Instructional and Student Services Costs in Private Postsecondary Education and Retention Rates in Texas

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Abstract

The purpose of this quantitative correlational-predictive study was to determine to what extent, if any, instructional costs and student services costs together and separately predict retention rates in the state of Texas in private postsecondary institutions. The decisions on where post-secondary institutions allocate their funds, has become an imperative. Based on Tinto's theory of institutional departure, the predictor variables were instructional costs and student services costs, and the criterion variable was retention rates of postsecondary private institutions in Texas. Ninety-nine Post-secondary institutions were used for this study. The data used for the study were secondary data obtained from IPEDS (Integrated Postsecondary Data Systems). The results of the multiple linear regression indicated that there was a collective significant effect of instructional costs on retention rates $F(1,58) = 4.754$, $p<.05$, Adjusted $R^2 = .060$). If the instruction cost increases by 1 unit, the average retention rate increased by 6.61 units. This indicates that there is a positive relationship between instructional costs and retention rates. The results of student services costs only showed $p = 0.33$, which is more than the expected 0.05 level of significance.

Keywords: Retention, Costs, Instructional, Student Services, Postsecondary, Texas, Private, Tinto, IPEDS

Introduction

The purpose of this quantitative correlational-predictive study was to determine to what extent, if any, instructional costs and student services costs predict retention rates in the state of Texas in private postsecondary institutions. Retention rates in private postsecondary institutions have been deemed unacceptably low relative to rates in public postsecondary institutions (Seidman, 2018). According to the Integrated Postsecondary Educational Data System (IPEDS) website, in 2018, overall public institutions had a reported retention rate of 81.2% while private institutions had a reported retention rate of 59.8% (IPEDS, 2019). In 2019, Texas public institutions retained students at a rate of 77% while private institutions retained students at a rate of 71% (IPEDS, 2019). Low retention rates are often correlated with poor completion rates. Low rates of completion result in decreased revenue for the institution, scheduling challenges, and teacher workload changes (Seidman, 2018). Furthermore, decreased revenue often results in budget shortfalls (Barr & McClellan, 2018). This concern over revenue has led institutions with operational challenges to explore ways to help improve retention rates.

The causes of poor retention rates have been studied extensively. Studies on academic success, integration of transitions, transfers, and prediction models have attempted to analyze causes and solutions for low retention rates (Aulck & West, 2017; Musamali, 2019; Raju & Schumacker, 2015; Saunders-Scott et al., 2018). Retention rates are dependent on many variables, to include college preparation, financial aid, and personal factors. According to Bowman et al. (2019), "higher education studies often focus on many of the same types of predictors, which include student demographics, precollege academic achievement, institutional characteristics, and college experiences" (pp. 135–136). However, scholars have not proposed solutions to these challenges (Aulck & West, 2017; Seidman, 2018).

Instructional costs and student services costs have become the main categories related to costs for higher learning institutions (Gansemer-Topf et al., 2018; Lopez, 2018). Instructional costs are those that are linked directly to academic instruction, while student services costs are those related to other auxiliary academic services provided by colleges. According to the IPEDS (2019), instructional costs are expenses of the colleges, schools, universities, departments, including other instructional divisions of the institution. Instructional costs also include expenses for departmental research and public service that are not independently budgeted (IPEDS, 2019).

Student services costs are expenses specifically for admissions, registrar, and other activities (IPEDS, 2019). As Gansemer-Topf et al. (2018) and Dominguez-Whitehead (2017) defined, student services costs are aimed at positively contributing to the students' emotional, academic, physical, cultural, and social health and well-being. Although student services are those that are not directly used for academic purposes, student services costs help provide services that both affirm and support academic work (Dominguez-Whitehead, 2017). These student services contribute directly to the student experience and provide guidance and direction for overall student engagement, often manifesting in academic success (Dominguez-Whitehead, 2017).

Few studies, however, have addressed to what extent retention rates are predicted by expenditures for instruction and student services (Gansemer-Topf et al., 2018). Dahlvig et al. (2020) and Millea et al.

(2018) argued that there is a link between funds spent on instruction and research and retention rates in universities. Specifically, Millea et al. (2018) stated, "instructional costs, including other costs related to support services, are associated with retention rates" (p. 309). Dahlvig et al. (2020) also noted that financial costs such as those related to student support services are associated with retention rates and graduation rates. Previous researchers did not specifically focus on instructional costs and student services costs, and their association to retention rates in private postsecondary institutions (Dahlvig et al., 2020; Millea et al., 2018). This is vital to address, given that understanding the relationship among instructional costs, student services costs, and retention rates could lead to effective development of strategies that could be implemented in private postsecondary institutions in order to increase retention and revenue (Dahlvig et al., 2020; Millea et al., 2018).

