The Influence of Financial Aid and Student Characteristics on Degree Completion Rates for a Cohort of Two-Year College Students

By George W. Metz

George W. Metz is Assistant Professor of Education at Bluffton College in Bluffton, OH.

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This study investigated the impact of student background characteristics, college experience variables, federal financial aid awards, and college outcome variables on degree completion rates for a cohort of two-year college students. A model for institutional research suggested by St. John (1992) was adapted and this study sought to determine whether financial aid awards and student characteristic variables influenced degree completion rates for the cohort of students identified in this study.

Nationwide there is an increased awareness regarding the role student financial aid plays in providing opportunities for access, enrollment, persistence, and degree completion for students enrolling in postsecondary institutions. While financial aid increases access to postsecondary education (Astin, 1975; St. John, 1990b, 1990c; Voorhees, 1985), it also has an important effect on degree completion rates (Merisotis, 1996).

Degree completion rates for community colleges, defined by Alfred (1999) as "the proportion of an entering community college cohort officially enrolled in a degree program, who actually completed a degree or certificate, and reported at annual intervals" (p. 17), are receiving attention from legislators and educators alike. Critics and proponents of higher education are placing an increased emphasis on standards for accountability and measures of success (Adelman, 1999; Alfred, Ewell, Hudgins, & McClenney, 1999; American Association of Community Colleges, 1994; Callan, 1997). Historically, two-year colleges have had difficulty in determining and measuring degree completion rates (Adelman, 1999). Students who attend two-year colleges do not always fit the typical categorization of traditional college-age students. These students tend to have more varied characteristics than more traditional college students, including age, attendance patterns, and expressed educational goals (St. John, 1990c). The typical two-year community college student is over 24 years of age, independent from parental support (according to federal financial aid guidelines), and seeks to complete coursework leading to some type of certificate or two-year terminal degree rather than a bachelor's degree (Cohen & Brawer, 1996).

More recent findings by researchers such as Astin (1993) and St. John (1991) have suggested that the effects of student

financial aid on retention and persistence may be different from earlier conclusions, where financial aid was found to have an inconclusive or a negligible impact on persistence (see Astin, 1975; Tinto, 1987). Other than statistics generated by federal and state agencies, little research exists about the influence of financial aid on access and persistence at two-year colleges. As St. John (1990a, 1994) noted, scant new research exists on the impact of student financial aid. Research focusing on factors such as financial aid and student environmental and college experience characteristics to degree completion rates at two-year colleges is limited, almost non-existent (Lafer, 1996; St. John, 1990a; Wells, 1996).

This study specifically investigates the degree completion rates for a cohort of college students at a two-year technical college located in Northwest Ohio by correlating student background characteristics (age, gender, ethnicity, high school grade point average) and college environmental variables (division enrolled and number of developmental courses taken) to any influence on degree completion rates for this cohort. Additionally, this study seeks to determine if the receipt of federal financial aid (grants, loans, work-study) influences degree completion rates for this cohort as well as determining if the intermediate college outcome variable of college grade point average also has any influence on the degree completion rates.

Current Financial Aid Research

St. John (1992) developed two models focusing on the influence of financial aid on student attendance and student persistence. Each model correlates student background variables and types of financial aid awarded and seeks to determine the effects of financial aid on student attendance patterns and student within-year persistence. Follow-up studies have investigated how the receipt of financial aid affected students across specific variables, including ethnicity (St. John & Noell, 1989), age (St. John & Starkey, 1994), institutional type (St. John, 1994), and year in college (St. John & Andrieu, 1995).

St. John's research has contradicted previous findings by Tinto (1988), who noted that financial aid did not have a significant impact on persistence. St. John (1990a) recognized that Tinto's findings on student persistence did not include the two-year college perspective. While Tinto later added the two-year perspective to his theoretical construct, there was little empirical evidence to support the findings that financial aid did not influence persistence. St. John (1992) found that previous research indicated little or no relationship between financial aid and persistence for most college students. However, his later findings (St. John, 1990b, 1990c, 1995; St. John & Elliott, 1994) suggested financial aid does have an impact on persistence.

