP	183	63.7
Non-HIP	104	36.3
High School Grade Point Average (GPA)		
2.0-2.99	18	6.3
3.0-3.99	205	71.4
4.0+	62	21.6
No Response	2	0.7
Socioeconomic Status		
Low	62	21.6
Medium	150	52.3
High	71	24.7
No Response	4	1.4

Results

Revised Hypothesis 1

Data Screening

Data screening for standard multiple regression was conducted on all predictor and criterion variables to remove erroneous data, address incomplete cases, and identify extreme cases (Mertler & Vannatta, 2005). First, the data were reviewed for missing values. Any

participants who failed to answer one of the 30 items, which made up the pre- or post-test IIS survey, were eliminated. This study analyzed IIS data as a composite score. Thus, any individual missing values would skew the composite results and could not be included. Next, data were reviewed for unusual results. One case was eliminated because the participant answered every question with "1" (strongly agree). Since the most likely reason was lack of fidelity on the part of the participant, the case was eliminated. Finally, missing values for other variables were identified and corrected where possible. For example, one participant indicated a high school GPA of 1.0–1.99, which was corrected to 3.0–3.99 after checking student records. A more detailed inspection for outliers was conducted during the assumption testing.

Assumptions

Standard multiple regression requires satisfying several assumptions to ensure that data are appropriate for this type of statistical test. Some scholars emphasize three assumptions: linearity, normality, and homoscedacticity (Meyers et al., 2006), others six (Cohen et al., 2003), and others expand the list to eight (Laerd, 2013; Mertler & Vannatta, 2005). The difference appears to depend on whether design choices are considered antecedent to the assumptions or listed among the assumptions. This study was guided by the list of eight assumptions provided by Laerd (2013). The first two assumptions were satisfied by the study design, which included a continuous criterion variable (post-test IIS score) and the presence of two or more predictor variables of either continuous or nominal type.

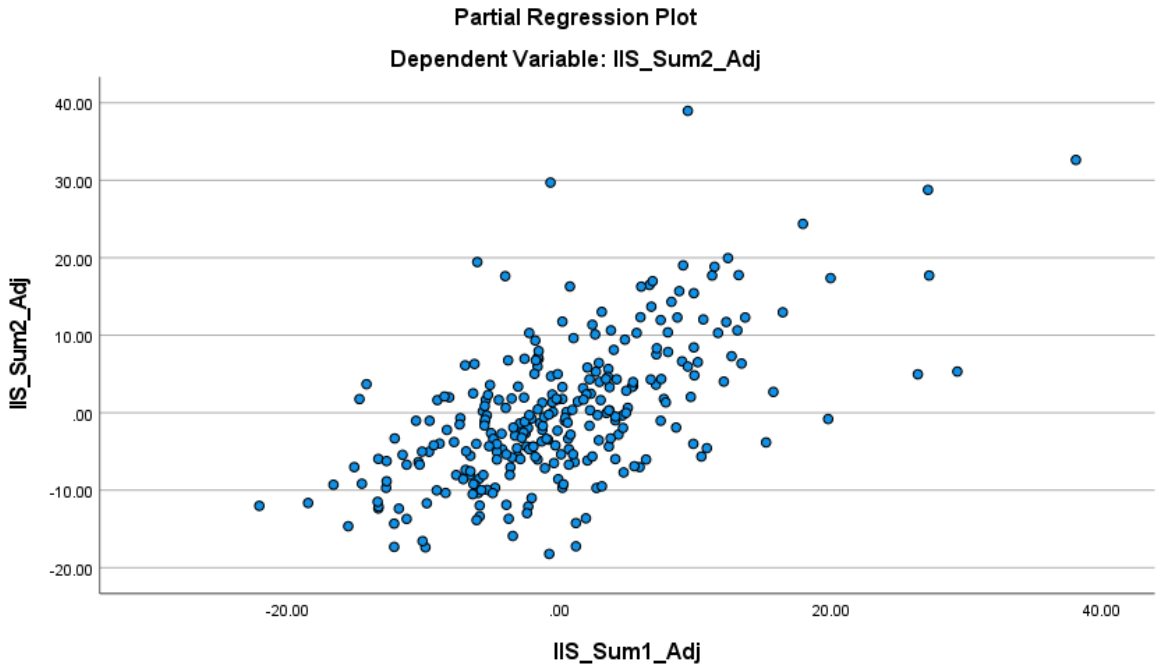
Independence of Observation. Multiple regression analysis assumes that each participant's measure is only counted once and has not influenced or been influenced by the measurement of another participant (Cohen et al., 2003). The current study design involved individual participants who completed the measure independently and were not subject to first-

order autocorrelation; however, the Durbin-Watson statistic was used to confirm independence of residuals (Cohen et al., 2003, Laerd, 2013). The Durbin-Watson statistic has a range of 0 to 4 with a value of 2 indicating there is no autocorrelation. The Durbin-Watson statistic for this study (2.29) was very close to 2 and indicates no autocorrelation.

Linearity. The assumption of linearity ensures that the predictor variables collectively are linearly related to the criterion variable and that there is a linear relationship between the criterion variable and each predictor variable (Meyers et al., 2006). When evaluating the linearity between the criterion variable and each predictor variable, only continuous variables are of concern (Laerd, 2013). Figure 6 is the partial regression plot for the single continuous predictor variable (IIS_Sum1_Adj) and the criterion variable (IIS_Sum2_Adj) and shows a linear relationship.

Figure 6

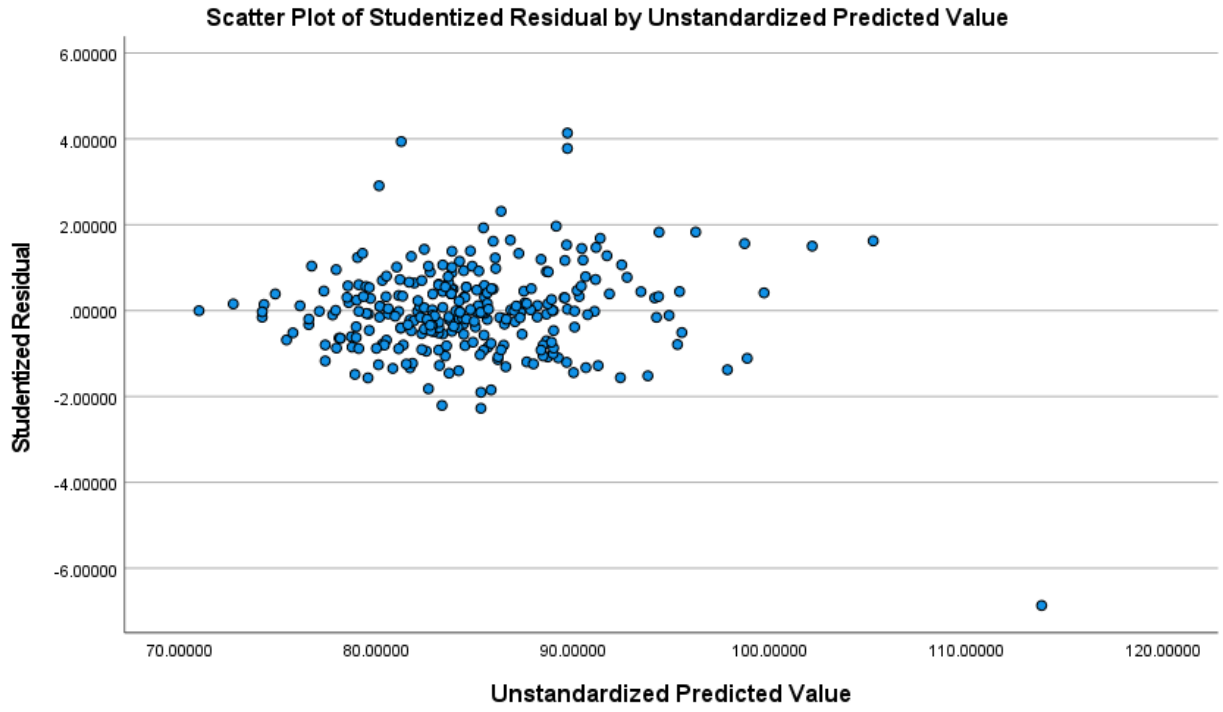
Scatterplot of Continuous Predictor Variable to Criterion Variable



To establish the linearity between the criterion variable and the predictor variables collectively, a scatterplot of the studentized residuals (y-axis) against the predicted values (x-axis) was used. Figure 7 shows a roughly horizontal band indicating a linear relationship.

Figure 7

Scatterplot of Studentized Residuals to Unstandardized Predicted Values



Homoscedasticity. The scatterplot in Figure 7 is also used to validate the fifth assumption in a multiple regression. Homoscedasticity assumes that the error term is the same across all predicted values (Licht, 1995; Mertler & Vannatta, 2005; Meyers et al., 2006). Visual inspection of Figure 7 validates the assumption of homoscedacticity with data points that are mostly equally spread across the predicted value. If this were not the case, the data points would

form an increasing or decreasing funnel shape across the unstandardized predicted value (Laerd, 2013).

Multicollinearity. In a multiple regression analysis, predictor variables should not be correlated with each other (Cohen et al., 2003; Licht, 1995). The presence of multicollinearity makes it difficult to determine the effect that a single variable has on the variance (Laerd, 2013; Meyers et al., 2006). The assumption of multicollinearity was assessed using the tolerance and variance inflation factor (VIF) values found in Table 7. These values are reciprocals of each other (Cohen et al., 2003). Tolerance values greater than 0.1 and VIP values of 1 indicate no violation of the assumption of multicollinearity (Laerd, 2013).

Tolerance and VIF values for high school GPA, socioeconomic status, and most ethnicities showed unsafe levels of first-order correlation. To resolve the problem, three steps were taken. First, given the relatively weak influence reported for high school GPA (Terenzini & Pascarella, 1978), the variable was removed from the analysis. Second, SES had originally been calculated as a continuous variable using a combination of parental income and parental education. The SES data were then converted to a categorical variable with three groups (low, middle, and high SES) prior to assumption testing. When the analysis was re-run using the continuous variable for SES, the assumption was satisfied. Third, ethnicity, was reduced from five groups to only two (White or not-White). The tolerance and VIF values, after these three adjustments were made, can be found in Table 7 and indicate the absence of multicollinearity in the data.

