

Prior College Credit of First Semester Freshmen: Does it Make a Difference?



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Abstract

Supporters of concurrent enrollment programs tout its many benefits to students, parents and involved institutions; however, findings from related studies vary widely. Limited research has been conducted within colleges of agriculture to explore this concept. As more and more students enter college having earned a substantial number of college credits while concurrently completing their secondary education, it is essential to determine the value of such experiences. To that end, the purpose of this study was to explore the suggested value of prior college credits in relationship to student performance, retention, and degree completion in college. The population for this study consisted of entering college freshmen (1998) in the College of Agriculture, Food and Natural Resources at the University of Missouri. Findings revealed that students who began college with prior college credit did experience greater academic performance during their first year of college than students who entered with no prior credit. A relationship was also found between the number of prior college credits and academic retention and degree completion in college. Finally, a small amount of unique variance in academic performance could be accounted for by prior college credits when controlling for high school core grade point average and ACT score.

Introduction

According to McKeon, "Every student deserves the opportunity to pursue his or her educational goals" (2003, p. 1). Indeed, few people will dispute that statement. However, reality is not quite that simple. The truth is that a college education is not always within the grasp of every individual who may desire one. According to a report of the Advisory Committee on Student Financial Assistance (ACSFA), approximately one-half of all "college-qualified, low- and moderate-income high school graduates" in 2002 were unable to afford an education at a four-year institution (ACSFA, 2002, p. v). With the ever-rising cost of college, there are many instances in which students and their families cannot afford college (McKeon). In fact, within this decade, over two million college-qualified high school students will not attend college due to financial barriers (ACSFA, 2002).

Several options exist to assist prospective college students and their families with the rising costs of higher education. One option currently being utilized is concurrent enrollment. Sometimes referred to as dual credit or dual enrollment, "*concurrent enrollment is the term used to describe programs that permit high school students to enroll in college-level courses prior to graduation*" (Greenberg, 1989, p.7). In such cases, students not only earn credit toward their high school diploma, but also earn college credit.

Supporters of concurrent enrollment tout several benefits. According to an issue paper of The High School Leadership Summit (United States Department of Education, n.d.), such programs:

- Prepare students for the academic rigors of college by exposing them to the type of intense curriculum that research has found to promote bachelor's degree attainment.
- Lower the cost of postsecondary education for students by enabling them to earn free college credits (depending on state policy) and shorten their time to degree completion.
- Provide students with more realistic information about the academic and social skills that they will need to succeed in college through their participation in actual college courses.
- Provide curricular options for students, particularly in high schools that, due to small size or inadequate funding, are unable to offer interesting and exciting electives. (p. 1)

There are benefits of concurrent enrollment for both students and parents. For students, they have the opportunity to earn college credit while still in high school which allows them to complete college programs at a more rapid rate or take major-specific courses earlier than most students (Greenberg, 1989). A second benefit, experienced by students and parents alike, is a reduction in tuition costs. With courses at many colleges costing over \$300 per credit hour, a three-credit concurrent enrollment course can potentially save students and parents approximately \$1000 (Greenberg).

Andrews (2001) described the growth of dual credit observed as "explosive." According to a report by the Southern Regional Education Board (SREB), it is estimated that the number of students enrolling in dual enrollment courses increased from 100,000 to 500,000 students between 1993 and 2003 (SREB,

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2006). This drastic increase generates questions as to why so many high school students are now pursuing this opportunity. Why are there so many students taking advantage of this opportunity? What are the benefits realized by these students? Are students who take such classes better prepared for college? What impact, if any, does pre-college enrollment have on college success? These are just a few of the questions being asked by faculty and administration at higher education institutions.

Limited research has been conducted to determine the effectiveness of concurrent enrollment programs (United States Department of Education, n.d.). Most of the research published is descriptive in nature or primarily based upon opinions and attitudes toward the programs. The existing literature that addresses outcomes varies greatly (United States Department of Education).

