

**INSTRUCTION AND ACADEMIC SUPPORT
EXPENDITURES: AN INVESTMENT IN
RETENTION AND GRADUATION**

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ABSTRACT

A long-standing concern of many colleges and universities are low persistence and graduation rates. This study examined how institutions can affect, and potentially improve, persistence and graduation rates by targeting their expenditures toward those activities that have an affect on persistence and graduation. Framed by Tinto's theory of academic departure, the inquiry investigated the relationship between expenditures for instruction and academic support on persistence and graduation rates at 218 universities. The results confirmed Tinto's theory and were able to explain approximately half the variance in persistence and graduation rates among the institutions included in the study. Recommendations for practice are suggested, including using the results of the study to develop resource allocation strategies to enhance persistence and graduation rates.

Mediocre retention and graduation rates have been issues of concern in higher education for a number of years. The Wingspread Group (1993, p. 5), for example, indicated that "half of those entering college do not have a degree within five years." Student affairs programs have been developed to retain students but "comparable changes in the academic side of the house in the organization of higher education" have been less forthcoming (Tinto, 1998, p. 168). Examples of programs for students that are designed, at least in part, to improve retention and graduation rates include service learning (Eyler & Giles, 1999), learning communities (Lenning & Ebbers, 1999), and specialized residential programs

(Pascarella, Terenzini, & Blimling, 1994). Empirical evidence suggests that these interventions improve retention and graduation rates, and institutions increasingly are adopting them.

Such programs, however, are targeted at the activities of the individual student. That is, as individual students participate in these programs, they improve their chances of persisting to graduation. Embedded in this approach is that students have to be recruited to participate, must choose to participate, and then must persist actively in the program to experience the benefits of it. If students do not become actively involved in the program or drop out, presumably the benefits of participation will be diluted. While institutions develop and provide these opportunities, the success of the programs is dependent upon the student's decision to participate in them.

Another approach institutions can take to improve their persistence and retention rates is to examine their organizational behavior. Berger (2001-2002) and Kuh (2001-2002) have provided a number of recommendations for institutions along this line of thinking. Among their suggestions are that institutions should "provide opportunities for students to participate in organization decision-making" (Berger, 2001-2002, p. 14) and institutions should "Consistently use good practice in teaching, learning, and retention programs" (Kuh, 2001-2002, p. 34). The advantage of this approach is that unlike programmatic approaches that target individual students, changing the culture of an institution has the potential to affect the graduation and retention rates of all students.

The recommendations of Berger (2001-2002) and Kuh (2001-2002) identified above suggest that institutional initiatives can be developed to help meet institutional goals by modifying institutional behavior to improve retention and graduation rates. Another element of institutional behavior that potentially is underutilized is the extent to which colleges and universities are able to target their resources to achieve their persistence and graduation goals. For example, Brinkman and Morgan (1997) pointed out that budgeting and planning are not linked to the extent they should in higher education. Assuming that improving retention and graduation rates are goals of many institutions of higher education, understanding how to deploy institutional resources to improve retention and graduation rates has the potential to be valuable to institutional planners and leaders.

This study examined the influence of allocating institutional resources to academic activities on persistence and graduation rates. The allocation of institutional resources has been examined in the context of leadership development by Smart, Ethington, Riggs, and Thompson (2002, p. 115) who found "institutional expenditure patterns to have a statistically significant, albeit modest, influence on the growth of students' leadership abilities." If this study could demonstrate that allocating resources to experiences that promote student academic integration will improve persistence and graduation rates, a potentially powerful tool could be used in institutional planning, budgeting, and development.

PURPOSE OF THE STUDY

The purpose of this study was to investigate if allocating expenditures for instruction and academic support will enhance an institution's retention and graduation rates. The following questions guided this study:

1. How do expenditures for instruction and academic support influence retention rates?
2. How do expenditures for instruction and institutional support influence graduation rates?

THEORETICAL FRAMEWORK

Tinto's (1987) theory of institutional departure helped frame this study. He asserted that the more academically and socially involved individuals are, the more likely they are to persist. He also asserted that "in most cases, academic integration seems to be the more important form of involvement" (Tinto, 1998, p. 169). Using this theoretical framework, institutions have developed programs that actively engage students with their academic endeavors. Research conducted on these programs (for example, service learning or learning communities as cited above) has found that these programs have the potential to improve retention and graduation rates. However, little research has been conducted that investigates the effect of resource allocation on persistence to graduation.