Several other researchers, including Paulsen and St. John (1997) and Somers (1995), adopted the St. John models

to provide additional insights into factors affecting enrollment and persistence in higher education, both at two-year and four-year institutions. Overall, St. John's findings suggested recipients of financial aid do persist at a higher rate than do non-recipients. The models presented in his 1992 study are especially useful for researchers and practitioners in determining the influence of financial aid on persistence and goal attainment at the institutional level. Subsequent studies by St. John and others (see Hu & St. John, 1999; St. John 1995; St. John & Starkey, 1994; Somers, 1995) produced results similar to previous research (Voorhees, 1985) that first found that student financial aid affected persistence rates and attendance patterns. Somers (1992, 1995, 1996) investigated the effects of financial aid on various points in the matriculation process, including choice, attendance, and persistence. In her 1996 study, Somers suggested the St. John (1992) model could be employed to analyze all points along the matriculation continuum.

Methodology

This study explores individual student characteristics and degree completion rates for a cohort of students at Lima Technical College (2,500 enrollment), a two-year technical college in a non-metropolitan Northwest Ohio county with a population of approximately 154,000 (U. S. Census Bureau, 2000). A technical college is organized for the purpose of delivering postsecondary school technical education for the occupational training or general educational benefit of adults. The students for this study enrolled during the fall term 1993 and either completed degree requirements (degree awarded) or did not complete degree requirements (degree sought). Because most postsecondary institutions begin an academic year in the fall, this study used the fall quarter 1993 as the initial term for determining the cohort of first-time enrollees. This cohort of students was tracked through successive terms, ending with spring quarter 2000. A seven-year timeframe was established for this study, as many students are not able to complete their degree requirements within a two-year period.

An emphasis on the importance of reporting degree attainment rates occurred in the 1990s. The 1990 U.S. Census contained revised questions related to educational attainment that now focused on different choices in the description of type of degree awarded (Ureta & Welch, 1998). The federal government focused attention on the type of degree awarded. This change, and the responsibility of individual colleges, including two-year institutions, to report educational attainment levels, heightened the focus on accountability within the higher education community.

Additional federal legislation in the 1990s affected other areas of postsecondary education. Segments of the 1991 Student Right-to-Know and Campus Security Act as well as the 1992 Reauthorization of the Higher Education Act of 1965 (HEA)

put the focus on reporting graduation rates at the two-year college level (Biddar, 1995).

As one of its purposes, the two-year college is to award the terminal degree (Cohen & Brawer, 1996). The terminal degree function provides training, education, and experience in a specific career-oriented program allowing students to transition to the workplace immediately upon completion of a program of studies that typically takes two years to complete (Brint & Karabel, 1989; Cohen & Brawer, 1996). However, many students are not able to complete their degrees in a two-year period.

The characteristics for the degree completers are similar to the entire sample of students in the study with the following exceptions: (a) women constituted 69.5% of the completers compared with 62.9% of the total study sample; (b) 95.4% of the completers were Caucasian, non-Hispanic versus 91.6% of the sample; (c) 54.8% of the degree completers were under the age of 21, while 44.8% of the entire cohort was in this age category; (d) 7.5% of the degree completers had a high school grade point average below 2.0, compared with 20.7% of the total sample; and (e) less than 3% of the degree completers earned a GED, versus 9.0% of the sample.

This study model assumes persistence is a function of student background, college experience, and student financial aid as originally suggested by St. John, Cabrera, Nora, and Asker (2000).

This research seeks to determine whether a relationship existed between selected variables and degree completion for a cohort of students enrolled at a two-year college. One of limitations of this study was the use of a single cohort of students at one institution. The results cannot be generalized to the entire population of two-year college students and the study is not intended to reflect all factors that affect degree completion.

A second limitation is that, while this study incorporated many of the financial aid variables suggested by the St. John model (1992), it did not combine various financial aid awards as variables. For example, St. John combined aid types, such as grants and loans, or scholarships and grants. He found that the packaging of aid was more influential on persistence than were individual financial aid elements. This study only tested the influence of individual federal financial aid awards, not various combinations of financial aid awards, because other types of financial aid awards were not available from the data source.