One study, conducted by the University of Arizona, found that “students who participated in either Advanced Placement (AP) or concurrent enrollment (or both) experienced lower drops in their grade point average (GPA) during their freshman year when compared with other University of Arizona freshmen” (United States Department of Education, n.d., p. 1). A second study, conducted with first-time, full-time students within the four campus system of the University of Missouri found, when controlling for academic ability, that students with AP credit tended to have higher first-year GPAs than students entering with only concurrent enrollment credits or with no previous college credit at all (Eimers & Mullen, 2003). In addition, students with only concurrent enrollment credits did not appear to perform significantly better than students entering with no previous credits (Eimers & Mullen). A difference was noted with regard to the source of the concurrent enrollment credits. Students who earned credits from a four-year institution tended to have a higher first year GPA than students who earned credits from a two-year institution (Eimers & Mullen).

With regard to retention, students who entered college with either AP or concurrent enrollment credits displayed a higher retention rate than students who entered with no previous credits (Eimers & Mullen, 2003). Delicath (1999) found both concurrent enrollment credit and AP credit positively correlated with student retention into the sophomore year. In this particular study, concurrent enrollment and AP were also found to be positively correlated with graduating within five years (Delicath).

The conceptual framework which served as the basis of this study was an adaptation of Terenzini and Reason's (2005) model for studying college impact. The model, created from research by Pascarella and Terenzini (1991, 2005) and Terenzini and Reason (2005), was designed to

investigate issues relating to student success and persistence in the first year of college. The framework identifies three primary categories of variables involved in the study of college impact (Figure 1). The three categories include: pre-college characteristics and experience, the college experience, and outcomes. The initial framework has been adapted to meet the needs of studying college student development. Information including sociodemographic characteristics, academic preparation, ability and performance as well as personal and social experiences were added to the pre-college characteristics and experience category. Slight modifications were also made to the college experience category. Sub-categories were adapted to include institutional environment and student experiences. Peer interaction was incorporated into the sub-category of student experiences. Finally, the outcomes identified in the revised model were changed from learning, development, change and persistence to learning/development, persistence and career/job satisfaction. Additionally, specific measures were identified for the revised outcomes.

Pre-college characteristics and experiences encompass diverse factors which relate to the backgrounds and experiences of students. Included among these diverse factors are sociodemographic factors, academic preparation, ability and performance, and personal and social experiences. Each of these characteristics can have “*powerful influences on students' subsequent college experiences, learning, development, change, and persistence*”

(Terenzini & Reason, 2005, p. 6). Based upon this model, participation in concurrent enrollment programs would be considered pre-college experience since credit hours earned apply to both secondary and postsecondary degree requirements.

The college experience component of the framework includes not only the institutional environment, but also student experiences. First, the college experience is influenced by the institutional environment of the college or university. Factors including institutional structures, policies, and practices; academic and co-curricular programs, policies and procedures; and faculty culture and experiences all may potentially influence students' experiences. Students' college experiences are largely influenced by formalized learning experiences, out-of-class experiences and peer interaction. For this particular framework, formalized learning experiences include such factors as curriculum, and classroom or laboratory learning. Out-of-class experiences include factors such as academic advising, educational internships, and participation in student organizations. Finally, peer interaction includes living environment, participation in freshman interest groups, sororities, fraternities, and involvement in student organizations.

The outcomes component indicates the various results or products of students' personal and educational experiences, both pre-college and college related. Potential outcomes include learning and

development, persistence and career/job satisfaction. This component seems to draw certain focus as, unfortunately, challenges with academic performance and retention of students plague universities. Altogether, too many students who begin college fail to earn a degree (Carey, 2004). A substantial number of students do not continue their collegiate academic career past their freshman year. According to an ACT news release based on national data, nearly one fourth of undergraduate students do not return to their chosen four-year college or university for a second year (ACT, 2005). In addition, only 60% of entering freshman at four-year colleges or universities have been found to complete their bachelor's degree within six years (Carey, 2004).