The current study extended prior research by Dahlvig et al. (2020) and Millea et al. (2018) on the recognition that there is a positive correlation between dollars spent for instruction and research and higher retention rates in universities. Millea et al. (2018) found in their study that academic success and expenditures for instruction contribute to higher retention rates for students. Dahlvig et al. (2020) stated further, "it is imperative that colleges and universities examine how they allocate finite dollars in ways that increase retention and graduation rates" (p. 1). This statement implies the examination of how colleges and universities allocate their finite resources in terms of instructional services and student services costs, as these are both associated with retention rates (Dahlvig et al., 2020; Millea et al., 2018). Strategies for allocation of financial resources could increase retention and graduation rates (Dahlvig et al., 2020).

Background of the Study

Relative to public institutions, in general private institutions have lower retention rates. In Texas, public institutions retain students at a rate of 77%, while private institutions retain students at a rate of 71% (IPEDS, 2019). Retention rates are generally a concern for postsecondary education due to low completion rates and high dropout rates, which result in overall decreased revenue for institutions. Defined by the variance between first- and second-year college students and degree completion, low retention rates contribute to lost revenue with added expenses for prevention (Barclay et al., 2018; National Center for Education Statistics, 2016; National Student Clearinghouse Research Center, 2018).

In private postsecondary institutions, low retention rates result in decreased revenue, reduced services, and lack of infrastructure (Seidman, 2018). Texas institutions draw students largely from the state of Texas (Texas Higher Education Coordinating Board, 2019). The education system in Texas is a large publicly funded system from elementary to postsecondary. By targeting postsecondary private institutions in Texas, the findings of this study will enhance our understanding of student service costs and instructional costs, both in research and in practice, in private institutions in Texas. Discovering the relationship between retention rates and cost of services may assist private postsecondary institutions in designing effective strategies that could aid in increasing retention rates.

Problem Statement

It was not known to what extent, if any, instructional costs and student services costs predict retention rates in the state of Texas in private postsecondary institutions. Low completion rates in private postsecondary institutions continue to be a problem, as they significantly contribute to lost revenue for the institution, scheduling challenges, teacher workload change, and budget shortfalls (Barr & McClellan, 2018; Seidman, 2018). This was especially vital to address, given that retention rates have not improved in recent years (Seidman, 2018). With low retention rates, institutions bear significant losses in tuition and opportunity costs for instruction and services. Despite these, the predictive nature of the relationship between instructional and student services costs and retention rates has not been thoroughly explored.

Purpose Statement

The purpose of this quantitative correlational-predictive study was to determine to what extent, if any, instructional costs and student services costs together and separately predict retention rates in the state of Texas in private postsecondary institutions. The predictor variables were instructional costs and student services costs, and the criterion variable is retention rates of postsecondary private institutions in Texas. The data on retention rates and the costs for instructional services and student services come from archived, secondary data on the Integrated Postsecondary Data Systems website (IPEDS, 2019).

Research Questions and Hypotheses

Based on the problem and the theoretical foundation of the study, the following research question was developed:

RQ1: To what extent, if any, do instructional costs and student services costs together and separately predict retention rates in the state of Texas in private postsecondary institutions?

$H1_0$: Instructional costs and student services costs together do not statistically significantly predict retention rates in the state of Texas in private postsecondary institutions.

$H1_a$: Instructional costs and student services costs together statistically significantly predict retention rates in the state of Texas in private postsecondary institutions.

$H2_0$: Instructional costs do not statistically significantly predict retention rates in the state of Texas in private postsecondary institutions.

$H2_a$: Instructional costs statistically significantly predict retention rates in the state of Texas in private postsecondary institutions.

$H3_0$: Student services costs do not statistically significantly predict retention rates in the state of Texas in private postsecondary institutions.

$H3_a$: Student services costs statistically significantly predict retention rates in the state of Texas in private postsecondary institutions.

Advancing Theoretical Knowledge

Based on the identified research gap and a need for further research, this study addressed the predictive quality of instructional and student services costs on retention rates (Millea et al., 2018). Based on Tinto' original theory on student departure, this study has value for postsecondary leadership in making decisions to allocate resources for increased retention rates (Millea et al., 2018). Knowing the predictive quality of costs can help institutions in making appropriate financial and operational decisions in attempts to find ways to improve retention rates (Banks & Dohy, 2019). Parallel to Tinto's seminal work, instructional costs were an extension of academic success while student services costs were extended from student engagement. While Tinto took a qualitative view, this study took a quantitative approach to the variables.