This study model assumes persistence is a function of student background, college experience, and student financial aid as originally suggested by St. John, Cabrera, Nora, and Asker (2000). Descriptive statistics were used to delineate general information about the degree completers, and tests using correlation and linear regression were performed to determine if any of the selected variables had a statistically significant relationship to degree completion rates.

The following is an operationalized example of the formula St. John (1992) used for assessing the influence of finan-

cial aid on persistence: P= f (B, CE, A, AE, XC, FA) where P= persistence; f = function; B = social background characteristics (age, ethnicity, gender); CE = college experience; A = academic preparation; AE = academic experience; XC = extracurricular activities; FA = student financial aid. St. John (1992) found persistence to be correlated to the amount and type of financial aid awarded when student background variables such as age, ethnicity, and gender, and institutional characteristic variables such as institution size and type were part of the equation. The basic framework of the St. John study was used as the conceptual framework for this research. This current study substituted degree completion rate for the dependent variable of persistence used in the various St. John studies.

Substituting degree completion for persistence may not yield the same or similar results as the original St. John model. However, the substitution of degree completion for persistence and the elimination of other variables unavailable from the data source still provide a framework to investigate whether there was a correlation between degree completion and the identified independent variables used in this study.

Data for this research, including admissions, registration, and financial aid information were extracted from institutional computer records. Individual data for each participant were selected from the student database. Because data were retrieved for individual students on a yearly basis, adjustments to aid packages were automatically tabulated. The sample population included all students entering the college as new, first-quarter freshmen for the fall term 1993. A cohort of 760 students was identified from the enrollment records. This cohort of students was tracked through subsequent terms of enrollment ending with the spring term 2000, a seven-year period. This particular cohort was selected because its members would be the first entering class to be affected by implementation of federal legislation under the 1992 Reauthorization of the Higher Education Act of 1965, which required colleges to begin tracking degree completion rates and publishing these statistics for consumers. Under the 1992 HEA Amendments, two year colleges must report four-year graduation rates. Tabulation of descriptive statistics and linear regression were conducted to analyze the data. Table 1 illustrates the stepwise regression analysis performed or the variables predicting degree completion.

Findings

Less than one-third of all students in the cohort completed degree requirements within the seven-year time period of the study. Nearly one-half of those completing a degree were under age 20 when they first enrolled in college, while one-fifth were over age 29. About one-third of those completing a degree entered college with a high school grade point average of 3.0 or higher, but less than one-tenth entered college with a high school grade point average less than 2.0 or with a GED.

TABLE 1
Stepwise Regression Analysis for Variables Predicting Degree Completion

	Variable	Zero r	Step Beta	Final Step Beta	Final Step F Ratio
Step 1	High school grade point average	.36 **	.36	.14 **	98.1
Step 2	Federal Work-Study	.15 **	.16	.10 **	59.6
Step 3	Federal loans	.12 **	.07	.07 *	41.3
Step 4	Public services division	.11 **	.16	.14 **	36.9
Step 5	Remedial courses	-.15 **	-.10	-.11 **	31.1
Step 6	College grade point average	.44 **	.46	.46 **	59.1

Note. R^2=.35 (N=649, $p < .01$); * $p < .05$; ** $p < .01$.

The average college grade point average earned by the degree-completing cohort was 3.0, while the entire cohort in this study had a college grade point average of 2.3. More than one-half of the entire cohort did not enroll in any remedial courses. Almost two-thirds of those completing a degree did not enroll in any remedial coursework.

Federal loans and Federal Work-Study (FWS) were positive predictors of degree completion for the cohort, but Federal Pell Grants did not significantly influence degree completion. Almost half of all students in the study received financial aid in the form of loans, grants, or FWS. Several student background characteristics (age, gender, ethnicity, high school grade point average) and college experience characteristics (division enrolled and number of remedial courses taken) influenced degree completion rates, as well. Only one college experience variable, enrollment in remedial courses, was a negative influence on degree completion rates. College grade point average was found to be the most influential variable predicting degree completion rates for this cohort of students.