Additional research is warranted to explore the influence concurrent enrollment has on students' academic success and retention in college. As more and more secondary students are encouraged to enroll in college courses while in high school, research must be conducted to address the potential benefits of such opportunities. Particularly, within a college of agriculture, does entering college as a freshman with prior college credits lead to greater academic success and/or retention?

The purpose of this study was to explore predictors of academic performance, retention, and degree completion of college of agriculture students. The following research hypotheses were developed to guide the study and applied to freshmen entering the college:

- **H₁**: Students who enter college with prior college credits have greater academic performance during their first year than students with no prior credits.
- **H₂**: A statistically significant relationship exists between the number of college credits earned prior to college matriculation and retention to the sophomore year.
- **H₃**: A statistically significant relationship exists between the number of college credits earned prior to college matriculation and degree completion.
- **H₄**: A statistically significant variance in first year college grade point average (GPA) can be accounted for by previous college credits while controlling for university admissions criteria (High School Core GPA and ACT Score).

Methods

The target population for this *ex-post facto* study was freshmen entering the College of Agriculture, Food and Natural Resources at the University of Missouri in the fall of 1998 (N = 376). For the basis of this study, students entering the University for the first time with less than 30 credit hours and less than 24

credit hours from a single institution were considered freshmen. Prior college credit was operationally defined as any college level credit earned prior to a student's first semester of enrollment at the university. These hours could have been obtained through dual enrollment programs or earned by students through evening or summer courses. The data were obtained from student admissions records through the college's academic programs office.

Students' academic performance was measured by cumulative grade point average (CGPA) at the completion of the freshman year. Retention was based on a student returning for his/her second year (sophomore) of college. Degree completion was based on whether or not a student completed his/her degree program within five years following matriculation.

Research hypothesis one was analyzed using an independent samples t-test, while research hypotheses two and three utilized Point-Biserial correlations, interpreted using Hopkins (2002) descriptors. Research hypothesis four was tested using Hierarchical Multiple Linear Regression. An alpha level of .05 was established a priori for all statistical tests.

Results & Discussion

Research hypothesis one stated that first semester freshmen who enter college with prior college credit will have greater academic performance than first semester freshmen with no prior credit. For the sake of statistical analysis, the following null hypothesis was tested:

H₀₁: There is no difference in academic performance between first semester freshmen who enter college with prior college credit and first semester freshmen who enter with no prior credit.

Findings of this analysis indicated that of the 376 first semester freshmen, the majority (61%, n = 228) had earned prior college credit while the remainder (39%, n = 148) began degree programs with no prior college credit (see Table 1). The range in prior college credit was 32. Of students entering with prior credits, the average number of credits earned was 11.3. The mean first year college grade point average for freshmen with prior college credit was 2.86 (SD = .72). Conversely, the mean first year college grade point average for students with no prior college credit was 2.54 (SD = .92).

Credit Status	n	Mean	SD	t-value	p-value
Prior Credit	228	2.86	.72	-3.58	.01*
No Prior Credit	148	2.54	.92		
*p ≤ .05					

Based on Levene's test for equality of differences, equal variances were not assumed (F = 7.82, p ≤ .05). In

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order to derive a p-value for this one-tail t-test, the observed p-value was divided by two. Findings indicate that, on average, students who entered college with prior college credits had significantly higher first year cumulative grade point averages than students who entered with no prior credits (t_{261}

$= -3.58, p \leq .05$). Utilizing Cohen's d, a medium effect size was found ($d = .40$). Therefore, the null hypothesis was rejected in favor of the research hypothesis.

Research hypothesis two stated that a significant relationship exists between the number of prior college credits a student earns and academic retention. The following null hypothesis was tested:

H0₂: There is no relationship between the number of prior college credits and student academic retention.