Application to Business Administration

Administrators and supervisors in higher education remain mindful and concerned with retention rates of students. Aside from the obvious societal problem of students dropping out and incurring expense and debt without degree completion, retention of students provides needed resources for institutional operations. In developing budgets in higher education, officials work to project enrollment to help determine budget allocations, scheduling for classes, faculty teaching assignments, and student activities. These costs generally fall into two categories—instructional costs and student services costs. Business leaders in most industries work to forecast future growth or declines. This study focuses on the business side of higher education.

Definition of Terms

Instructional Costs: Instructional costs are costs that are linked directly to academic instruction. As defined by the IPEDS (2019), instructional costs refer to "a functional expense category that includes expenses of the colleges, schools, departments, and other instructional divisions of the institution and expenses for departmental research and public service that are not separately budgeted" (IPEDS, 2019, Glossary). Example outputs generated from instructional costs include "general academic instruction, occupational and vocational instruction, community education, preparatory and adult basic education, and regular, special, and extension sessions" (IPEDS, 2019, Glossary).

Student Services Costs: Student services costs are costs that are not directly connected to academic instruction. As defined by IPEDS (2019), student services costs belong toa functional expense category, including expenses for admissions, registrar activities, and activities. The primary purpose of student services costs is to positively contribute to students' emotional and physical well-being, as well as their intellectual, cultural, and social development outside the context of the formal instructional program (Dominguez-Whitehead, 2017; IPEDS, 2019). Examples of output from student services costs "include student activities, cultural events, student newspapers, intramural athletics, student organizations, supplemental instruction outside the normal administration, and student records" (IPEDS, 2019, Glossary). According to Dominguez-Whitehead (2017), such services contribute directly to the student experience and provide guidance and direction for overall student engagement.

Literature Review

Increasing the retention of students in higher education is a challenge for institutions and leadership (Lascher, 2018; Lenhardt, 2017; Rodriguez et al., 2019). The value of focused research on retention is to provide data and information that can help institutions make decisions that help students remain in school with the goal of completing a college degree. In this literature review, the researcher explores and analyzes the developments related to retention in postsecondary institutions. The gap is presented, followed by the foundational theory and the theoretical concepts.

Historically, research into retention has concentrated efforts in providing solutions to alleviate institutional departure or high retention rates while giving recommendations to institutions on how to create or support programs and initiatives to help students remain in school (Dos Santos, 2018; Little et al., 2018; Sadowski et al., 2017; Tinto, 1975). Solutions to increase retention rates include ways to help students succeed academically (Hepworth et al., 2018) while developing a sense of belonging through student services (Davis et al., 2019). These solutions point back to Tinto's theory of institutional departure, in which the recommendation for integration of academic success and student engagement became foundational in studies of retention in postsecondary institutions (Tinto, 1988). The degree of student engagement is often reflected in the retention rates of the colleges. Hence, the goal of the current researcher was to determine to what extent, if any, instructional costs and support services costs predict retention rates in private nonprofit colleges in Texas. Designs for postsecondary institutions are guided by accreditation standards, funding, facilities, personnel, inventory, and curriculum (Clapper, 2016). Additionally, the societal need for students to complete their education, with the goal of contributing to an educated workforce, is a responsibility for institutions of higher learning (Clapper, 2016).

The need for students to be academically successful contributes to higher retention rates and persistence toward completing a degree (Ingmire, 2019; Millea et al., 2018; Schneider & Clark, 2018). Related to academic success, the findings of the study of Saunders-Scott et al. (2018) demonstrated that a relationship of grit and stress contributed positively to academic success and increased retention rates more than standardized test scores.

Institutional Costs

Researchers have shown that overall resource allocation has a significant impact on retention rates. Authors such as Iwamasa and Thrasher (2019) and Hepworth et al. (2018) cited the need for more allocation of resources for academic preparation in higher education to improve retention rates. Through a quantitative research study on instructional costs, Iwamasa and Thrasher (2019) examined and analyzed data from the National Center for Education Statistics and the Federal Reserve Economic Data system over a 10-year period. Iwamasa and Thrasher found that increases in instructional costs are linked to retention outcomes. Costs in areas other than instruction contribute to higher retention rates of students, as also indicated by Webber and Ehrenberg (2009). The authors of this study conducted a study regarding instructional costs and its impact on retention or persistence rates. Using IPEDS data collected through the Delta Cost Project, the researchers compared costs in postsecondary institutions to retention rates and test scores and Pell Grant recipients. Their conclusion was that redirecting some costs to student services for students underprepared for college work contributes to improved retention

(persistence) rates (Webber & Ehrenberg, 2009). This important study was similar to the current study but focused primarily on test scores and students from a lower economic status (Webber & Ehrenberg, 2009). In addition, the study by Webber and Ehrenberg is now outdated with the current climate resulting in possibly reduced relevance for contemporary times. Regardless, it is a valuable study for the need to identify costs that possibly lead to improved retention rates for institutions. This body of findings supports the importance of costs in enhancing retention outcomes.