The influence of the loan and work-study awards on degree completion rates for this cohort does not parallel previous research findings (Somers & St. John, 1993; St. John, 1990b, 1990c, 1994; St. John & Andrieu, 1995; St. John, Hu & Weber, 2000; St. John & Noell, 1989). St. John and his various colleagues found a combination of grants and loans, as well as other financial aid awards (scholarships), influenced persistence and degree attainment with little reference to the impact of college work-study. They also found that inadequate grant aid for the needy generally had a negative influence on persistence and found loans to be a negative influence on persistence.

Conversely, this study showed that participating in the federal student loan programs provided a positive impetus to completing the degree. The fact that loans were a significant positive predictor for attaining the associate's degree poses three

interesting points: (a) federal financial aid policies currently in place, which emphasize a reliance on loans and a preponderance of student borrowing, are not necessarily a detriment for students as they pursue a degree; (b) students who borrow to pay for a college education, thereby taking personal ownership and financial responsibility for participating in higher education, may possess attributes that should be considered when investigating why these students persist to graduation; and (c) student consumer behavior toward borrowing may be a positive experience in relation to degree completion, at least at low-cost two-year colleges, as suggested by certain policy analysts (e.g., Mortenson, 1998). The use of a single cohort of students at one institution limits this study as it does not have generaliz-ability to the entire population of two-year college students.

A greater percentage of undergraduates in this study who participated in the FWS program completed degree requirements than those who did not. The positive influence of FWS on degree completion for this cohort supports Astin's (1993) student involvement theory that student persistence is affected by involvement in college. Astin noted participation in the FWS program was a positive influence on student persistence for four-year college students.

The findings related to financial aid influences on degree completion rates provide students, college administrators, and policy analysts with two major challenges in understanding the role of financial aid in the matriculation process. First, the issue of student loan indebtedness continues to be a focus of many within the financial aid community, as students struggle to balance academic, personal, and financial constraints in their pursuit of a college degree. Reliance on debt to obtain a college degree adds to the growing controversy on college affordability and the discussion by some as to the economic benefits of a college degree. Second, because the FWS program is a positive influence on degree completion rates, a concern for integrating work into an already crowded schedule may become burdensome for some students, especially for those at a two-year technical college, who tend to be non-traditional students with family, outside employment, and other responsibilities. Adding one more activity may not be feasible for some of these students.

Conclusions

As higher education competes for funding, college administrators seek to provide data reflecting satisfactory achievement of standards of institutional effectiveness. The results from this study suggests two-year colleges may be at a distinct disadvantage, as the existing analysis techniques require institutions to report the number of students who attain a degree. For researchers studying the role of two-year colleges in American higher education and ascertaining whether these institutions are effective, this study provides three opportunities for enhanced investigation.

First, this study's findings indicate financial aid to be a positive influence on degree attainment. While this finding supports previous research by St. John and others over the past thirty years, prior studies have also shown the impact of financial aid on persistence and goal attainment to be mixed. This study's findings that loans are a significant positive predictor of degree completion adds to the growing controversy about federal financing of higher education and the increased reliance on loans to fund education. The fact that grants did not emerge as a significant predictor of degree completion further adds to the confusion and uncertainty about exactly what influence specific types of financial aid awards have on access, persistence, and degree completion. The influence of FWS, in particular, as a positive predictor of degree completion further adds to the existing research of student involvement and institutional interaction theories, suggested by Astin and Tinto. For higher education personnel, the implication is an increased attention to the effects of student involvement on persistence and goal attainment for those students participating in the FWS program.

The fact that grants did not emerge as a significant predictor of degree completion further adds to the confusion about exactly what influence specific types of financial aid awards have on access, persistence, and degree completion.

Second, the data from this study are from an individual institution. Two-year colleges are distinct institutions, and this study provides evidence of that uniqueness by identifying specific challenges to degree completion at the local level. The influence of remediation, for example, as a negative predictor of degree completion brings attention to the challenges two-year colleges have in attempting to meet the needs of its diverse clientele. Relationships with the K-12 sector to partner curricular changes and to relate academic expectations would be one alternative to bridging the academic preparedness chasm experienced by some students from specific locales. Understanding student background characteristics is an important component in assisting students toward degree completion. This study found that high school grade point average, for instance, was positively correlated to degree attainment. Understanding the impact of high school grade point average as a predictor of degree completion may provide opportunities at various levels for interventions to occur that may improve completion rates.