A Point-Biserial correlation was used to describe the relationship between the number of prior college credits earned and academic retention

Prior College Credit	Not Retained (n = 54)		Retained (n = 318)	
	f	%	f	%
0	29	53.7	158	37.1
1 – 5	6	11.1	44	13.8
6 – 10	7	13.0	57	17.9
11 – 15	8	14.8	43	13.5
16 – 20	3	5.6	30	9.4
21 – 25	1	1.9	17	5.3
26 and greater	0	0.0	9	2.8

$r_{pb} = .13; p \leq .05$

(from freshmen to sophomore year). According to Hopkins (2002), a positive, low significant relationship was found ($r = .13, p \leq .05$) (see Table 2). Based on these findings, the null hypothesis was rejected in favor of the research hypothesis which states that a relationship exists between the number of prior college credits and academic retention.

Research hypothesis three stated that a relationship exists between the number of prior college credits a student earns and degree completion. To aid in the analysis the following null hypothesis was tested:

H0₃: There is no relationship between the number of prior college credits and student degree completion.

A positive, low, significant relationship (Hopkins, 2002) was found between the number of prior college credits earned and degree completion

($r = .17, p \leq .05$) (see Table 3). Based on these findings, the null hypothesis was rejected in favor of the research hypothesis which states that there is a relationship between the number of prior college credits earned and degree completion.

Prior College Credit	Did Not Earn Degree (n = 110)		Degree Earned (n = 266)	
	f	%	f	%
0	60	54.5	88	33.1
1 – 5	7	6.4	43	16.2
6 – 10	17	15.5	49	18.4
11 – 15	16	14.5	35	13.2
16 – 20	8	7.3	26	9.8
21 – 25	2	1.8	16	6.0
26 and greater	0	0.0	9	3.4

$r_{pb} = .17; p \leq .05$

Research hypothesis four stated that a significant unique variance in first year GPA can be accounted for by prior college credits while controlling for university admissions criteria. For statistical analysis, the following null hypothesis was tested:

H0₄: A statistically significant variance in first year GPA is not accounted for by prior college credits while controlling for academic admissions criteria.

To explain the variance uniquely accounted for in first year college grade point average by prior college credits, hierarchical multiple linear regression was used. The control variables of high school core

grade point average (GPA) and ACT score were entered first. Combined, these variables accounted for 39% ($R^2 = .39; F_{2,362} = 114.44$) of the variance in first year college grade point average. When prior college credits, the variable of interest, was entered into the regression model with the control variables, 40% ($R^2 = .40; F_{1,361} = 79.74$) could be explained. The change in first year college grade point average, after accounting for the control variables, was found to be significant (R^2 Change = .01, $p \leq .05$). Based on these findings, the null hypothesis was rejected in favor of the research hypothesis which states that a significant variance in first year GPA is accounted for by prior college credits while controlling for university admissions criteria.