Table 7

Tolerance/VIF Values[a] in Multiple Regression Analysis

	Collinearity Statistics	
Model	Tolerance	VIF
IIS_Sum1	0.97	1.03
Gender=Female	0.96	1.04
TownHall=Yes	0.99	1.01
Ethnicity=White	0.93	1.07
SES_Total	0.91	1.11

a. Criterion Variable: IIS_Sum2

Unusual Points. In addition to the visual inspection conducted during data screening, three additional tests were used to identify data points that did not follow the typical pattern. First, a Casewise Diagnostic table was used to identify cases with a standard deviation greater than ±3. Four cases were identified. Upon further examination, two cases were determined to have errors that required their removal from the data set. The remaining two cases did not demonstrate any error or otherwise unusual pattern that merited removing them from the data set and were retained. In addition to examining the standardized residuals in the Casewise Diagnostic, the studentized deleted residuals were also examined for cases with a standard deviation greater than ±3. The same two outliers that were retained in the data set were reported having a standard deviation greater than ±3 (3.84 and 4.25). The two outliers were kept in the data set and were assessed for leverage points and influence points.

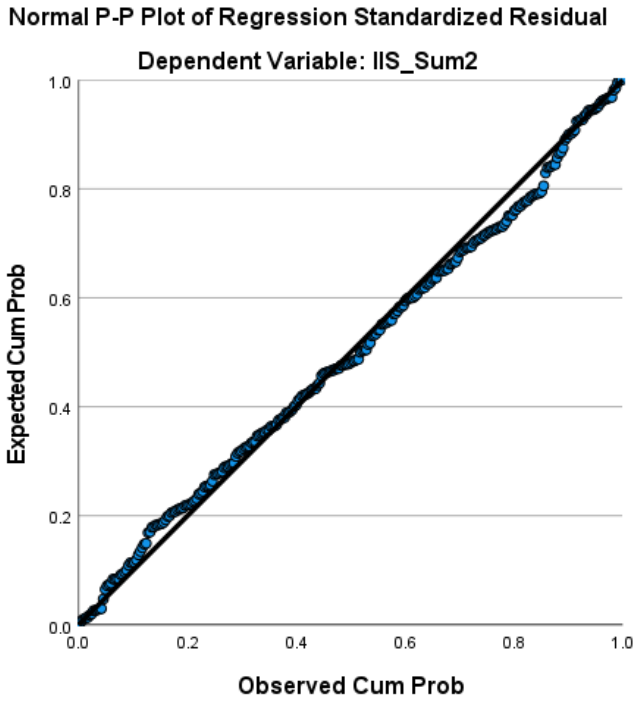
Leverage points are data points that have an inflated or extreme predictor value based on how far a case value is from the mean (Cohen et al., 2003). Data points with leverage values of .2 or less are safe while those with values between .2 and .5 are risky, and those with values above .5 are considered dangerous (Laerd, 2013). In this data set, SPSS identified seven cases with leverage point values between .2 and .5 indicating moderate risk that the data points would inflate the strength of the regression relationship. All seven data points were examined for error or unusual characteristics but none were found. Consequently, all seven data points were retained and assessed for influence.

In a multiple regression analysis, influential points are those that disproportionately influence the regression analysis (Cohen et al., 2003; Laerd, 2013). In this study, influential points were assessed using Cook's Distance values. There were no Cook's Distance values above 1, which indicated no further need for investigation.

Normality. The assumption of normality was tested using a P-P plot to visually examine the errors in prediction and ensure that they were normally distributed. Figure 8 shows a P-P plot of standardized residuals for the criterion variable (ISS_Sum2). Although not perfectly aligned, the data points form an approximately straight line confirming the assumption of normality.

Figure 8

P-P Plot of IIS_Sum2 (criterion variable) Standardized Residuals



Standard Mutiple Regression Statistic

Standard multiple regression was used to test if the combination of predictor variables (course structure, pre-test integration scores, gender, and socioeconomic status) significantly predicted the criterion variable (post-test IIS score). Table 8 contains the regression analysis output and measures how well the model fits the data. The Pearson correlation coefficient (*R*) measures the correlation between the actual IIS scores taken during the post-test administration and the predicted ISS scores based upon the regression model. A value of .597 reflects a strong positive correlation within the behavioral sciences (Cohen, 1988, p. 80).

Table 8

Model Summary[b] in Multiple Regression Analysis

Model	*R*	R^2	Adjusted R^2	*SE*
1	.622[a]	.39	.38	7.32

[a.] Predictors: (Constant), Ethnicity=White, IIS_Sum1, TownHall=Yes, Gender=Female, SES_Total

[b.] Criterion variable: IIS_Sum2

Two additional measures of the strength of the linear relationship, are the coefficient of determination (R^2) and the adjusted R^2 also found in Table 8. These two numbers represent the proportion of variance in the criterion variable (IIS_Sum2) accounted for by the combination of predictor variables. The R^2 value represents the proportion of variance based on the sample while the adjusted R^2 value represents the proportion of variance expected in the population. R^2 for the overall model was 38.6% with an adjusted R^2 of 37.5%, a large effect size according to Cohen (1988).

Table 9 reports the overall fit of the regression model. The results indicate that the regression model including gender, race, class format, pre-test scores, and socioeconomic status was statistically significantly better at predicting the post-test IIS scores (IIS_Sum2) than the mean model, $F(5, 277) = 34.87$, $p < .001$.

Table 9

ANOVA[a] Table for Multiple Regression Analysis

Model		*SS*	*Df*	*MS*	*F*	Sig.
1	Regression	9349.49	5	1869.89	34.87	<.001[b]
	Residual	14854.17	277	53.63		
	Total	24203.66	282			

[a.] Criterion Variable: IIS_Sum2_Adj

[b.] Predictors: (Constant), SES_Total, Ethnicity=White, IIS_Sum1, TownHall=Yes, Gender=Female

Table 10 shows the value for each predictor variable and represents the change in the criterion variable (IIS_Sum2_Adj) for a one unit change in any continuous predictor variable when all other criterion variables are held constant. There was a single continuous predictor variable (pre-test IIS) with a coefficient of 0.68. Thus, for each unit (point) on the pre-test IIS, the post-test score increases by 0.68, which is a statistically significant result. The pre-test IIS was the only predictor variable to contribute in a statistically significant way to the prediction of the post-test IIS score. All remaining predictor variables were nominal and none statistically significantly predicted the post-test score; nevertheless, $H_0 1$ was rejected.

Table 10

Coefficients[a] for the Multiple Regression Analysis

Model		Unstandardized Coefficients		*t*	Sig.	95.0% Confidence Interval for B	
		B	*SE*			Lower Bound	Upper Bound
1	(Constant)	25.16	4.92	5.12	<.001	15.48	34.85
	IIS_Sum1_Adj	0.68	0.05	12.92	<.001	0.58	0.79
	Gender=Female	0.22	0.94	0.23	0.82	-1.64	2.07
	TownHall=Yes	0.71	0.91	0.78	0.44	-1.09	2.51
	Ethnicity=White	0.23	1.56	0.15	0.88	-2.84	3.30
	SES_Total	0.08	0.15	0.49	0.62	-0.23	0.38

a. Criterion Variable: ISS_Sum2_Adj

Revised Hypothesis 2

Data Screening

No additional data screening was required for the binomial logistic regression used to test the second hypothesis; logistic regression is very similar to a standard regression, so the previous data screening was adequate for both tests.

Assumptions

To ensure that binomial logistic regression is an appropriate test for the dataset, seven assumptions must be met (Laerd, 2013), four are related to the study design and the remaining three focus on the data. The first assumption is the criterion variable must be dichotomous, and the second assumption requires one or more predictor variables of the continuous or nominal type (Meyers et al., 2006). Hypothesis two examined whether there was a significant predictive relationship between re-enrollment status (dichotomous criterion variable) and the linear

combination of six predictor variables (course structure, pre- and post-test integration scores, gender, and socioeconomic status), satisfying the first and second assumptions. The third assumption requires independence of observations, meaning that the nominal variables are not related to each other or any other category. In this study, the criterion variable and all nominal predictor variables are independent, meaning it is only possible for a participant to be placed in one category and in only one level of each category. The fourth assumption deals with the sample size (Laerd, 2013). Logistic regression requires a larger sample than linear regression (Meyers et al., 2006). Long (1997) recommends no less than 100 cases with a minimum of 10 cases per variable while Laerd (2013) suggests a minimum of 15 cases for each predictor variable. The sample size (287) exceeded the minimum recommendation and all predictor variables were represented by at least 15 cases except ethnicity (see Table 3), which was subsequently deleted from the analysis. The remaining three assumptions analyze the data for multicollinearity, linearity, and outliers.

Multicollinearity. The fifth assumption asserts that predictor variables should not be correlated with each other (Meyers et al., 2006). The presence of multicollinearity makes it difficult to determine the effect that a single variable has on the variance (Mertler & Vannatta, 2005). The assumption of multicollinearity was assessed using the tolerance and variance inflation factor (VIF) values. Tolerance and VIF values for high school GPA and socioeconomic status showed unsafe levels of first-order correlation. To resolve the problem, the continuous scale for SES was used rather than the three dummy coded levels of low, middle, and high SES. Additionally, given the relatively weak influence reported for high school GPA (Terenzini & Pascarella, 1978), all levels of GPA were removed. Subsequent testing showed tolerance values

greater than 0.1 and VIP values of 1 indicate no violation of the assumption of multicollinearity (see Table 11).

Table 11

Tolerance/VIF Values[a] in Logistic Regression Analysis

	Collinearity Statistics	
Model	Tolerance	VIF
IIS_Sum1_Adj	.61	1.63
IIS_Sum2_Adj	.61	1.63
Gender=Male	.97	1.03
TownHall=Yes	.99	1.01
SES_Total	.96	1.04

[a.] Criterion Variable: Reenrolled=Yes

Linearity. The sixth assumption is the assumption of linearity between the continuous predictor variables and the logit of the criterion variable was tested using the Box-Tidwell procedure. A Bonferroni correction was applied based on all terms in the model, resulting in statistical significance being accepted when $p < .006$ (Tabachnick & Fidell, 2014). Based on this assessment, all continuous predictor variables were found to be linearly related to the logit of the criterion variable.

Outliers. The seventh assumption examines for the presence of extreme values. The presence of outliers was assessed with the Casewise list which compares standardized residuals and highlights any cases with greater than ±2 standard deviations. There were 14 cases identified

with a standard deviation ±2. Each case was examined, but no error could be detected, and the cases were kept in the analysis.