Methodology

The variables selected for the study were retention rates as the criterion variable and student services costs and instructional costs as the predictor variables. Data for the variables were derived from the IPEDS website. The target population included private postsecondary institutions. The sample population included all private postsecondary institutions in Texas who report data to IPEDS. Any and all institutions accepting federal funds through Title IV financial aid are required to report data to the IPEDS.

The population of interest involved private, postsecondary 4-year institutions in Texas. There are 99 private postsecondary institutions in Texas. In this study, the researcher focused on accredited institutions in the state of Texas that are considered nonprofit 4-year institutions and for-profit 4-year institutions. The focus on accredited institutions was due to the availability of archived data on the variables. The unit of analysis was the following: the factors of instructional costs and student services costs (i.e., the predictor variables) and retention rates (i.e., the dependent variable). This study used publicly available IPEDS data on the variables. These data were used to analyze a minimum of 68 selected private postsecondary education institutions.

Research Design

The research design chosen for this study was a correlational-predictive design as the study was aimed at determining if the independent variables predict the dependent variable (Johnson, 2001). The data were drawn from archives because of the existence of comprehensive information relevant to answer the research question that were available. The institutions and variables were selected from the IPEDS website to facilitate comparative statistics. The archived data were available for both the dependent and predictor variables.

The current correlational-predictive quantitative study did not require the manipulation of variables. The variables in this study were drawn from the synthesis of the problem statement and form gaps found in the literature. Lodico et al. (2006) recommended a quantitative methodology when the researcher analyzes numerical data to determine whether relationships exist between the variables. The method described by Lodico et al. (2006) using predictive, correlational, and regression analysis was deemed appropriate for this study. The data were compiled in Excel spreadsheets and then exported to SPSS. SPSS was used to conduct predictive statistical analysis and to generate graphs and charts for each research question. Regression analysis was used, and multiple datasets were combined into a single dataset for final analysis.

Population and Sample Selection

The general population for the research of this study included 99 private postsecondary institutions in the state of Texas. The samples for the study included private postsecondary institutions in Texas. Texas was selected due to the number of private institutions and the expectation that most students in Texas come from a similar educational system. The researcher gathered secondary IPEDS data that were previously cleaned and legally reported. Institutions that receive governmental aid in the form of Title IV funds are required to report their institutional data to include categories such as admission, test scores, tuition costs, numbers of staff, faculty, credentials, accreditation information, trustees, affiliations, retention, expenses, budgets, and endowments. The IPEDS data are gathered each year by institutions, and the data are part of the National Center for Education Statistics, an entity within the U.S. Department of Education and the Institute of Education Science (IPEDS, 2019). The NCES is mandated by Congress to collect, analyze, and report statistics on the condition of American education (IPEDS, 2019).

Data Analysis Procedures

Archived secondary non-dichotomous data from the IPEDS website on at least 68 private postsecondary institutions were included in the data analysis. Inferential and predictive statistics were performed using SPSS. Inferential statistics including regression analysis were used to analyze the predictive nature of the predictor variables (instructional costs and student services costs) on the criterion variable (retention rates). SPSS was also used to analyze measures of central tendencies of study variables (mean, median, mode).

Because each research hypothesis has one criterion variable and at least one predictor variable, the most appropriate statistical test relevant to the research question was regression analysis. The interval of the criterion variable is 0–100 (percentage) based on students returning to the same institution between first and second year (IPEDS, 2019). The data that were used in the linear regression analysis were tested for the following assumptions:

- The dependent variable is continuous.
- The observations are independent, meaning that each participant counts as one observation, as tested by the Durbin-Watson statistic.
- There is a linear relationship between the dependent variable and each independent variable, and the dependent variable and the independent variables together, as tested by a partial regression plot between each independent variable and the dependent variable.
- Homoscedasticity of residuals, as tested by plotting the standardized residuals against unstandardized residuals.
- No multicollinearity, determined by inspecting coefficients.
- No significant outliers as determined by casewise diagnostics
- The residuals are normally distributed, tested by normal P-P plot or Q-Q plot (generated as a part of the MR procedure).

To make valid inferences from the regression analysis, the residuals of the model should follow a normal distribution. The skewness for a normal distribution is zero, and any symmetric data should have a kurtosis near zero (Field, 2017). Skewness and kurtosis tests suggest that the predictor variables were not normally distributed (see Table 1). Therefore, there was a need to transform the data. As per the analysis conducted, log transformation was needed for the predictor variables. Table 2 presents the skewness and kurtosis of the transformed data for the predictor variables and are all within the acceptable range for data following normal distribution. The log-transformed data of the predictor variables were used in the regression analyses conducted. As such, the assumption of normality was met.