METHOD

Two independent and two dependent variables were the focus of this study. Instructional expenditures and academic support expenditures were the independent variables of interest. These variables represent expenditures that promote student academic experiences, including the instructional process, and library and academic computing support (Stringer, Cunningham, Merisotis, Wellman, & O'Brien, 1999). First-year retention rate and graduation rate were the dependent variables. Definitions of the independent and dependent variables are included in Appendix A.

Procedures

The sample for this study consisted of all public and private Research and Doctoral universities as designated by the Carnegie classification system that was utilized at the time the data for this study were collected (National Center for Education Statistics [NCES], 1999). Subsequently, this taxonomy has changed (NCES, 2000). The total number of institutions included in the study was 216. This set was chosen since the total number of institutions is quite manageable for data analysis but they serve a substantial number of students. In fact, in 1998

they enrolled nearly 30% of all students in higher education and granted 47.1% of all bachelor's degrees (Carnegie Foundation, 2001).

The data were collected from several on-line data sources including the Integrated Postsecondary Education Data System (IPEDS) and the *U.S. News and World Report* "America's Best Colleges" data source. IPEDS was used to identify the 236 institutions included in the sample and the amount each of them allocated to instructional and academic support expenditures in the 1999 Survey Year, the most recent data available at the time this study was conducted. The *U.S. News* data source provided graduation and retention rates reported in 2001. The disparity in the two years is not seen as a significant methodological problem since expenditures and graduation and retention rates do not vary markedly from year to year. Data were screened for missing values and outliers. Eighteen institutions that did not provide a complete data set or had exceptionally high or low expenditures were eliminated from the data set. The resulting sample consisted of 218 universities.

Using the IPEDS data set, instructional expenditures and academic support expenditures per student (adjusted Fall headcount enrollment) were computed. Measures of central tendency by institutional type were calculated. Multiple regression was conducted to determine the accuracy of the independent variables in predicting retention and graduation rates. The level of significance chosen was .01. Evaluation of linearity led to the natural log transformation of the variables instruction and academic support.

RESULTS

The purpose of this study was to investigate the influence of instructional expenditures on retention and graduation rates. Table 1 presents the means and standard deviations for instruction expenditures per student, academic support expenditures per student, first-year retention rates, and graduation rates at public and private Research I and II and Doctoral I and II institutions.

The first research question examined the relationship between expenditures for instruction and academic support and first-year retention rates. Private Research I institutions allocated more money per headcount student than public Research I institutions to instruction and academic support and had higher first-year retention rates. Similarly, private Doctoral I institutions allocated more money than public Doctoral I institutions for instruction and academic support and also had higher first-year retention rates. Private Doctoral I institutions allocated more money than public Research I institutions on instruction and academic support but had lower first-year retention rates.

Simultaneous multiple regression results indicate that instructional and academic support expenditures significantly predicted retention rates, $R^2 = .525$, $R^2_{\text{adj}} = .520$, $F(2,215) = 118.72$, $p < .001$. Instructional and academic support expenditures were significantly correlated with first-year retention rates.

Table 1. Means and Standard Deviations of Instruction Expenditures per Student, Academic Support Expenditures per Student, Retention, and Graduation Rates for Private and Public Research I and II Institutions and Doctorial I and II Institutions

Instructional type		Instruct \$	Academic Sup \$	Retention rate	Graduation rate
Public-Research I (<i>N</i> = 83)	Mean	7078.05	2060.47	82.37	58.75
	<i>SD</i>	2591.41	1043.51	7.18	12.54
Private – Research I (<i>N</i> = 35)	Mean	17758.82	4196.12	92.40	80.89
	<i>SD</i>	7567.45	3070.61	4.97	12.18
Public – Doctoral I (<i>N</i> = 60)	Mean	4743.16	1270.07	74.07	44.28
	<i>SD</i>	1521.17	500.14	7.56	14.28
Private – Doctoral I (<i>N</i> = 40)	Mean	7857.75	2149.36	81.53	60.60
	<i>SD</i>	3813.23	1802.70	7.50	12.05

Institutions that allocated more resources to instruction and academic support had higher first-year retention rates. A summary of regression coefficients for the model predicting retention is presented in Table 2.