Binomial Logistic Regression Statistic

A binomial logistic regression was performed to ascertain the effects of course structure, pre- and post-test integration scores, gender, and socioeconomic status on the likelihood that participants would reenroll at the same institution the following semester. The logistic regression model showed that the model was a good fit (Hosmer and Lemeshow $p = .40$) but was not statistically significant, $\chi^2(5) = 5.883$, $p = .318$. The model explained 6% of the variance (Nagelkerke R^2) in re-enrollment. The baseline model correctly classified 95.0% of cases by simply assuming the student would reenroll, and none of the predictor variables statistically significantly predicted re-enrollment. Consequently, sensitivity was 0% and specificity was 100.0%; positive predictive value was 95.0%, and negative predictive value was 0%. Given these findings, the researcher failed to reject $H_0 2$.

CHAPTER FIVE: CONCLUSIONS

Overview

This chapter contains four sections: discussion, implications, limitations, and recommendations. The discussion section presents the purpose of the study, a restatement of the two hypotheses, and the study's findings within the context of the related literature and theoretical framework. The next section considers how this study has contributed to the body of knowledge on student attrition and may help inform decision-making among higher education administrators. The section on limitations addresses weaknesses of this study, and the final section includes recommendations for further research.

Discussion

The purpose of this study was to determine if a significant predictive relationship exists between the linear combination of predictor variables (course structure, gender, race, socioeconomic status, integration scores, and high school achievement) and the criterion variables of post-test integration score and rate of re-enrollment among postsecondary students at a comprehensive, regional university. While there have been many studies that considered various combinations of predictor variables (Braxton, Milem, & Shaw Sullivan, 2000; Loes et al., 2017; McDaniel & Van Jura, 2020; Pascarella & Terenzini, 1979; Stage, 1989; Stoecker et al., 1988), this study included the unique addition of course structure as a predictor variable.

Hypotheses

$H_0$1: There is no significant predictive relationship between the criterion variable (post-test integration scores) and the linear combination of predictor variables (course structure, pre-test integration scores, gender, race, and socioeconomic status).

$H_0$2: There is no significant predictive relationship between the binary criterion variable (reenrollment status) and the linear combination of predictor variables (course structure, pre- and post-test integration scores, gender, and socioeconomic status).

Revised Hypothesis 1

The null hypothesis that there was no significant predictive relationship between the criterion variable (post-test IIS score) and the predictor variables (course structure, pre-test integration scores, gender, race, and socioeconomic status) was rejected. This was largely due to the presence of the pre-test IIS scores as a predictor variable. When the pre-test IIS scores were removed, the remaining predictor variables (gender, race, course structure, and socioeconomic status) accounted for 1% of the variance in post-test IIS scores. Only pre-test IIS scores were a statistically significant predictor of post-test IIS scores. This is consistent with findings by Terenzini and Pascarella (1978), who analyzed the influence that gender, race, high school achievement, and five additional pre-entry attributes, had on student attrition. Although Terenzini and Pascarella were investigating a different criterion variable (attrition), the IIS has moderate discriminating power in predicting student attrition (80.8 – 81.7% accuracy) (Pascarella & Terenzini, 1980). Therefore, it is likely that the pre-entry attributes found to account for only 3.6% of the variance in attrition (Terenzini & Pascarella, 1978) would likewise have a weak influence on post-test IIS scores.

The unique variable of interest to this study, high-impact course structure, contributed no statistically significant predictive value; however, mean scores on the post-test IIS were slightly lower for students enrolled in the high-impact courses and the lowest scores in the sample (indicating highest integration) were found among those enrolled in the HIP course. The literature on high-impact practices (HIP) reports a significant correlation between HIPs and

increased GPA in the first year (Kuh, 2008). Shi et al. (2023) also found that participation in HIPs had a significantly positive effect on student engagement and overall satisfaction. McClellan et al. (2021) also found that HIPs were associated with "some level of improved student engagement or learning" (p. 688). Student participation in HIPs falls within the third stage of Tinto's (1993) model as part of a student's institutional experiences (See Figure 3). As such, HIPs would contribute to the influence that a student's institutional experiences have on the student's level of integration at the institution. Thus, this study hypothesized that student participation in a high-impact educational experience (course structure) would result in lower integration scores on the post-test IIS than those who did not participate in the HIP course structure. This was the result, but not to a statistically significant extent.

There are several possible reasons for the weak results. First, there may have been additional variables that this study did not take into account such as student classification (freshman, sophomore, junior, or senior) or other unique characteristics such as student athletes or students enrolled in honors programs. For example, while the participant group as a whole was representative of the institutional population, sub-categories of students, such as those described above, may not have been equally distributed across the variable of interest (course structure), which could have skewed the results. Second, the high impact course structure being measured, was delivered by five different faculty members. While all faculty members implemented elements common to the HIP pedagogy, there were no doubt differences in the quality of instruction, number and quality of student-faculty interactions, and other factors related to teaching behaviors, that could have negatively impacted the quality of the student's experience in the HIP course.

One final possibility would be that HIP pedagogy does not have a direct impact on student integration as hypothesized in this study. Instead, there may be a mediating variable that was unaccounted for. For example, HIP pedagogy may increase students' intrapersonal motivation or quality of effort, or some combination of the two, which subsequently influences levels of integration.

Revised Hypothesis 2

The null hypothesis that there was no significant predictive relationship between the predictor variables (course structure, pre- and post-test integration scores, gender, and socioeconomic status) and the criterion variable (persistence) was not rejected. These findings are partially consistent with earlier studies. With respect to the predictor variables that would be characterized as pre-entry attributes (gender and SES), the lack of predictive value is supported in the literature by Terenzini and Pascarella (1978), who found that a set of eight pre-entry attributes, including gender, accounted for just 3.6% of the variance in persistence and were not statistically significantly related to the students' decision to drop out. In another study, Kohen et al. (1978) included SES among the four pre-entry attributes in their study and found that it had no independent effect on persistence. Thus, the lack of a predictive relationship between gender, SES and persistence is consistent with extant literature.

As to the pre-test and post-test Institutional Integration Scales (IIS) scores, this study found that neither was a significant predictor of retention. This lack of statistical significance is inconsistent with prior literature, which has supported the predictive power of the IIS (Perry et al., 1999; Terenzini et al., 1981). One reason for this result could be the small number of dropouts ($n = 14$) in the sample ($N = 287$). Although recommendations on sample size vary, there is generally consensus that binomial logistic regression requires a large sample size (Laerd,

2013; Long, 1997). Peduzzi et al. (1996) recommend that any formula for calculating sample size should consider the frequency of the outcome. Using the frequency of drop out in this sample, Peduzzi et al. would have recommended a sample size four times larger for this analysis. The sample size in the study would have been more appropriate if the measure of persistence had been fall-to-fall, which typically has a much higher drop out rate than the fall-to-spring measure that was used in this study. Table 12 contains the demographic breakdown of the sample drop outs.

Table 12

Demographics of Dropouts in Sample

	Dropped out	
	No.	% of total in sample
Male	4	.04
Female	10	.05
HIP Participant	12	.06
Non-HIP Participant	2	.02
GPA_2 (2.0-2.99)	1	.05
GPA_3 (3.0-3.99)	11	.05
GPA_4 (4.0+)	2	.03
SES_Low	3	.05
SES_Middle	10	.05
SES_High	1	.03
Freshmen	3	.04

Sophomore	6	.04
Junior	3	.04
Senior	0	.00

The remaining predictor variable, course structure, likewise, was found to make no significant contribution to predicting retention. As noted in Table 12, the proportion of drop outs was higher among HIP participants than non-HIP participants, but this should not be interpreted as a negative relationship between HIP participation and persistence. The result could be due to the presence of confounding variables such as student classification or characteristic or variation among the HIP courses themselves as noted above. The course structure variable also could have been negatively impacted by the small *n* among participants who dropped out. It is worth noting that the model for hypothesis two was a good fit despite not being statistically significant.

Implications

The rising costs of a college education coupled with decreasing financial support from state and local governments and increased demands by employers for a skilled labor force have renewed public scrutiny on retention in higher education. Despite almost a century of research, gaps in the literature persist regarding how and why students drop out of college. This study raises important questions about a) whether Tinto's (1997) model is equally applicable to all types of drop out and all classes of student and b) whether the influence of HIPs on integration and persistence may be enhanced by the passage of time.

Institutional Integration Scale

This appears to be the only study where the IIS was administered to classes of students other than freshmen, and the results suggest some interesting implications for the IIS and Tinto's

(1997) model. A closer examination of mean scores on the IIS by student classification (freshman, sophomore, junior, senior) showed that freshment and sophomores had the lowest integration, while juniors had the highest, with integration falling slightly among seniors. This suggests that students become more integrated into the institutional community the longer they persist, affirming Tinto's (1997) model of student departure, which posits that students' levels of pre-entry integration change over time as a result of institutional experiences (See Figure 3). The slight decline in integration once students reach their senior year could be attributed to the natural withdrawal from the institutional community as students prepare to graduate and venture out into the workforce. Alternatively, it could point to what Mabel and Britton (2018) call the "late departure phenomenon" (p. 36), referring to students who drop out after accumulating a significant portion of the credits needed for graduation. This raises important questions about possible differences between early and late dropouts and whether the IIS is equally effective at predicting both types of drop out or if the IIS and Tinto's model (1997) by extension, are focused on experiences and issues more relevant to early dropouts. Tinto (1982a) himself acknowledged that "the character of early college dropout is generally quite different from dropout occurring in the later years" (p. 8).

High Impact Practices

Tinto (1997) elevated the importance of classroom experiences in the 1997 revisions to his model of student departure, placing it at the center of a student's institutional experiences, literally (See Figure 3) and figuratively. The failure of course structure (HIP) to have a statistically significant influence on integration and persistence should not be interpreted as minimizing the importance of classroom experiences. Instead, the results affirm the complexity

of retention research and the design challenges posed by studying a unique, institutionally-developed HIP within a single academic year.

Despite the lack of statistical significance, post-test IIS scores did show that students enrolled in HIP sections were slightly more integrated at the end of the course than those enrolled in non-HIP section, suggesting a lower risk of drop out among HIP participants. This is consistent with Tinto's (1997) model, which depicted the influence of classroom experiences on the academic and social integration of students, and leaves open the possibility that the HIP under study helped facilitate increased integration among the students enrolled.

The results also build on existing HIP research. Recent studies of first-year seminars (Everett, 2023), living-learning communities (Hines et al., 2023), and undergraduate research (Bernstein & Lindsay, 2022) have explored the challenges and successes of more well-known HIPs. Other researchers are going beyond the traditional list of HIPs cited by Kuh (2008) to innovative programs like experiential philanthropy courses (Benenson, 2020), virtual exchange programs (Commander et al., 2022), and partnerships that allowed students to work as the field crew for a forensic recovery project (Kolpan & Passalacqua, 2023). This study fits in the later category, exploring a unique high-impact approach to teaching the subject of government.