Table 1
Skewness and Kurtosis of Study Variables

Variable	Skewness	Kurtosis
Retention Rate	-.250	-.251
Instructional Costs	3.596	12.856
Student Services Costs	4.191	19.859

Table 2
Skewness and kurtosis of log-transformed predictor variables

Variable	Skewness	Kurtosis
Instructional Costs	-.282	.639
Student Services Costs	-.583	1.238

Descriptive Findings

The study included data on postsecondary private institutions in Texas regarding retention rates for the year 2019, the costs of student services for the academic year 2018–2019, and the instructional costs for the academic year 2018–2019. After removing institutions with missing values, a total of 60 valid observations listwise were obtained. Table 3 presents the descriptive statistics of the study variables. The predictor variable, instructional costs, had a mean of $30,112,201.43 with a standard deviation of $66,138,529.14. The predictor variable, student services, costs had a mean of $13,178,501.65 with a standard deviation of $27,450,811.64. The criterion variable retention rate had a mean 67.05% with a standard deviation of 18.41.

Table 3
Descriptive Statistics of Study Variables

Variable	Min	Max	*Mean*	*SD*
Retention Rate	19.00	100.00	67.05	18.41
Instructional Costs	$66,137.00	$333,206,848.00	$30,112,201.43	$66,138,529.14
Student Services Costs	$11,375.00	$169,832,000.00	$13,178,501.65	$27,450,811.64

Data Analysis Procedures

After pre-processing the raw data to a final data set, a total of 60 institutions were included for data analysis. These 60 institutions were below the minimum required sample size of 68. Based on the post hoc analysis conducted using G*Power, a sample size of 60 institutions had a power of 74.7% which is below the 80% power of test target.

Results

The main research question that was addressed for this study was "To what extent, if any, do instructional costs and student services costs together and separately predict retention rates in the state of Texas in private postsecondary institutions?" Multiple and simple linear regression analyses were conducted to test the three study hypotheses. The results for each hypothesis testing are shown in the follow subsections.

Hypothesis 1

Multiple linear regression analysis was conducted to test hypothesis 1. The predictor variables were the instructional costs and student services costs while the criterion variable was the retention rates. The results of the multiple linear regression analysis for the hypothesis 1 are shown in Tables 4 through 6.

The regression model that was developed has an R of .278, which indicates a low degree of correlation (see Table 4). The R^2 value indicates how much of the total variation in the criterion variable, retention rates, can be explained by the predictor variables, instructional costs and student services costs. In this case, only 7.7% of the criterion variable variation can be explained by the regression model that contains two predictor variables.

Table 5 shows how well the regression model predicts the criterion variable. The results showed that, overall, the regression model does not statistically significantly predict the criterion variable, $F(2,57) = 2.386$, $p=.101$. In other words, the regression model that was developed was not a good fit for the data.

Table 6 provides the necessary information to predict retention rates from instructional costs and student services costs, as well as determine whether these predictor variables contribute statistically significantly to the model. The results showed that both instructional costs, $t = 1.147$, $p=.256$ and student services costs, $t = -.304$, $p=.762$, were nonsignificant predictors of retention rates. Therefore, the results showed that there was not enough statistical evidence to reject the null hypothesis 1 and it can be concluded that instructional costs and student services costs together do not statistically significantly predict retention rates in the state of Texas in private postsecondary institutions.

Table 4
Model Summary for Hypothesis 1

Model	Value
R	.278
R Square	.077
Adjusted R Square	.045
Std. Error of the Estimate	17.990

Table 5
ANOVA Test for Hypothesis 1

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1,544.364	2	772.182	2.386	.101
Residual	18,446.486	57	323.623		
Total	19,990.850	59			

Table 6
Regression Coefficients for Hypothesis 1

Model	Unstandardized Coefficients		Standardized	t	Sig.
	B	Std. Error	Beta		
Constant	22.318	21.353		1.045	.300
Instructional Costs	8.735	7.615	.363	1.147	.256
Student Services Costs	-2.340	7.698	-.096	-.304	.762

Hypothesis 2

Simple linear regression analysis was conducted to test hypothesis 2. The predictor variable was the instructional costs while the criterion variable was the retention rates. The results of the simple linear regression analysis for the hypothesis 2 are shown in Tables 7 through 9.
The regression model that was developed has an R of .275, which indicates a low degree of correlation (see Table 7). The R^2 value indicates that only 7.6% of the criterion variable variation can be explained by the regression model that contains one predictor variable. On the other hand, Table 8 shows how well the regression model predicts the criterion variable and the results showed that, overall, the regression model statistically significantly predicts the criterion variable, $F(1,58) = 4.754$, $p<.05$. In other words, the regression model that was developed was a good fit for the data.