The second research question examined the relationship between expenditures for instruction and academic support and graduation rates. Private institutions allocated more money per headcount student than their public counterparts on instruction and academic support and had higher graduation rates. By institutional type, the more resources allocated to instruction and academic support, the higher the graduation rates.

Regression results illustrated that instructional and academic support expenditures significantly predict graduation rates, $R^2 = .563$ $R^2_{adj} = .559$, $F(2,215) = 138.72$, $p < .001$. Instructional and academic support expenditures were significantly correlated with graduation rates. Institutions that allocated more resources to instruction and academic support had higher graduation rates. A summary of regression coefficients for the model predicting graduation rates is presented in Table 3.

DISCUSSION AND IMPLICATIONS FOR PRACTICE

The results of this study are consistent with Tinto's theory of academic departure. If one assumes that as institutions allocate increasing resources to instruction and academic support, they are supporting the ability of students to be

Table 2. Summary of Simultaneous Regression Analysis for Variables Predicting Retention Rates at Research I and II and Doctoral I and II Institutions ($N = 216$)

Variable	<i>B</i>	<i>SE B</i>	β
Instruction	23.02	2.63	.58**
Academic Support	6.59	2.36	.19*

* $p < .01$. ** $p < .001$.

Table 3. Summary of Simultaneous Regression Analysis for Variables Predicting Graduation Rates at Research I and II and Doctoral I and II Institutions ($N = 216$)

Variable	<i>B</i>	<i>SE B</i>	β
Instruction	43.20	4.78	.58**
Academic Support	15.16	4.30	.23**

* $p < .01$. ** $p < .001$.

connected with their college or university in an academic sense, this study confirms Tinto's theory.

The history of institutions over the past several decades, however, suggests expenditures for instruction, as a percentage of institutional expenditures, have declined. Overall, the percentage of institutional expenditures for instruction declined for degree granting institutions by 2.0% (from 32.4% to 30.4%) from 1980-81 through 1995-96 (National Center for Education Statistics, 2001). The percentage of institutional expenditures devoted to instruction at public degree-granting institutions over the same period declined from 35.1% to 32.1%, while at private degree-granting institutions, the percentage remained the same (27.0%). Academic support expenditures have increased modestly over the same period of time. For public degree-granting institutions, these expenditures have risen from 7.2% of all expenditures to 7.6% from 1980-81 to 1996-97. Expenditures of private institutions for academic support have grown from 5.7% to 6.1% from 1980-81 to 1995-96, the most recent year reported.

The results of the multiple regression analysis conclude that instructional expenditures and academic support expenditures predict retention and graduation rates at Research I and II and Doctoral I and II institutions. This study found that as institutions spend more money on instruction and academic support, retention and

graduation rates improved. An obvious implication for practice, therefore, would be for institutions to generate more revenue and then spend it on instruction and academic support, although in an era of ever-tightening resources, that simply may not be possible and is not our primary recommendation.

In fact, a more timely approach might be to follow the advice of Astin (1985, pp. 159-160) who suggested that reallocating resources “where involvement problems are the greatest” would make sense. From this perspective, whenever possible, resources would be reallocated to support the instructional mission of the institution. The following example illustrates how that might be accomplished. At the end of the fiscal year, at some institutions money must be expended or is “lost.” At this time rather than spending money for a wide variety of purposes (i.e., enhance the motor pool, fund summer travel, or buy equipment for the recreation building), the funds could be targeted toward academic support that could include improving campus academic computing capabilities or enhancing library collections (elements of academic support activities). Having a strategy linked to improving retention would make sense rather than spending money randomly without regard to enhancing student persistence.

This study has implications for fund raising and development activities. As institutions launch fund raising campaigns, they might try to tie them to increasing persistence and graduation rates by seeking funds to support instruction and instructional support. Raising funds to endow professorial chairs designated to teaching undergraduates would be consistent with this line of thinking. The consequence could be smaller classes and other forms of support (e.g., undergraduate research assistantships) that would focus on undergraduates.

Another strategy that is supported by this study is to develop and enhance academic support experiences. By implication, such integrated learning experiences as learning communities, first-year orientation programs, service learning experiences, and residential learning communities are supported by the results of this study. These experiences, which blend in and out class learning of students, have been demonstrated to support student persistence (Astin & Sax, 1998; Lenning & Ebbers, 1999; Pascarella, et al., 1994). Allocating resources to develop these activities, as funds become available, also has the potential to improve persistence rates.

LIMITATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

Although Tinto’s assertion of academic integration shaped our focus on instruction and academic support expenditures, future studies need to examine the effects of other areas of expenditures such as student services, research, and physical plant on persistence and graduation rates. Student services have focused on providing leadership communities and support services for students outside the classroom. These activities have been shown to increase involvement and therefore enhance

retention and graduation rates (Lenning & Ebberts, 1999). Kerr (2001) has stressed the necessity of devoting monies to research because it enhances teaching. Resources allocated to research also may increase student academic involvement by providing research opportunities that allow faculty and students to work together. It is less clear, however, what direct impact expenditures for physical plant or administration may have on retention and graduation rates. In times of economic stress, information on the impact of these expenditures in relationship to instruction and academic support could provide assistance in prioritizing how resources may be allocated.

This study limited its scope to institutions that dedicate large percentages of their budgets to research and instruction. It did not consider institutions, such as small liberal arts colleges, that focus primarily on undergraduate education. Institutions classified as Baccalaureate and Master's tend to spend a higher percentage of their expenditures on instruction and academic support than Research and Doctoral institutions. The results of such inquiries could provide further insight into the relationship between instruction and academic support expenditures and retention and graduation rates.

The findings of this study suggest that the more money institutions put toward instruction and academic support, the higher their retention and graduation rates. A further question remains: "How much is enough?" If institutions were interested in allocating more resources to instruction and academic support, how much would they need to allocate to see significant results? If institutions currently have high retention and graduation rates, will allocating even more resources in these areas have a significant influence on retention and graduation rates? Future studies that examine these questions may shed additional light on the complex relationship between instruction and academic support expenditures and persistence and graduation.

Finally, this study examined expenditures for just one year. A longitudinal study, quite obviously, might yield different results. Consequently, looking at the relationship between expenditures for instruction and instructional support over time would make sense. Would the findings of such a study be similar or different to what was learned in that study? Should the results be similar, institutional leaders and planners would have still further evidence that expenditure patterns really do make a difference in persistence and graduation rates.

SUMMARY

A long-standing concern of many colleges and universities are low persistence and graduation rates. Framed by Tinto's (1987) theory of student departure, this study examined the relationship between resources allocated to instruction and academic support and persistence and graduation rates at Research I and II and Doctoral I and II universities. Using standard multiple regression, the results confirmed that resources allocated to instruction and academic support

significantly predicted graduation and retention rates. The more institutions spent on instruction and academic support, the higher their first-year retention and graduation rates. These results suggest that in a time of ever-tightening resources, resources dedicated to the instructional mission of an institution may assist institutions in maintaining or improving retention and graduation rates.

APPENDIX A

Definitions of Variables

Independent Variables

Instruction Expenditures

Expenditures of the colleges, schools, departments, and other instructional divisions of the institution and expenditures for department research and public service that are not separately budgeted should be included in this classification. Include expenditures for both credit and noncredit activities. Exclude expenditures for academic administration where the primary function is administration (e.g., academic deans). The instruction category includes general academic instruction, occupational and vocational instruction, special session instruction, community education, preparatory and adult basic education, and remedial and tutorial instruction conducted by teaching faculty for the institution students.

Academic Support

This category includes expenditures for the support services that are an integral part of the institution's primary mission of instruction, research, or public service. Include expenditures for libraries, museums, galleries, audio-visual services, academic computing support, ancillary support, academic administration, personal development, and course and curriculum development. Include expenditures for veterinary and dental clinics if their primary purpose is to support the institutional program.

Source: Integrated Postsecondary Education Data System. Finance Survey Fiscal Year 1999.

Dependent Variables

Retention Rate

Percentage of first-year freshmen who returned to the same college or university the following fall, averaged over the first-year classes entering between 1996 and 1999.

Graduation Rate

Percentage of freshmen who graduated within a six-year period, averaged over the classes entering between 1991 and 1994. (Note: This excludes transfers in the school).

Source: *U.S. News & World Report* Web site:

<http://www.usnews.com/usnews/edu/college/rankings/rankindex.htm>

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