The element of time also may have played a role in the study results. Tinto's (1997) model and the institutional experiences within it are temporal. The influence of classroom experiences on integration appear on the model as a simple black arrow (See Figure 3) with no indication of the period of time between the experiences and the effect of those experiences on student integration. Many studies of high-impact classroom experiences look at student persistence a year or more after participation. For example Andrews's (2018) study covered a period of 10 years, Provencher and Kassel (2019) looked at a two year period, and McDaniel and

Van Jura (2020) measured degree completion after eight years. The term of persistence for this study was fall-to-spring. Perhaps the benefit of HIP participation does not immediately result in greater institutional integration or lower persistence. Many of the active learning strategies inherent in HIPs are uncomfortable or unpleasant for students not accustomed to being actively involved in their own learning. Additionally, some HIPs may be time-intensive and take students away from other other types of institutional and social involvement. For both of these reasons, a measure of integration taken immediately after the conclusion of the HIP experience, as was the case in this study, may not reflect the anticipated benefits because the student has not had the opportunity to reflect on the experience and apply the newly acquired knowledge and skills. On the other hand, if the outcome were to be measured a year or more after the HIP experience, the student may better appreciate the added value of the HIP opportunity, which would likewise be reflected in a higher level of institutional integration and a lower risk of drop out.

Limitations

Several limitations impact the findings of this study. First and foremost, the study was conducted at a single institution and student experiences may or may not be representative of students at other institutions. Despite this being a weakness of the study, it is possibly the most appropriate type of research on Tinto's (1975, 1993, 1997) model 2004) since the model is intended to describe the "longitudinal process of interactions between *the* individual and *the* institution . . . in which he is registered" [emphasis added] (Tinto, 1975, p. 103). Another limitation was the use of convenience sampling rather than random sampling thereby impacting the generalizability of the findings. Random sampling was not possible for this study as is often the case with educational research (Gall et al., 2007). Because students self-selected either a HIP course section or non-HIP during the course registration period, the resulting sample may not not

accurately reflect the population. A third limitation was the use of a fall-to-spring measure of retention rather than the more commonly used fall-to-fall measure (Burke, 2019). While not ideal, scheduling conflicts and financial constraints of the research study precluded a fall to fall retention variable.

A fourth limitation may be the use of survey data. Regarding the Institutional Integration Scales specifically, the combination of positively and negatively phrased prompts may have caused students to make data entry errors in their Likert scale responses. As to surveys more generally, results are limited when respondents do not understand the question or when respondents' selections are based on which option appears more acceptable or favorable (Fowler, 2009). To address these potential errors, simple language was used throughout the survey and participants were allowed to respond to survey prompts confidentially on their personal, hand-held devices.

A fifth limitation is the research design. While there are many advantages to a predictive-correlational design, it is limited to measuring the strength and direction of the relationship between variables. A predictive-correlational design cannot explain the reason for the relationship nor can it determine which variable is the source of the influence (Gaille, 2020).

Recommendations for Future Research

This study examined a high impact educational practice at a single institution for possible association with institutional integration and retention. While the study may be limited in its generalizability, it contributed to the growing body of knowledge on HIPs and the contribution that classroom experiences may make to student retention. As institutions look for new ways to

engage students both socially and academically, the potential for research opportunities likewise grows. Specific opportunities for future research could include the following:

1. Repeat this study using a fall-to-fall retention period.
2. Repeat this study using degree completion as the outcome rather than year-over-year persistence.
3. Repeat the study using random sampling.
4. Examine the relationship of other high impact practices with integration and retention.
5. Consider the influence of high impact practices on student motivation and subsequent retention.
6. Conduct exploratory research on the factors in late departure drop outs.
7. Conduct studies that control for additional variables such as age, student classification, residential arrangements, or financial aid, which might contribute to a student's decision to persist or drop out.

REFERENCES

Aitken, N. D. (1982). College student performance, satisfaction and retention: Specification and estimation of a structural model. *The Journal of Higher Education, 53*(1), 32–50. https://doi.org/10.2307/1981537

Andrews, B. D. (2018). Delayed enrollment and student involvement: Linkages to college degree attainment. *The Journal of Higher Education, 89*(3), 368-396. https://doi.org/10.1080/00221546.2017.1390972

Astin, A. W. (1972). *College Dropouts: A national profile* (Research reports Volume 7, No. 1). American Council on Education. ERIC. https://files.eric.ed.gov/fulltext/ED059691.pdf

Astin, A. W. (1975). *Preventing students from dropping out*. Jossey-Bass.

Astin, A. W. (1999). Student involvement: A developmental theory for higher education. *Journal of College Student Development 40*(5), 518-529. (Reprinted from "Student involvement: A developmental theory for higher education," 1984, *Journal of College Student Personnel, 25*, 297-308.

Ashar, H., & Skenes, R. (1993). Can Tinto's student departure model be applied to nontraditional students? *Adult Education Quarterly 43*(2), 90-100. https://doi.org/10.1177/0741713693043002003

Babcock, P. S., & Marks, M. (2011). *The falling time cost of college: evidence from half a century of time use data* (Working Paper 15954). National Bureau of Economic Research. https://www.nber.org/papers/w15954

Barkley, E. F., Cross, P. K., & Howell Major, C. (2005). *Collaborative learning techniques: A handbook for college faculty*. John Wiley & Sons.

Bernstein, J. L., & Lindsay, H. A. (2022). A case study and vision: Supporting undergraduate research at Eastern Michigan University. *Journal of Student Affairs Research and Practice, 59*(3), 324-337. https://doi.org/10.1080/19496591.2021.1984932

Bastedo, M. N., Altbach, P. G., & Gumport, P. J. (2016). *American higher education in the 21st century: Social, political, and economic changes* (4th ed.). Johns Hopkins University Press.

Bean, J. P. (1980). Dropouts and turnover: The synthesis and test of a causal model of student attrition. *Research in Higher Education, 12*(2), 155-187. https://doi.org/10.1007/BF00976194

Benenson, J. (2020). What's past is prologue? the effect of gender, race, socioeconomic status, and prior nonprofit sector experiences on experiential philanthropy course outcomes. *Journal of Nonprofit Education and Leadership, 10*(2), 157-178. https://doi.org/10.18666/JNEL-2020-V10-I2-10177

Berger, J. B. (1997). Students' sense of community in residence halls, social integration, and first-year persistence. *Journal of College Student Development, 38*(5), 441.

Berger, J. B., & Milem, J. F. (1999). The role of student involvement and perceptions of integration in a causal model of student persistence. *Research in Higher Education, 40*(6), 641–664. https://doi.org/10.1023/A:1018708813711

Bers, T. H., & Smith, K. E. (1991). Persistence of community college students: The influence of student intent and academic and social integration. *Research in Higher Education, 32*(5), 539–556. https://doi.org/10.1007/BF00992627

Bloom, B. S. (1956). *Taxonomy of educational objectives: The classification of educational goals* (1st ed.). David McKay Company, Inc.

Bonwell, C. C., & Eison, J. A. (1991). *Active learning: Creating excitement in the classroom* (ASHE-ERIC Higher Education Report series, No. 1). The George Washington University, School of Education and Human Development.

Bray, N. J., Braxton, J. M., & Shaw Sullivan, A. (1999). The influence of stress-related coping strategies on college student departure decisions. *Journal of College Student Development, 40*(6), 645-657.

Braxton, J. M. (Ed.). (2000). *Reworking the student departure puzzle*. Vanderbilt University Press.

Braxton, J. M., Bray, N. J., & Berger, J. B. (2000). Faculty teaching skills and their influence on the college student departure process. *Journal of College Student Development, 41*(2), 215.

Braxton, J. M., Brier, E. M., & Steele, S. L. (2007). Shaping retention from research to practice. *Journal of College Student Retention: Research, Theory & Practice, 9*(3), 377-399. https://doi.org/10.2190/CS.9.3.g

Braxton, J. M., Jones, W. A., Hirschy, A. S., & Hartley III, H. V. (2008). The role of active learning in college student persistence. *New Directions for Teaching and Learning, 2008*(115), 71-83. https://doi.org/10.1002/tl.326

Braxton, J. M., Milem, J. F., & Shaw Sullivan, A. V. (2000). The influence of active learning on the college student departure process: Toward a revision of Tinto's theory. *The Journal of Higher Education (Columbus), 71*(5), 569-590. https://doi.org/10.1080/00221546.2000.11778853

Braxton, J. M., Shaw Sullivan, A. V., & Johnson, R. M. (1997). Appraising Tinto's theory of college student departure. In J. C. Smart (Ed.), *Higher education: Handbook of theory and research, Vol. 12* (pp. 107-164). Agathon Press.

Breidenbach, D. H., & French, B. F. (2010). Ordinal logistic regression to detect differential item functioning for gender in the Institutional Integration Scale. *Journal of College Student Retention 12*(3), 339-352. https://doi.org/10.2190/CS.12.3.e

Brinko, K. T. (1993). The practice of giving feedback to improve teaching: What is effective? *The Journal of Higher Education*, *64*(5), 574–593. https://doi.org/10.2307/2959994

Brint, S., & Cantwell, A. M. (2010). Undergraduate time use and academic outcomes: Results from the University of California Undergraduate Experience Survey 2006. *Teachers College Record 112*(9), 2441-2470. https://doi.org/10.1177/016146811011200908

Brown, M. (2021, February 17). *College dropouts and student debt*. LendEDU. https://lendedu.com/blog/college-dropouts-student-loan-debt/

Bull Schaefer, R. A., & Copeland, L. K. (2022). Performance reviews as an active method to improve feedback and performance. *Active Learning in Higher Education*, *0*(0). https://doi.org/10.1177/14697874221091898

Bureau of Labor Statistics. (2022, March 9). *High school graduates with no college had unemployment rate of 4.5 percent in February 2022.* https://www.bls.gov/opub/ted/2022/high-school-graduates-with-no-college-had-unemployment-rate-of-4-5-percent-in-february-2022.htm

Burke, A. (2019). Student retention models in higher education: A literature review. *College and University, 94*(2), 12-21.