Third, this study's findings provide evidence of institutional effectiveness, as nearly one-third of the cohort attained a degree. Institutional effectiveness is as distinctive as a student's individual identity. The failure to have reporting requirements delineating the distinctive nature of the two-year college may force some institutions to meet with negative reaction from various constituents. By providing a consistent and comprehensive reporting mechanism focused on the unique identity of the two-year college structure, research findings may better illuminate the successes of two-year colleges, thereby diminishing a perception of institutional ineffectiveness.

This study provides additional insights into whether student financial aid programs address the challenges of access, persistence, and degree attainment (St. John, 1995). Discussion in the financial aid community about the impact of loans and grants on persistence and degree completion continues. More research is needed to understand the significance of the total financial aid awarding process on matriculation processes (Merisotis, 1996; Mortenson, 1998).

Student enrollment in remedial coursework is a significant negative predictor of student degree completion. Thus, the role of academic advising in assisting students to meet with academic success may become more important as more students enter postsecondary education unprepared for a college curriculum (Hu & St. John, 1999; Ryder, 1994). The scheduling of remedial education, such as not having students enroll concurrently in all remedial coursework in one term, may be as important as the number of courses for which students register.

Recommendations

The study demonstrates that students who enter college with low high school grade point averages are less likely than others to complete degree requirements. Additionally, the strong correlation between high school grade point average and placement in remedial coursework suggests that early intervention strategies are needed to improve students' opportunities to complete degrees. Pre-enrollment advising, including ascertaining career and educational intent, may help students to succeed. The involvement of others in structured, pre-enrollment strategies is necessary in today's dynamic education setting, particularly the two-year college. Appropriate follow-up throughout a student's enrollment should also be adopted for those students who enter college at the last moment.

The use of institutional data will become more frequent and will be expected by the many constituencies involved with policymaking and governance (Alexander, 2000). Although the "public has no basis for gauging the quality of completion rates, and there are not established standards" (Nettles & Millett, 2000, p. 2) there is need for these institutions to relay information that best reflects the successes and challenges to institutional effectiveness, including degree completion rates. Institutional data must be developed, unless the institution becomes subject to de facto governance from those outside academe.

Future Research Opportunities

Several opportunities exist for continued research on the influence of financial aid on persistence and degree attainment. First, it is necessary to incorporate all types of financial aid, including but not limited to private and institutional scholarships, private loans, and third-party tuition payment plans, into studies of the influence of financial aid on degree completion. Incorpo-

rating all types of financial aid into future studies would provide additional information about financial factors that may influence degree completion, persistence, and retention rates (Alfred et al., 1999).

Second, this study focused on students who completed degrees rather than those who did not. Although students may be meeting individual goals and career success, no tracking system is in place to identify these goals and whether they are being achieved. Specific findings by Wellsfry (1995) suggested access and participation need to be linked to student intent and individual goals. The reporting of data listing degree attainment rates fails to provide opportunities for an institution to report individual student success. Composite data do not allow for descriptions of goal attainment; rather, degree completion is assumed to be the objective for all students who enter higher education. Nettles and Millett (2000) observed that, "[Two-year] colleges must examine the completion rates and decide how to convey to the public, either that these are acceptable levels of completion and why, or set up a rate that we should aspire to achieve" (p. 2).

The use of a survey with open-ended questions or individual student interviews might produce additional non-quantifiable evidence of obstacles and influences on degree attainment.

Third, students who enroll in college with low high-school grade point averages and subsequently need to enroll in remedial course work have less success in completing degrees. Therefore, it is easy to suggest that early intervention strategies at the middle school and secondary level can reduce potential impediments to degree completion in college. Studies focusing on the influence of pre-college programs seem appropriate. Such programs include School-to-Work and Tech Prep initiatives, and GEAR-UP. These programs were instituted to increase the number of low-income students who are prepared to enter and succeed in postsecondary education. High school internships and partnerships established by two-year colleges with federal, state, and private agencies add new opportunities to examine college access and persistence (Alfred et al., 1999).