Table 9 provides the necessary information to predict retention rates from instructional costs, as well as determine whether this predictor variable contribute statistically significantly to the model. The results showed that instructional costs, $t = 2.189$, $p<.05$ was a significant predictor of retention rates. It can be inferred from the results the following regression equation: Retention Rates = 21.502 + 6.614 * (Instructional Costs). The regression coefficient represents the mean increase of retention rate for every additional one unit in instructional cost. If the instruction cost increases by 1 unit, the average retention rate increases by 6.61 units. This indicates that there is a positive relationship between instructional costs and retention rates. Therefore, the results showed that there was enough statistical evidence to

reject the null hypothesis 2 and it can be concluded that instructional costs statistically significantly predict retention rates in the state of Texas in private postsecondary institutions.

Table 7
Model Summary for Hypothesis 2

Model	Value
R	.275
R Square	.076
Adjusted R Square	.060
Std. Error of the Estimate	17.848

Table 8
ANOVA Test for Hypothesis 2

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1,514.455	1	1,514.455	4.754	.033
Residual	18,476.395	58	318.559		
Total	19,990.850	59			

Table 9
Regression Coefficients for Hypothesis 2

	Unstandardized Coefficients		Standardized		
Model	B	Std. Error	Beta	t	Sig.
Constant	21.502	21.017		1.023	.311
Instructional Costs	6.614	3.034	.275	2.180	.033

Hypothesis 3

Simple linear regression analysis was conducted to test hypothesis 3. The predictor variable was the student services costs while the criterion variable was the retention rates. The results of the simple linear regression analysis for the hypothesis 3 are shown in Tables 10 through 12.

The regression model that was developed has an R of .237, which indicates a low degree of correlation (see Table 10). The R^2 value indicates that only 5.6% of the criterion variable variation can be explained by the regression model that contains one predictor variable. On the other hand, Table 11 shows how well the regression model predicts the criterion variable and the results showed that, overall, the regression model does not statistically significantly predict the criterion variable, $F(1,58) = 3.438$, $p=.069$. In other words, the regression model that was developed was not a good fit for the data.

Table 12 provides the necessary information to predict retention rates from student services costs, as well as determine whether this predictor variable contribute statistically significantly to the model. The results showed that student services costs, $t = 1.854$, $p=.069$ was a non-significant predictor of retention rates. Therefore, the results showed that there was not enough statistical evidence to reject the null hypothesis 3 and it can be concluded that student services costs do not statistically significantly predict retention rates in the state of Texas in private postsecondary institutions.

Table 10

Model Summary for Hypothesis 3

Model	Value
R	.237
R Square	.056
Adjusted R Square	.040
Std. Error of the Estimate	18.038

Table 11

ANOVA Test for Hypothesis 3

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1,118.594	1	1,118.594	3.438	.069
Residual	18,872.256	58	325.384		
Total	19,990.850	59			

Table 12

Regression Coefficients for Hypothesis 3

Model	Unstandardized Coefficients		Standardized		
	B	Std. Error	Beta	t	Sig.
Constant	29.194	20.550		1.421	.161
Instructional Costs	5.747	3.099	.237	1.854	.069

To address the research question and test the hypotheses of the study, multiple linear regression analyses were performed. For each hypothesis, one regression model was formulated and tested for significance. In the first hypothesis, the overall model and the proportion of variance in retention rates that was explained by both instructional costs and costs of student services were assessed first. For the second and third hypotheses, a model for instructional costs and another one for costs of student services were formulated separately. In this section, the details of the findings are presented, including how they address the research question. Supporting studies from the literature reviewed in this research are also presented in relation to the results.

Overall Organization

The quantitative study has one main research question and three sets of alternate hypotheses. The results from the analysis of the data revealed that both instructional costs and costs of student services are significant factors for predicting retention rates. In terms of the research question, a general confirmation of the query has been found.

Hypothesis 1. In the first hypothesis, the relationship explored was that of instructional costs combined with student services costs in relation to retention rates in the state of Texas in private postsecondary institutions. Based on the result, there was not a collective significant effect of instructional costs and costs of student services on retention rates, resulting in accepting the null hypothesis due to being not statistically significant. This brings to question the retention rate theory previously identified of

integrating instruction and student services. Additionally, accepting the null hypothesis does not support the idea of allocating resources for both areas, instructional services and student services together. Taking this to another level, the lack of significance of this points to the idea that together instructional services and student services costs do not predict retention rates.