Cabrera, A. F., Nora, A., & Castañeda, M. B. (1992). The role of finances in the persistence process: A structural model. *Research in Higher Education, 33*(5), 571–593. https://doi.org/10.1007/BF00973759

Chang, J. (2011). *A case study of the "Pygmalion effect": Teacher expectations and student achievement* (EJ1066376). ERIC. https://files.eric.ed.gov/fulltext/EJ1066376.pdf

Chickering, A. W., & Gamson, Z. F., (1987). Seven principles for good practice in undergraduate education. *AAHE Bulletin*, 3–7. https://files.eric.ed.gov/fulltext/ED282491.pdf

Cleveland-Innes, M. (1994). Adult student drop-out at post-secondary institutions. *Review of Higher Education, 17*(4), 423-445. https://doi.org/10.1353/rhe.1994.0011

Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences, 2nd Ed.* Routledge.

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Lawrence Erlbaum Associates.

CollegeSimply. (n.d.). Tarleton admission requirements. https://www.collegesimply.com/colleges/texas/tarleton-state-university/admission/

Commander, N. E., Schloer, W. F., & Cushing, S. T. (2022). Virtual exchange: A promising high-impact practice for developing intercultural effectiveness across disciplines. *Journal of Virtual Exchange, 5*, 1-19. https://doi.org/10.21827/jve.5.37329

Cox, B. E., & Orehovec, E. (2007). Faculty-student interaction outside the classroom: A typology from a residential college. *The Review of Higher Education, 30*(4), 343-362. https://doi.org/10.1353/rhe.2007.0033

Davis, T. M., & Murrell, P. H. (1993). A structural model of perceived academic, personal, and vocational gains related to college student responsibility. *Research in Higher Education 34*(3), 267-289. https://doi.org/10.1007/BF00991846

de Boer, H., Bosker, R. J., & van der Werf, M. P. C. (2010). Sustainability of teacher expectation bias effects on long-term student performance. *Journal of Educational Psychology*, *102*(1), 168–179. https://doi.org/10.1037/a0017289

Donovan, R. (1984). Path analysis of a theoretical model of persistence in higher education among low-income black youth. *Research in Higher Education, 21*(3), 243-259. https://doi.org/10.1007/BF00974861

Dwyer, T. (2017). Persistence in higher education through student-faculty interactions in the classroom of a commuter institution. *Innovations in Education and Teaching International, 54*(4), 325-334. https://doi.org/10.1080/14703297.2015.1112297

Erekson, O. H. (1992). Joint determination of college student achieve and effort: Implications for college teaching. *Research in Higher Education 33*(4), 433-446. https://doi.org/10.1007/BF00973765

Everett, M. K. (2023). "I never would have talked to this person": The power of an assignment to encourage engagement. *Christian Higher Education (London, UK), 22*(3-4), 212-230. https://doi.org/10.1080/15363759.2023.2219070

Fleming, N. D., & Mills, C. (1992). Not another inventory, rather a catalyst for reflection. *To Improve the Academy, 11*, 137-143. https://doi.org/10.1002/j.2334-4822.1992.tb00213.x

Fowler, F. J. (2009). Types of error in surveys. In *Survey Research Methods (4th ed.)* (4th ed., pp. 11-17). SAGE Publications. https://doi.org/10.4135/9781452230184.n2

Fox, R. N. (1984). Reliability and discriminant validity of Institutional Integration Scales for disadvantaged college students. *Educational and Psychological Measurement 44*(4), 1051-1057. https://doi.org/10.1177/0013164484444030

Furey, W. (2020). The stubborn myth of "Learning styles." *Education Next, 20*(3)

Gaille, L. (2020). *12 advantages and disadvantages of correlational research studies*. Vittana.org Personal Finance Blog. https://vittana.org/12-advantages-and-disadvantages-of-correlational-research-studies

Gall, M. D., Gall, J. P., & Borg, W. R. (2007). *Educational research: An introduction* (8th ed.). Pearson.

Gall, M. D., Gall, J. P., & Borg, W. R. (2015). *Applying educational research: How to read, do, and use research to solve problems of practice* (7th ed.). Pearson.

Gao, H., Hu, R., Yin, L., Yuan, X., Tang, H., Luo, L., Chen, M., Huang, D., Wang, Y., Yu, A., & Jiang, Z. (2020). Knowledge, attitudes and practices of the Chinese public with respect to coronavirus disease (COVID-19): an online cross-sectional survey. *BMC Public Health, 20*(1), 1816. https://doi.org/10.1186/s12889-020-09961-2

Garrison, D. R. (1985). Predicting dropout in adult basic education using interaction effects among school and nonschool variables. *Adult Education Quarterly, 36*(1), 25–38. https://doi.org/10.1177/0001848185036001003

Getzlaf, S. B., Sedlacek, G. M., Kearney, K. A., & Blackwell, J. M. (1984). Two types of voluntary undergraduate attrition: Application of Tinto's model. *Research in Higher Education, 20*(3), 257-268. https://doi.org/10.1007/BF00983501

Good, T. L., Sterzinger, N., & Lavigne, A. (2018). Expectation effects: Pygmalion and the initial 20 years of research. *Educational Research and Evaluation, 24*(3-5), 99-123, https://doi.org/10.1080/13803611.2018.1548817

Grosset, J. M. (1991). Patterns of integration, commitment, and student characteristics and retention among younger and older students. *Research in Higher Education, 32*(2), 159–178. https://doi.org/10.1007/BF00974435

Guillaume, D. W., & Khachikian, C. S. (2011). The effect of time-on-task on student grades and grade expectations. *Assessment & Evaluation in Higher Education, 36*(3), 251-261. https://www.doi.org/10.1080/02602930903311708

Hader, J. A. (2011). *William G. Spady, agent of change: An oral history* [Doctoral dissertation, Loyola University Chicago]. Loyola eCommons. https://ecommons.luc.edu/luc_diss/130

Hanson, M. (2022, June 17). *College dropout rates.* EducationData.org. https://educationdata.org/college-dropout-rates

Hattie, J. A. C., & Yates, G. C. R. (2016). Using feedback to promote learning. In V. A. Benassi, C. E. Overson, & C. M. Hakala (Eds.). *Applying science of learning in education: Infusing psychological science into the curriculum*. Society for the Teaching of Psychology. https://teachpsych.org/ebooks/asle2014/index.php

Hazard Munro, B. (1981). Dropouts from higher education: Path analysis of a national sample. *American Educational Research Journal, 18*(2), 133–141. https://doi.org/10.3102/00028312018002133

Hines, E. M., Moore, J. L., Cintron, D. W., & Singleton, P. (2023). A Bridge over troubled water: Designing and implementing a living-learning community to produce optimal

outcomes for black males. *Journal of College and University Student Housing, 49*(2), 66-85.

Hunter, L. K., & St. Peters, M. M. M. (2022). Self-efficacy, meta-cognitive strategies, & feedback on final grades in an introductory course. *North American Journal of Psychology, 24*(4), 727-742.

Indiana University, Center for Postsecondary Research [IU-CPR]. (n.d.a.). *Origins and potential of the National Survey of Student Engagement*. https://nsse.indiana.edu/nsse/about-nsse/general-nsse-info-facts/origins.html

Indiana University, Center for Postsecondary Research [IU-CPR]. (n.d.b.). *NSSE's conceptual framework (2013)*. https://nsse.indiana.edu/nsse/about-nsse/conceptual-framework/index.html

Jack Lam, Y. L. (1984). Predicting dropouts of university freshmen: A logit regression analysis. *Journal of Educational Administration, 22*(1), 74-82. https://doi.org/10.1108/eb009886

Johnson, D. W., Maruyama, G., Johnson, R., Nelson, D., & Skon, L. (1981). Effects of cooperative, competitive, and individualistic goal structures on achievement: A meta-analysis. *Psychological Bulletin 89*(1), 47-62. https://doi.org/10.1037/0033-2909.89.1.47

Johnson, J. B. (1926). Predicting success in college at time of entrance. *School & Society 23*, 82-88.

Johnson, S. R., & Stage, F. K. (2018). Academic engagement and student success: Do high-impact practices mean higher graduation rates? *The Journal of Higher Education 89*(5), 753-781. https://doi.org/10.1080/00221546.2018.1441107.

Joonas, K. (2016). The Pygmalion effect across academic levels in an HBCU: Reflections on service-learning experiences. *Journal of Higher Education Theory and Practice, 16*(2), 120-132.

Kilgo, C. A., Sheets, J. K. E., & Pascarella, E. T. (2015). The link between high-impact practices and student learning: Some longitudinal evidence. *Higher Education, 69*(4), 509-525. https://doi.org/10.1007/s10734-014-9788-z

Kirschner, P. A. (2017). Stop propagating the learning styles myth. *Computers and Education, 106*, 166-171. https://doi.org/10.1016/j.compedu.2016.12.006

Kluger, A. N., & DeNisi, A. (1996). The effects of feedback interventions on performance: a historical review, a meta-analysis, and a preliminary feedback intervention theory. *Psychological Bulletin, 119*(2), 254-284. https://doi.org/10.1037/0033-2909.119.2.254

Kohen, A. I., Nestel, G., & Karmas, C. (1978). Factors affecting individual persistence rates in undergraduate college programs. *American Educational Research Journal, 15*(2), 233-252. https://doi.org/10.3102/00028312015002233

Kolb, D. A., & Kolb, A. Y. (2013). *The Kolb Learning Style Inventory 4.0: Guide to theory, psychometrics, research & applications*. ResearchGate. https://www.researchgate.net/publication/303446688_The_Kolb_Learning_Style_Inventory_40_Guide_to_Theory_Psychometrics_Research_Applications

Kolpan, K. E., & Passalacqua, N. V. (2023). Forensic archeology as a high-impact practice. *Journal of Forensic Sciences, 68*(1), 233-241. https://doi.org/10.1111/1556-4029.15184

Kuh, G. D. (2001). Assessing what really matters to student learning inside the National Survey of Student Engagement. *Change: The Magazine of Higher Learning 33*(3), 10-17. https://doi.org/10.1080-00091380109601795

Kuh, G. D. (2003). What we're learning about student engagement from NSSE. *Change (New Rochelle, N.Y.), 35*(2), 24.