Fourth, qualitative data might produce additional insights into why students do not complete degree requirements. Although time-consuming, the use of a survey with open-ended questions or individual student interviews might produce additional non-quantifiable evidence of obstacles and influences on degree attainment, such as student intent and aspirations, perceptions about institutional quality, and feelings of belonging to the college community, as suggested by Metzner and Bean (1987) and Tinto's social integration theory (1993).

Finally, the positive influence of participation in the FWS program on degree completion rates suggests that additional insights might be gained by investigating student academic and social involvement. Further investigation of Astin's Involvement Theory (Astin, 1993) may provide insights into other factors affecting degree completion and goal attainment for the two-year college student.

The St. John models serve as a framework for guiding the research questions that identify those factors affecting degree completion for students at a two-year college. The policy implications for meeting the differing needs of two-year college students affect various constituencies, including college administrators, government legislators, and potential college students and their families. Among the challenges for college administrators are developing ways to review financial aid packaging policies; providing low-cost, affordable tuition without students incurring significant debt levels; evaluating the costs of attending college; and weighing the potential long-term economic benefits to students of degree attainment.

This study was undertaken to determine specific student characteristics and federal financial aid influences on degree completion rates for a specific cohort of students at a two-year technical college. Several student characteristics, specifically college division, high school grade point average, college grade point average, and enrollment in developmental courses, were found to have a significant influence on the likelihood of a student completing an associate's degree. Federal financial aid was also found to have an influence, in certain situations, on degree completion rates for this cohort. The results of this study provide opportunities for administrators at 2-year colleges, legislators, policy analysts, and students to review potential risks for future student success and to promote discussion as to the future evaluative criteria needed to judge institutional effectiveness and student success.

References

Adelman, C. (1999). *Answers in the toolbox: Academic intensity, attendance patterns, and bachelor's degree attainment.* Jessup, MD: Education Publications Center.

Alexander, F. K. (2000). The changing face of accountability: Monitoring and assessing institutional performance in higher education. *Journal of Higher Education, 71*(4), 411-431.

Alfred, R., Ewell, P., Hudgins, J., & McClenney, K. (1999). *Core indicators of effectiveness for community colleges: Toward high performance.* Washington, DC: American Association of Community Colleges. (ERIC Document Reproduction Service No. ED 426 749)

American Association of Community Colleges. (1994). *Community colleges: Core indicators of effectiveness* (AACC Special Report No. 4, A Report of the Community College Roundtable). Washington, DC: Author.

Astin, A. W. (1975). *Financial aid and student persistence.* Los Angeles: Higher Education Research Institute. (ERIC Document Reproduction Service No. ED 112 804)

Astin, A. W. (1993). *What matters in college? Four critical years revisited.* San Francisco: Jossey-Bass.

Callan, P. M. (1997). Stewards of opportunity: American public community colleges. *Daedulus, 126*(4), 95-112.

Cohen, A. M. & Brawer, F. B. (1996). *The American community college* (3rd ed.). San Francisco: Jossey-Bass.

Hu, S. & St. John, E. P. (1999). *Student persistence in a public higher education system: Understanding racial/ethnic differences.* Paper presented at NASSGAP/NCHELP Research Network Conference, Savannah, GA.

Metzner, B. S. & Bean, J. P. (1987). The estimation of a conceptual model of nontraditional undergraduate student attrition. *Research in Higher Education, 27*(1), 15-37.

Mortenson, T. (1998). How will we do more with less?: The public policy dilemma of financing postsecondary educational opportunity. In R. Fossey & M. Bateman (Eds.) *Condemning students to debt: College loans and public policy* (pp. 37-46). New York: Teachers College.

Merisotis, J. P. (1996). *The 1997 Reauthorization of the Higher Education Act: An analysis of the current policy environment.* Washington, DC: Institute for Higher Education Policy. (ERIC Document Reproduction Service No. ED 393 375)

Nettles, M. T. & Millett, C. M. (2000). *Student access in community college. New expeditions: Charting the second century of community colleges.* Issues paper No. 1. Washington, DC: American Association of Community Colleges. (Eric Document Reproduction Services No. ED 438 872)

Paulsen, M. B. & St. John, E. P. (1997). The financial nexus between college choice and persistence. In R. A. Voorhees (Ed.) *Researching student aid: Creating an action agenda.* (pp. 65-82). San Francisco: Jossey-Bass.