The literature reviewed for this study supports the premise that academic instruction has a significant influence on student retention. Wright-Kim et al. (2019) claimed that costs linked to instruction and institutional grants were positively correlated to student retention and graduation rates. In related studies on retention, scholars have highlighted the need for postsecondary institutions to provide services to students while controlling expenses and attracting much needed revenue (Horn et al., 2019; Pike et al., 2011). Based on these claims, it is suggested that to promote positive retention rates, institutions should consider spending on instruction for students while maintaining positive cashflow for the institution. This invariably supports the conclusions of Horn et al. (2019) and Pike et al. (2011).

For the second half of the results regarding the first hypothesis, the researcher concluded that student services costs in combination with instructional costs are not significantly related to retention rates. In the literature that was reviewed for this study, it was discovered that redirecting some costs to student services for students underprepared for college work contributed to improved retention (persistence) rates (Webber & Ehrenberg, 2009). Conclusions could be made that spending for services that are not related to academic instruction may improve retention of students, although the current research does not support this supposition. Webber and Ehrenberg's focus on underprepared students was not a consideration in the scope of this study.

Hypothesis 2. In the second hypothesis, the relationship explored was that of instructional costs and retention rates of students in the state of Texas in private postsecondary institutions. Based on this result, instructional costs as an individual independent predictor variable, had significant impact on retention rates, at $p = 0.33$, which is more than the expected 0.05 level of significance. The second null hypothesis was not rejected. In relation to the existing literature reviewed for this study, the result for the second hypothesis was intuitive to research about instructional expenditures of an educational institution, which was mostly found as a significant contributor to the increase in retention rates of students (Gansemer-Topf et al., 2018; Kim, 2018; Saunders-Scott et al., 2018). Researchers have generally recommended that in order to achieve high retention rates postsecondary institutions must allocate resources for academic instruction of students while controlling expenses and bringing in revenue (Braxton & Francis, 2018; Hornet al., 2019; Pike et al., 2011; Sadowski et al., 2017).

Much of the literature reviewed for this study presented claims that were consistent with the results of this study. For example, Iwamasa and Thrasher (2019) found that increases in instructional costs are linked to retention outcomes. Schneider and Clark (2018) also agreed with the findings of Iwamasa and Thrasher, citing that an increase in instructional costs increases retention rates. Schneider and Clark suggested reforms in the resource allocation and spending of institutions in order to improve retention rates. Included in the reforms is the allocation of resources for academic instruction in order to increase retention and graduation rates of students (Schneider & Clark, 2018). The common findings in existing literature conform to the results for the second hypothesis for this study.

Hypothesis 3. In the third hypothesis, the relationship explored was that of student services costs and retention rates of students in the state of Texas in private postsecondary institutions. Based on the result, student services costs as an individual independent predictor variable, had no significant impact on retention rates, at $p = 0.980$, which was greater than the expected 0.05 level of significance. Based on this statistical result, the third null hypothesis was not rejected.

The result for the third hypothesis was found to be counterintuitive against the common claims of researchers about student services costs of an educational institution, which was mostly noted in other research as a significant contributor to increases in retention rates of students (Musamali, 2019; Nakata et al., 2019; White, 2018). Researchers have generally claimed that allocating resources, not just in academic aspects of education may be necessary to achieve high retention rates (Webber & Ehrenberg, 2009). Nakata et al. (2019) conducted a study on the role of student services on student retention rates and degree completion, finding that student support services were effective and timely, which increased student success and retention outcomes, leading to increased completion rates. Overall, previous studies have highlighted the significant relationship between student services costs and student retention rates (Lenhardt, 2017; Musamali, 2019; Nakata et al., 2019). The findings of such research, however, were not aligned with the results of the third hypothesis of the current study in private institutions in Texas.

Theoretical Implications

The overall finding of the study is that collectively, instructional costs and student services costs were not significant independent predictors of the dependent variable, retention rates. When examined individually as dependent predictor variables, however, instructional costs significantly predicted retention rates in the state of Texas in private postsecondary institutions. Surprisingly, student services costs were not significant predictors of retention rates. Looking into the theoretical framework of Tinto's (1988) theory of institutional departure, the integration of academic experiences with social engagement are recommended to have positive influences on retention rates. In this model, Tinto acknowledged the need for academic success and a sense of belonging for students, influence the student's decision to drop out or pursue his or her academic course. In essence, the theory implies that academic success, which is aligned with instructional costs, and sense of belonging, which is aligned with services costs, are both important contributors to student retention.

The implications of the results to Tinto's (1975) theory include the possible exploration of how the model may be modified to show implications for academic success and to the sense of belonging with respect to student retention. The possibility of increasing the statistical power of the current study data may also be explored to determine whether the individual effects of the two independent predictor variables (i.e., instructional costs and student services costs) on the dependent variable (i.e., student retention rates in the state of Texas in private postsecondary institutions) will adjust from insignificance to one of significance.