Kuh, G. D. (2008). *High-impact educational practices: What they are, who has access to them, and why they matter*. Association of American Colleges and Universities. https://www.aacu.org/publication/high-impact-educational-practices-what-they-are-who-has-access-to-them-and-why-they-matter

Kuh, G. D., Cruce, T. M., Shoup, R., Kinzie, J., & Gonyea, R. M. (2008). Unmasking the effects of student engagement on first-year college grades and persistence. *Journal of Higher Education, 79*(5), 540-563. https://doi.org/10.1353/jhe.0.0019

Kuh, G. D. & Hu, S. (2001). The effects of student-faculty interaction in the 1990s. *Review of Higher Education, 24*(3), 309-332. https://doi.org/10.1353/rhe.2001.0005

Kuh, G. D. & Kinzie, J. (2018, May 1). *What really makes a 'high-impact' practice high impact?* Inside Higher Ed. https://www.insidehighered.com/views/2018/05/01/kuh-and-kinzie-respond-essay-questioning-high-impact-practices-opinion

Kuh, G. D., & O'Donnell, K. (2013). *Ensuring quality & taking high-impact practices to scale.* Association of American Colleges and Universities. https://www.aacu.org/publication/ensuring-quality-and-taking-high-impact-practices-to-scale

Koljatic, M., & Kuh, G. D. (2001). A longitudinal assessment of college student engagement in good practices in undergraduate education. *Higher Education, 42*(3), 351-371. https://doi.org/10.1023/A:1017993113390

Laerd Statistics (2013). Lund Research Ltd.

Laux, D., Luse, A., & Mennecke, B. E. (2016). Collaboration, connectedness, and community: An examination of the factors influencing student persistence in virtual communities. *Computers in Human Behavior, 57*, 452-464. https://doi.org/10.1016/j.chb.2015.12.046

Lenning, O., Beal, P. E., & Sauer, K. (1980). *Retention and attrition: Evidence for action and research.* National Center for Higher Education Management, Contract 400-77-0004, 1980. ERIC. https://eric.ed.gov/?id=ED192661

Li, Z., & Rubie-Davies, C. M. (2018). Teacher expectations in a university setting: the perspectives of teachers. *Educational Research and Evaluation, 24*(3-5), 201-220, https://doi.org/10.1080/13803611.2018.1550835

Licht, M. H. (1995). Multiple regression and correlation. In L. G. Grimm & P. R. Yarnold (Eds.), *Reading and understanding multivariate statistics* (pp. 19-64). American Psychological Association.

Liftig, R. A. (2021). Using memoir in social studies and history classes: A VARK approach to address all learning styles. *Social Studies Research and Practice, 16*(1), 16-27. https://doi.org/ 10.1108/SSRP-03-2021-0007

Lindqvist, A., Gustafsson Sendén, M., & Renström, E. A. (2021). What is gender, anyway: A review of the options for operationalising gender. *Psychology & Sexuality, 12*(4), 332-344, https://doi.org/10.1080/19419899.2020.1729844

Loes, C. N., An, B. P., Saichaie, K., & Pascarella, E. T. (2017). Does collaborative learning influence persistence to the second year of college? *The Journal of Higher Education 88*(1), 62-84. https://doi.org/10.1080/00221546.2016.1243942

Long, J. S. (1997). *Regression models for categorical and limited dependent variables*: *Advanced quantitative techniques in the social sciences series* (Vol. 7). Sage Publications

Lucas, C. J. (2006). *American higher education: A history* (2nd ed.). Palgrave Macmillan

Mabel, Z., & Britton, T. (2018). Leaving late: Understanding the extent and predictors of college late departure. *Social Science Research, 69*, 34–51. https://doi.org/10.1016/j.ssresearch.2017.10.001

Mallette, B. I., & Cabrera, A. F. (1991). Determinants of withdrawal behavior: An exploratory study. *Research in Higher Education, 32*(2), 179–194. https://doi.org/10.1007/BF00974436

Mannan, M. A. (2001). An assessment of the academic and social integration as perceived by the students in the University of Papua New Guinea. *Higher Education, 41*(3), 283-298. https://doi.org/10.1023/A:1004186830125

Marcus, J. (2022, March 6). *Colleges' new solution to enrollment declines: Reducing the number of dropouts.* NBC News. https://www.nbcnews.com/news/education/colleges-new-solution-enrollment-declines-reducing-number-dropouts-rcna18569

Marsh, L. M. (1966). College dropouts – a review. *Personnel and Guidance Journal 44*(5), 475-481. https://doi.org/10.1002/j.2164-4918.1966.tb03549.x

McDaniel, A., & Van Jura, M. (2020). High-impact practices: Evaluating their effect on college completion. *Journal of College Student Retention : Research, Theory & Practice, 24*(3), 740-757. https://doi.org/10.1177/1521025120947357

McLeod, S. H. (1995). Pygmalion or golem? Teacher affect and efficacy. *College Composition and Communication, 46*(3), 369–386. https://doi.org/10.2307/358711

Mertler, C. A., & Vannatta, R. A. (2005). *Advanced and multivariate statistical methods: Practical application and interpretation* (3rd ed.). Pyrczak.

Meyers, L. S., Gamst, G., & Guarino, A. J. (2006). *Applied multivariate research: Design and interpretation.* Sage Publication.

Miller, D., Deshler, J., McEldowney, T., Stewart, J., Fuller, E., Pascal, M., & Michaluk, L. (2021). Supporting student success and persistence in STEM with active learning approaches in emerging scholars classrooms. *Frontiers in Education*, *6.* https://doi.org/10.3389/feduc.2021.667918

Mullen, C., & Mariam, Y. (2019). Adult learning: Barriers and enablers to advancement in Canadian power engineering. *Australian Journal of Adult Learning, 59*(2), 197-222.

Myers, C. B., Myers, S. M., & Peters, M. (2019). The longitudinal connections between undergraduate high impact curriculum practices and civic engagement in adulthood. *Research in Higher Education 60*, 83-110. https://doi.org/10.1007/s11162-018-9504-4

Nancekivell, S. E., Shah, P., & Gelman, S. A. (2020). Maybe they're born with it, or maybe it's experience: Toward a deeper understanding of the learning style myth. *Journal of Educational Psychology, 112*(2), 221-235. https://doi.org/10.1037/edu0000366

National Center for Education Statistics. (2021). *Graduation rate from first institution attended for first-time, full-time bachelor's degree-seeking students at 4-year postsecondary institutions, by race/ethnicity, time to completion, sex, control of institution, and percentage of applications accepted: Selected cohort entry years, 1996 through 2014.* Integrated Postsecondary Education Data System (IPEDS). https://nces.ed.gov/programs/digest/d21/tables/dt21_326.10.asp

National Center for Education Statistics. (2022a). Undergraduate Retention and Graduation Rates. *Condition of Education*. U.S. Department of Education, Institute of Education Sciences. https://nces.ed.gov/programs/coe/indicator/ctr.

National Center for Education Statistics. (2022b). Undergraduate Enrollment. *Condition of Education.* U.S. Department of Education, Institute of Education Sciences. https://nces.ed.gov/programs/coe/indicator/cha.

National Center for Health Statistics. (2017). *Health, United States, 2016: With chartbook on long-term trends on health* (DHHS Publication No. 2017-1232). U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. https://www.cdc.gov/nchs/data/hus/hus16.pdf

National Education Association. (2022). *The higher ed funding rollercoaster: State funding of higher education during financial crises* (Higher Ed State Funding Report). National Education Association. https://www.nea.org/he_funding_report

National Leadership Council, Liberal Education & America's Promise [NLC-LEAP]. (2007). *College learning for the new global century* (ED495004). ERIC

National Student Clearinghouse Research Center. (2023). *Completing college: National and state reports*. https://nscresearchcenter.org/wp-content/uploads/Completions_Report_2023.pdf

National Survey of Student Engagement [NSSE]. (n.d.). *Origins and potential of the National Survey of Student Engagement*. https://nsse.indiana.edu/nsse/about-nsse/general-nsse-info-facts/origins.html

Nilson, L. (2016). *Teaching at its best: A research-based resource for college instructors* (4th ed.). Jossey-Bass.

Nora, A. (1987). Determinants of retention among chicano college students: A structural model. *Research in Higher Education, 26*(1), 31-59. https://doi.org/10.1007/BF00991932

Nora, A., Cabrera, A., Hagedom, L. S., & Pascarella, E. (1996). Differential impacts of academic and social experiences on college-related behavioral outcomes across different ethnic and gender groups at four-year institutions. *Research in Higher Education, 37*(4), 427–451. https://doi.org/10.1007/BF01730109

Olson, J. K. (2006). The myth of catering to learning styles. *Science and Children, 44*(2), 56-57.

Orhan, A. (2022). Critical thinking dispositions and decision making as predictors of high school students' perceived problem solving skills. *The Journal of Educational Research (Washington, D.C.), 115*(4), 235-245. https://doi.org/10.1080/00220671.2022.2113498

Ostrow, M. J., Jimenez, M., Haley, J. D., & Campbell, C. M. (2021). The connection between faculty practices in class and students' time use out of class. *Innovative Higher Education, 46*(1), 59-76. https://doi.org/10.1007/s10755-020-09526-6

Pace, C. R. (1979). *College student experiences questionnaire*. Indiana University Bloomington. https://cseq.indiana.edu/cseq_generalinfo.cfm

Pace, C. R. (1982). *Achievement and the quality of student effort*. National Commission on Excellence in Education. ERIC. https://files.eric.ed.gov/fulltext/ED227101.pdf

Pace, C. R. (1984). *Measuring the quality of college student experiences.* Higher Education Research Institute. ERIC. https://files.eric.ed.gov/fulltext/ED255099.pdf

Pantages, T. J., & Creedon, C. F. (1978). Studies of college attrition: 1950-1975. *Review of Educational Research, 48*(1), 49-101. https://doi.org/10.2307/1169909

Pascarella, E. T. (1985). Racial differences in factors associated with bachelor's degree completion: A nine-year follow-up. *Research in Higher Education, 23*(4), 351-373. https://doi.org/10.1007/BF00973685

Pascarella, E. T., & Chapman, D. W. (1983). A Multiinstitutional, path analytic validation of Tinto's model of college withdrawal. *American Educational Research Journal, 20*(1), 87–102. https://doi.org/10.3102/00028312020001087

Pascarella, E. T., Duby, P. B., & Iverson, B. K. (1983). A text and reconceptualization of a theoretical model of college withdrawal in a commuter institution setting. *Sociology of Education, 56*(2), 88–100. https://doi.org/10.2307/2112657

Pascarella, E. T., & Terenzini, P. T. (1979). Interaction effects in Spady and Tinto's conceptual models of college attrition. *Sociology of Education, 52*(4), 197–210. https://doi.org/10.2307/2112401

Pascarella, E. T., & Terenzini, P. T. (1980). Predicting freshman persistence and voluntary dropout decisions from a theoretical model. *The Journal of Higher Education 51*(1), 60-75. https://doi.org/10.2307/1981125

Pascarella, E. T., & Terenzini, P. T. (1983). Predicting voluntary freshman year persistence/withdrawal behavior in a residential university: A path analytic validation of Tinto's model. *Journal of Educational Psychology 75*(2), 215-226. https://doi.org/10.1037/0022-0663.75.2.215

Pascarella, E. T., & Terenzini, P. T. (2005). *How college affects students: A third decade of research* (2nd ed., Vol. 2). John Wiley & Sons.