Ryder, R. A. (1994). Nontraditional students: Perceived barriers to degree completion. *College Student Affairs Journal, 13*(12), 5-13.

St. John, E. P. (1990a). *The impact of student financial aid: A review of recent research.* (ERIC Document Reproduction Series No. ED 334 894)

St. John, E. P. (1990b). Price response in enrollment decisions: An analysis of the High School and Beyond sophomore cohort. *Research in Higher Education, 31*(2), 161-176.

St. John, E. P. (1990c). Price response in persistence decisions: An analysis of the High School and Beyond cohort. *Research in Higher Education, 31*(4), 387-403.

St. John, E. P. (1991). The impact of student financial aid: A review of recent research. *Journal of Student Financial Aid, 21*(1), 18-32.

St. John, E. P. (1992). Workable models for institutional research on the impact of student financial aid. *Journal of Student Financial Aid, 22*(3), 13-26.

St. John, E. P. (1993). Untangling the web: Using price-response measures in enrollment projection. *Journal of Higher Education, 64*(6), 676-695.

St. John, E. P. (1994). The influence of student aid on within-year persistence by traditional college-age students in four-year colleges. *Research in Higher Education, 35*(4), 455-480.

St. John, E. P. (1995). Rethinking tuition and student aid strategies. In E. P. St. John (Ed.) *Rethinking tuition and student aid strategies* (pp. 95-110). San Francisco: Jossey-Bass.

St. John, E. P. & Andrieu, S. C. (1995). The influence of price subsidies on within-year persistence by graduate students. *Higher Education (29)*, 143-168.

St. John, E. P., Cabrera, A. F., Nora, A., & Asker, E. H. (2000). Economic influences on persistence reconsidered. In J. M. Braxton (Ed.), *Reworking the student departure puzzle,* (pp. 29-47), Nashville, TN: Vanderbilt University.

St. John, E. P. & Elliott, R. J. (1994). Reframing policy research: A critical examination of research on federal student aid programs. In J. C. Smart (Ed.) *Higher education: Handbook of theory and research* (pp. 126-180). Bronx, NY: Agathon.

St. John, E. P., Hu, S., & Weber, J. (2000). Keeping public college affordable: A study of persistence in Indiana's public colleges and universities. *Journal of Student Financial Aid, 30*(1) 21-32.

St. John, E. P. & Noell, J. (1989). The effects of student financial aid on access to higher education: An analysis of progress with special consideration of minority enrollment. *Research in Higher Education, 30*(6), 563-581.

St. John, E. P. & Starkey, J. B. (1994). The influence of costs on persistence by traditional college-age students in community colleges. *Community College Journal of Research and Practice, 18,* 201-213.

Somers, P. A. (1992). A dynamic analysis of student matriculation decisions in an urban public university. (Doctoral dissertation, University of New Orleans, 1992). *Dissertation Abstracts International, 53,* 2269.

Somers, P. A. (1995). Evaluating institutional student aid policies. In E. P. St. John (Ed.) *Rethinking tuition and student aid strategies,* (pp. 65-74). San Francisco: Jossey-Bass.

Somers, P. A. (1996). The influence of price on year-to-year persistence of college students. *NASPA Journal, 33,* 99-104.

Somers, P. A. & St. John, E. P. (1993). The impact of financial aid on enrollment decisions. *Journal of Student Financial Aid, 23*(3), 7-12.

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

Tinto, V. (1988). Stages of student departure: Reflections on the longitudinal character of student learning. *Journal of Higher Education, 59*(4), 438-453.

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

U. S. Census Bureau (2000). U.S. Census. Retrieved December 8, 2000, from *http://www.census.gov/population/estimates/county/co-99-1/99C1_39.txt*

Voorhees, R. A. (1985). Financial aid and persistence: Do federal campus based aid programs make a difference? *The Journal of Student Financial Aid, 15*(1), 21-30.

Wellsfry, N. (1995). *Accountability in community colleges: Balancing the perception with reality.* (ERIC Reproduction Document Service No. ED 405 049)