Practical Implications

Based on the findings, only instructional costs and not student services costs have significant impact as a predictor of student retention rates in the state of Texas in private postsecondary institutions. Therefore,

the implication to practices in private postsecondary educational institutions in Texas will be to ensure that resources are allocated to academic instruction and not as much to student services. Given the relatively new focus on online courses, this result is consistent with the need to focus attention and resources on academic instruction over student services.

Previous researchers have shown that one of the two independent predictor variables have resulted in insignificant impact to retention. Several authors have also argued the need for institutions to allocate resources for instructional purposes to help ensure student success (Caruth, 2018; White, 2018). Belfield et al. (2016) argued that instructor performance influences the retention rates of students. A practical implication of the study findings is that resources should be assigned to ensure that instructors have the necessary skills to become effective educators. Allocating resources for training of these instructors is a possible practical implication of the current study's findings.

Future Implications

The findings of the study revealed that while both academic and nonacademic aspects of education contribute to retention rates for students in postsecondary schools in Texas, instructional services resources are primary. The findings of the study could imply that in the future, leaders in the field of postsecondary education in Texas must consider allocating resources to academic aspects pertaining to the needs of the students. These allocations may promote improved retention rates for students in postsecondary schools in Texas. The future mindset of educational leaders, especially decision-makers in their respective institutions, must be on supporting and advocating for instructional service in order to promote retention.

In line with the findings of the study, a future implication would be for further exploration outside the scope of the study, such as identifying specific instructions and services where resources must be allocated in order to promote student retention. In other settings, these explorations may also be applied in the future to determine whether the findings are indeed applicable in real-life settings, and to possibly identify aspects of the operations that may be added into the model of student retention in postsecondary schools.

Strengths and Weaknesses of the Study

The main weakness of the study is the limited sample size used, which may have led to the inability to meet the desired statistical power in the data. This is a weakness that may have implications to the findings of the study. Specifically, a below-target level of power increases the probability of Type II error. A Type II error is the failure to reject a false null hypothesis. This error may be higher for this study, as two out of three null hypotheses were not rejected.

Another weakness of the study is that the findings are only applicable to the participating private institutions in the state of Texas. The findings may not be generalized to the entire United States. This weakness could be addressed in future research. Since the data comes from reported data of institutions receiving governmental funding, a potential weakness exists from inaccurate or incomplete data reporting from the institution.

The strengths of this study include the proven predictive value of allocating resources to instruction for increased retention rates. Additional strengths include the indirect connection to Tinto's theory of institutional departure and the regional application for private postsecondary institutions in Texas. An interesting strength is the indirect need for support for online education over residential experiences in retaining students.

Recommendations for Future Research

The researcher recommends several improvements that future research may consider when studying this topic or the field of student retention in postsecondary institutions. These are the following: (a) increase or expand sample size, (b) expand geographical coverage, and (c) changes in analysis and data handling. The discussion of each recommendation is presented in the succeeding paragraphs.

The first recommendation for future scholars is to include more samples to improve the statistical power of the study. The current study had a limited sample size that was below the initially set number of datasets for the study. Increasing the sample size, per this recommendation, could decrease the probability of a Type II error, as discussed in the previous sections of this chapter. Moreover, the validity of the findings may also be improved.

The second recommendation is to expand the geographical coverage of the study beyond the current participating schools and outside of the state of Texas. With this expansion of scope, additional samples may also be necessary. Expanding the geographical area of interest may provide further insight into the problem and improve the generalizability of the findings. Additional analyses such as clustered modeling and comparison of different areas may also be performed.

The partial residual plots show a linear relationship between retention rate and instructional costs while controlling for costs of student services. Furthermore, when two different simple linear regressions are performed with instructional costs and student services costs as independent variables, respectively, only instructional costs predict retention rates. In line with these observations about the data's descriptive statistics and linear modeling, it is advised that running two separate simple linear regressions should be considered by future scholars.

Recommendations for Future Practice

One recommendation for future practice is that institutions should place value on both instructional needs and student engagement needs in the classroom experiences and beyond. This may require a different approach to allocating resources for learning and pedagogy. Moreover, in terms of resource allocation, leaders should focus attention on instructional services in budgeting and resource allocation.

Given that there is a predictive relationship between expenditures for instructional purposes, if an institution is concerned with declining retention and seeks to improve their retention rate, resources should be allocated toward instructional improvement. This may include increased development funds, tutorial systems, and focus on quality instruction.

One final recommendation is to resist the temptation to spend excess resources in student services. While these are necessary to overall operations, research shows they do not improve retention rates.

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