Pashler, H., McDaniel, M., Rohrer, D., & Bjork, R. (2008). Learning styles: concepts and evidence. *Psychological Science in the Public Interest, 9*(3), 105–119. https://doi.org/10.1111/j.1539-6053.2009.01038.x

Peduzzi, P., Concato, J., Kemper, E., Holford, T. R., & Feinstein, A. R. (1996). A simulation study of the number of events per variable in logistic regression analysis. *Journal of*

Clinical Epidemiology, 49(12), 1373-1379. https://doi.org/10.1016/S0895-4356(96)00236-3

Peltier, G. L., Laden, R., & Matranga, M. (1999). Student persistence in college: A review of research. *Journal of College Student Retention : Research, Theory & Practice, 1*(4), 357-375. https://doi.org/10.2190/L4F7-4EF5-G2F1-Y8R3

Perry, S. R., Cabrera, A. F., & Vogt, W. P. (1999). Career maturity and college student persistence. *Journal of College Student Retention : Research, Theory & Practice, 1*(1), 41-58. https://doi.org/10.2190/13EA-M98P-RCJX-EX8X

PrepScholar. (n.d.). Tarleton State University SAT Scores and GPA. https://www.prepscholar.com/sat/s/colleges/Tarleton-State-University-sat-scores-GPA#:~:text=The%20average%20GPA%20at%20Tarleton,some%20report%20an%20unweighted%20GPA.

Provencher, A., & Kassel, R. (2019). High-impact practices and sophomore retention: Examining the effects of selection bias *Journal of College Student Retention : Research, Theory & Practice, 21*(2), 221-241. https://doi.org/10.1177/1521025117697728

Raisman, N. (2013). *The cost of college attrition at four-year colleges & universities*. ERIC. https://files.eric.ed.gov/fulltext/ED562625.pdf

Reason, R. D. (2003). Student variables that predict retention: Recent research and new developments. *Journal of Student Affairs Research and Practice, 46*(3), 482-501. https://doi.org/10.2202/1949-6605.5022

Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity, 62 F.R. 58782 (published Oct. 30, 1997).

https://www.federalregister.gov/documents/1997/10/30/97-28653/revisions-to-the-standards-for-the-classification-of-federal-data-on-race-and-ethnicity

Rosenthal, R., & Jacobson, L. F. (1968). Teacher expectations for the disadvantaged. *Scientific American, 218*(4), 19-23. https://doi.org/10.1038/scientificamerican0468-19

Schneider, M., & Yin, L. (2011). *The hidden costs of community colleges.* American Institutes for Research. https://www.air.org/sites/default/files/2021-06/AIR_Hidden_Costs_of_Community_Colleges_Oct2011_0.pdf

Schreiner, L. A., & Nelson, D. D. (2013). The contribution of student satisfaction to persistence. *Journal of College Student Retention : Research, Theory & Practice, 15*(1), 73-111. https://doi.org/10.2190/CS.15.1.f

Scott, R. A., & Tobe, D. E. (1995). Communicating high expectations: Effective undergraduate education. *Liberal Education, 81*(2), 38–43.

Sexton, V. S. (1965). Factors contributing to attrition in college populations: Twenty-five years of research. *The Journal of General Psychology, 72*(2), 301-326. https://doi.org/10.1080/00221309.1965.9710701

Shedd, J. M. (2003). The history of the student credit hour. *New Directions for Higher Education, 2003*(122), 5-12. https://doi.org/10.1002/he.106

Shi, Q., Cresiski, R., Thanki, S., & Navarrete, L. (2023). Unlocking undergraduate student success: A study of high-impact practices in a comprehensive and diverse college. *Journal of Postsecondary Student Success, 2*(4), 83–107. https://doi.org/10.33009/fsop_jpss131207

Skoglund, K., Wall, T. J., & Kiene, D. (2018). Impact of supplemental instruction participation on college freshman retention. *The Learning Assistance Review, 23*(1), 115.

Slavin, R. E. (2016). Educational psychology: Theory & practice (Custom edition for Liberty University, EDUC 500 ed.). Pearson.

Spady, W. (1970). Dropouts from higher education: An interdisciplinary review and synthesis. *Interchange (Toronto. 1984), 1*(1) 64-85. https://doi.org/10.1007/BF02214313

Spady, W. (1971). Dropouts from higher education: Toward an empirical model. *Interchange (Toronto. 1984), 2*(3), 38-62. https://doi.org/10.1007/BF02282469

Stage, F. K. (1989). Reciprocal effects between the academic and social integration of college students. *Research in Higher Education, 30*(5), 517–530. https://doi.org/10.1007/BF00992201

Stoecker, J., Pascarella, E. T., & Wolfle, L. M. (1988). Persistence in higher education: A 9-year test of a theoretical model. *Journal of College Student Development 29*(3), 196-209.

Summerskill, J. (1962). Dropouts from college. In N. Sanford & J. Adelson (Eds.), *The American college: A psychological and social interpretation of the higher learning* (pp. 627-657). Wiley.

Swigart, T. E., & Murrell, P. H. (2001). Factors influencing estimates in gains made among African-American and Caucasian community college students. *Community College Journal of Research & Practice 25*(4), 297-312. https://www.doi.org/10.1080/106689201750122406

Szumski, G., & Karwowski, M. (2019). Exploring the Pygmalion effect: The role of teacher expectations, academic self-concept, and class context in students' math achievement. *Contemporary Educational Psychology, 59*(2019), https://doi.org/10.1016/j.cedpsych.2019.101787.

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

Tarleton State University (2023). *Tarleton makes top 50 for social mobility in national rankings*. Tarleton News. https://www.tarleton.edu/news/tarleton-makes-top-50-for-social-mobility-in-national-rankings/#:~:text=Eighty%2Dfive%20percent%20of%20all,percent%20are%20Pell%20Grant%20eligible.

Terenzini, P., Lorang, W., & Pascarella, E. T. (1981). Predicting freshman persistence and voluntary dropout decisions: A replication. *Research in Higher Education 15*(2), 109-127. https://doi.org/10.1007/BF00979592

Terenzini, P. T., & Pascarella, E. T. (1977). Voluntary freshman attrition and patterns of social and academic integration in a university: A test of a conceptual model. *Research in Higher Education 6*(1), 25-43. https://doi.org/10.1007/BF00992014

Terenzini, P. T., & Pascarella, E. T. (1978). The relation of students' precollege characteristics and freshman year experience to voluntary attrition. *Research in Higher Education 9*(4), 347-366. https://doi.org/10.1007/BF00991406

Terenzini, P. T., & Pascarella, E. T. (1980). Toward the validation of tinto's model of college student attrition: A review of recent studies. *Research in Higher Education, 12*(3), 271-282. https://doi.org/10.1007/BF00976097

Terenzini, P. T., & Wright, T. M. (1987a). Influences on students' academic growth during four years of college. *Research in Higher Education, 26*(2), 161–179. https://doi.org/10.1007/BF00992027

Terenzini, P. T., & Wright, T. M. (1987b). Students' personal growth during the first two years of college. *Review of Higher Education, 10*(3), 259-271. https://doi.org/10.1353/rhe.1987.0022

Thacker Thomas, D., Walsh, E. T., Torr, B. M., Alvarez, A. S., & Malagon, M. S. (2021). Incorporating high-impact practices for retention: A learning community model for transfer students. *Journal of College Student Retention : Research, Theory & Practice, 23*(2), 243-263. https://doi.org/10.1177/1521025118813618

Thibodeaux, J., Deutsch, A., Kitsantas, A., & Winsler, A. (2017). First-year college students' time use: Relations with self-regulation and GPA. *Journal of Advanced Academics, 28*(1), 5–27. https://doi.org/10.1177/1932202X16676860

Timmermans, A. C., Rubie-Davies, C. M., & Rjosk, C. (2018). Pygmalion's 50th anniversary: The state of the art in teacher expectation research. *Educational Research and Evaluation, 24*(3-5), 91-98. https://doi.org/10.1080/13803611.2018.1548785

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. (1982a). Defining dropout: A matter of perspective. In E. T. Pascarella (Ed.), *New Directions for Institutional Research: Studying Student Attrition* (No. 36, pp. 3-15). Jossey-Bass.

Tinto, V. (1982b). Limits of theory and practice in student attrition. *The Journal of Higher Education, 53*(6), 687-700. https://doi.org/10.2307/1981525

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

Tinto, V. (1997). Classrooms as communities: Exploring the educational character of student persistence. *The Journal of Higher Education (Columbus), 68*(6), 599. https://doi.org/10.2307/2959965

Tinto, V. (2000). Linking learning and leaving: Exploring the role of the college classroom in student departure. In J. M. Braxton (Ed.), *Reworking the student departure puzzle* (pp. 81-94). Vanderbilt University Press.

Tinto, V. (2006). Research and practice of student retention: What next? *Journal of College Student Retention : Research, Theory & Practice, 8*(1), 1-19. https://doi.org/10.2190/4YNU-4TMB-22DJ-AN4W

Tinto, V. (2012). Enhancing student success: Taking the classroom success seriously. *The International Journal of the First Year in Higher Education, 3*(1), 1-n/a. https://doi.org/10.5204/intjfyhe.v3i1.119

Tinto, V. (2017). Through the eyes of students. *Journal of College Student Retention 19*(3), 254-269. https://doi.org/10.1177/1521025115621917

Tinto, V., & Cullen, J. (1973). *Dropout in higher education: A review and theoretical synthesis of recent research*. Office of Planning, Budgeting, and Evaluation, Department of Health, Education, and Welfare, Contract OEC-0-73-1409, 1973. ERIC. https://eric.ed.gov/?id=ED078802

Tross, S. A., Harper, J. P., Osher, L. W., & Kneidinger, L. M. (2000). Not just the usual cast of characteristics: Using personality to predict college performance and retention. *Journal of College Student Development, 41*(3), 323.

Tsiplakides, I., & Keramida, A. (2010). *The relationship between teacher expectations and student achievement in the teaching of English as a foreign language* (EJ1081569). ERIC. https://files.eric.ed.gov/fulltext/EJ1081569.pdf

Tutal, Ö., & Yazar, T. (2022). Active learning promotes more positive attitudes towards the course: A meta-analysis. *Review of Education (Oxford), 10*(1), n/a. https://doi.org/10.1002/rev3.3346

Vesikivi, P., Lakkala, M., Holvikivi, J., & Muukkonen, H. (2020). The impact of project-based learning curriculum on first-year retention, study experiences, and knowledge work competence. *Research Papers in Education, 35*(1), 64-81. https://doi.org/10.1080/02671522.2019.1677755

Warner, R. M. (2013). *Applied statistics: From bivariate through multivariate technique*. Sage.

Weidman, J. C., & White, R. N. (1985). Postsecondary "high-tech" training for women on welfare: Correlates of program completion. *The Journal of Higher Education, 56*(5), 555–568. https://doi.org/10.1080/00221546.1985.11778718

WGU Labs (2021, June 10). *A conversation with Vincent Tinto about community based methods for student retention*. [Video]. YouTube. https://www.youtube.com/watch?v=fbAJClSoTfA

Wilton, M., Gonzalez-Niño, E., McPartlan, P., Terner, Z., Christoffersen, R. E., & Rothman, J. H. (2019). Improving academic performance, belonging, and retention through increasing structure of an introductory biology course. *CBE Life Sciences Education, 18*(4), ar53-ar53. https://doi.org/10.1187/cbe.18-08-0155

Winstone, N. E., Nash, R. A., Parker, M., & Rowntree, J. (2017). Supporting learners' agentic engagement with feedback: A systematic review and a taxonomy of recipience processes. *Educational Psychologist, 52*(1), 17-37. https://doi.org/10.1080/00461520.2016.1207538

Wolf-Wendel, L., Ward, K., & Kinzie, J. (2009). A tangled web of terms: The overlap and unique contribution of involvement, engagement, and integration to understanding

college student success. *Journal of College Student Development, 50*(4), 407-428. https://doi.org/10.1353/csd.0.0077

Wolfe, B. A. (2018). Introductory geosciences at the two-year college: Factors that influence student transfer intent with geoscience degree aspirations. *Journal of Geoscience Education, 66*(1), 36-54. https://doi.org/10.1080/10899995.2018.1411740

Xu, Y. J., & Webber, K. L. (2018). College student retention on a racially diverse campus: A theoretically guided reality check. *Journal of College Student Retention 20*(1), 2-28. https://doi.org/10.1177/1521025116643325

Zhao, C. & Kuh, G. D. (2004). Adding value: Learning communities and student engagement. *Research in Higher Education 45*(2), 115-138. https://doi.org/10.1023/B:RIHE.0000015692.88534.de

APPENDIX A

Scale I: Peer-Group Interactions

I have developed close personal relationships with other students

The student friends I have developed at this university have been personally satisfying

My interpersonal relationships with other students have had a positive influence on my personal growth, attitudes, and values

My interpersonal relationships with other students have had a positive influence on my intellectual growth and interest in ideas

It has been difficult for me to meet and make friends with other students

Few of the students I know would be willing to listen to me and help me if I had a personal problem

Most students at this university have values and attitudes different from my own

Scale II: Interactions with Faculty

My nonclassroom interactions with faculty have influenced my personal growth, values, and attitudes

My nonclassroom interactions with faculty have positively influenced my intellectual growth and interest in ideas

My nonclassroom interactions with faculty have positively influenced my career goals and aspirations

Since coming to this university I have developed a close, personal relationship with at least one faculty member

I am satisfied with the opportunities to meet and interact informally with faculty members

Scale III: Faculty Concern for Student Development and Teaching

Few of the faculty members I have had contact with are generally interested in students

Few of the faculty members I have had contact with are generally outstanding or superior teachers

Few of the faculty members I have had contact with are willing to spend time outside of class to discuss issues of interest and importance to students

Most of the faculty I have had contact with are interested in helping students grow in more than just academic areas

Most faculty member I have had contact with are genuinely interested in teaching

Scale IV: Academic and Intellectual Development

I am satisfied with the extent of my intellectual development since enrolling in this university

My academic experience has had a positive influence on my intellectual growth and interest in ideas

I am satisfied with my academic experience at this university

Few of my courses this year have been intellectually stimulating

My interest in ideas and intellectual matters has increased since coming to this university

I am more likely to attend a cultural event (for example, a concert, lecture, or art show) now than I was before coming to this university

I have performed academically as well as I anticipated I would

Scale V: Institutional and Goal Commitment

It is important for me to graduate from college

I am confident that I made the right decision in choosing to attend this university

It is likely that I will register at this university next fall

It is not important to me to graduate from this university

I have no idea what I want to major in

Getting good grades is not important to me

APPENDIX B

From: Sanfilippo, Tony
To: O'Dell, Dr. Amy
Subject: Re: [EXTERNAL] Re: Permission request
Date: Wednesday, June 22, 2022 9:51:16 AM
Attachments: image001.png
image002.png

Yes, it does.
All the best,
Tony Sanfilippo, Director
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From: "O'Dell, Dr. Amy" <ODELL@tarleton.edu>
Date: Saturday, June 18, 2022 at 6:45 PM
To: Tony Sanfilippo <sanfilippo.16@osu.edu>
Subject: RE: [EXTERNAL] Re: Permission request

Tony,
Thank you, I just want to clarify that the permission you provided below includes the right to use the material from pages 66-67 for my dissertation research and reprint the material in my finished dissertation.

Thank you,
Amy

Amy L. O'Dell, J.D.
Department Head, Government, Legal Studies, & Philosophy
Assistant Professor of Legal Studies
(254) 968-9027
O.A. Grant 341

From: Sanfilippo, Tony <sanfilippo.16@osu.edu>
Sent: Monday, June 13, 2022 9:17 AM
To: O'Dell, Dr. Amy <ODELL@tarleton.edu>
Subject: Re: [EXTERNAL] Re: Permission request

With this email I give Dr. Amy O'Dell permission to use material from pages 66-67, from the article titled, Predicting Freshman Persistence and Voluntary Dropout Decisions from a Theoretical Model published in *The Journal of Higher Education*, 51.1, in her dissertation. This permission covers non-exclusive, worldwide, English language rights. The reused material will include a copyright notice in the dissertation crediting the Ohio State University. No other rights are conferred with this permission.

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From: "O'Dell, Dr. Amy" <ODELL@tarleton.edu>
Date: Monday, June 6, 2022 at 11:35 AM
To: Tony Sanfilippo <tony@osupress.org>
Subject: RE: [EXTERNAL] Re: Permission request

Tony,
Thank you, I apologize for any confusion. I wasn't sure how to answer some of the questions. To clarify, I need the right to use the Institutional Integration Scale (in English), the questions for which are found in Table 1, for my dissertation study. I am also requesting the right to then include a copy of the IIS in the appendix of my dissertation. I am not requesting exclusive rights and I do not intend to translate the scale into any other language.

I hope that helps, thank you,
Amy O'Dell

APPENDIX C

From: Sanfilippo, Tony
To: O'Dell, Dr. Amy
Subject: [EXTERNAL] Re: Request for permission
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Thank you,
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APPENDIX D

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Number of figures/tables/illustrations	1

APPENDIX E

LIBERTY UNIVERSITY.
INSTITUTIONAL REVIEW BOARD

August 14, 2023

Amy O'Dell
David Gorman

Re: IRB Exemption - IRB-FY22-23-1414 The relationship between high-impact educational practices (HIPs) and institutional integration and persistence: A causal-comparative design

Dear Amy O'Dell, David Gorman,

The Liberty University Institutional Review Board (IRB) has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study to be exempt from further IRB review. This means you may begin your research with the data safeguarding methods mentioned in your approved application, and no further IRB oversight is required.

Your study falls under the following exemption category, which identifies specific situations in which human participants research is exempt from the policy set forth in 45 CFR 46:104(d):

Category 2.(ii). Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met:
Any disclosure of the human subjects' responses outside the research would not reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, educational advancement, or reputation; or

For a PDF of your exemption letter, click on your study number in the My Studies card on your Cayuse dashboard. Next, click the Submissions bar beside the Study Details bar on the Study details page. Finally, click Initial under Submission Type and choose the Letters tab toward the bottom of the Submission Details page. Your information sheet and final versions of your study documents can also be found on the same page under the Attachments tab.

Please note that this exemption only applies to your current research application, and any modifications to your protocol must be reported to the Liberty University IRB for verification of continued exemption status. You may report these changes by completing a modification submission through your Cayuse IRB account.

If you have any questions about this exemption or need assistance in determining whether possible modifications to your protocol would change your exemption status, please email us at irb@liberty.edu.

Sincerely,
G. Michele Baker, PhD, CIP
Administrative Chair
Research Ethics Office

APPENDIX F

Institutional Review Board (IRB)
irb@tarleton.edu
Box# T – 0460
(254) 968-1815

TARLETON STATE UNIVERSITY

Exemption Memo

Date:

To:

From: Tarleton State University IRB

Title of Project:

Your application has been determined *Exempt* under rule 45 CFR 46

IRB Number:

IRB Approval Expires:

Continuing Review Due Before:

Conditions of Approval:

Should you make changes to your originally proposed/approved research, an amendment application will need to be submitted to our office for approval. This amendment MUST be approved prior to the changes being implemented.

If you wish to continue your research beyond the date of expiration, please submit a request for continuing review 45 days prior to the expiration date.

Thank you for submitting your application and we wish you success in your research.

Tarleton IRB

APPENDIX G

Hello Government Students,

As a graduate student in the School of Education at Liberty University, I am conducting research as part of the requirements for a Ph.D. degree. The purpose of my research is to learn more about how Tarleton government classes impact students and whether it is possible to predict a student's desire to remain at Tarleton based on the government class in which the student was enrolled. If you meet my participant criteria and are interested, I would like to invite you to join my study.

Participants must be 18 years of age or older and be enrolled in a face-to-face section of either Texas Government or Federal Government during the fall 2023 semester. Participants, if willing, will be asked to complete a survey twice during the semester, once around weeks 2 or 3 and a second time around week 12. It should take approximately 10-15 minutes each time to complete the procedures listed. Names and other identifying information will be requested as part of this study, but the information will remain confidential.

Would you like to participate? [Yes] Great, please scan the QR code on the screen. [No] I understand. Thank you for your time.

A consent document is provided as a hyperlink within the first question of the survey. The consent document contains additional information about my research. After you have read the consent form, please type your name and date in the space provided. Doing so will indicate that you have read the consent information and would like to take part in the study. Then advance to the next question until you complete the survey

Thank you for your time. Do you have any questions?