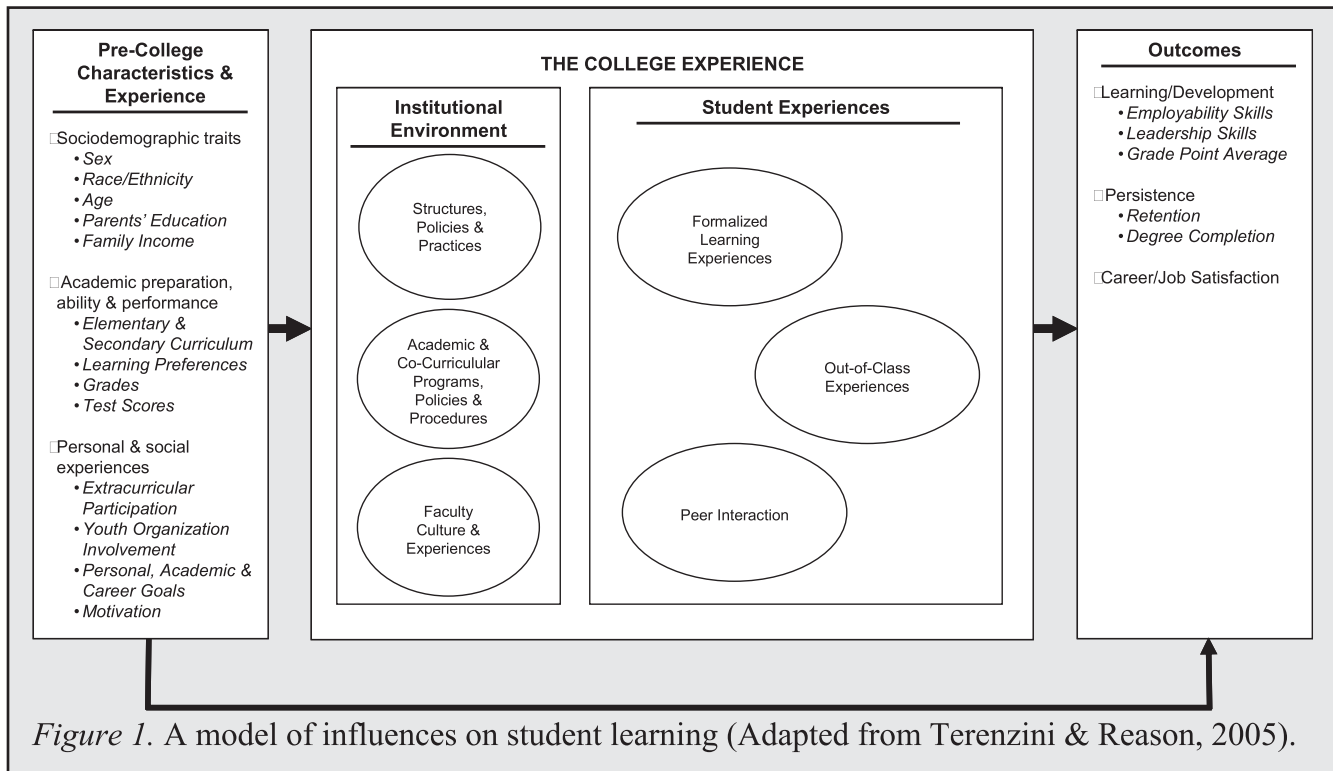


Figure 1. A model of influences on student learning (Adapted from Terenzini & Reason, 2005).

Table 4. Hierarchical Regression of First Year GPA on Control Variables and Pre-College Credits

Variable	R ²	R ² Change	b	t-value	p-value
Control Variables					
High School GPA	.39	.39	.78	9.74	.01*
ACT Score			.03	2.95	.01*
Variable of Interest					
Previous College Credits	.40	.01	.01	2.59	.01*
(Constant)			-.66		

* p ≤ .05

performance during their first year of college. Findings from the University of Arizona support this argument and indicate that students who earned credits through Advanced Placement or concurrent enrollment experienced lower drops in grade point average during their freshman year of college (United States Department of Education, n.d). Additionally, research

Summary

First semester freshmen who began college with prior college credit, earned through concurrent enrollment, achieved higher cumulative grade point averages (CGPA) at the completion of the first year of college. There was a statistically significant difference in mean CGPA between the two groups of students – those who began college with prior credit and those who did not. In addition to the statistical significance, a practical difference existed among the CGPA of students in the two groups as well. Often continuing education scholarships are contingent on students' grade point averages, with many utilizing 2.75 as a minimum GPA. In such cases, a .32 difference in GPA could potentially mean the difference between receiving a scholarship (2.86) and not receiving one (2.54).

Supporters of concurrent enrollment programs argue that students who participate in such programs and take college-level courses while in high school should achieve higher levels of academic

involvement. Running Start, a concurrent enrollment program in Washington, expressed similar findings. Grade point averages of students involved in the program were higher than students not involved in the program (Andrews, 2004). Because these students have experienced the rigor of college-level courses, it would seem realistic that they would have fewer struggles with the academic requirements at college and more easily adjust to college expectations. If this is the case, high schools across the country should continue to seek out concurrent enrollment opportunities for students to better prepare them for college and beyond.

A positive, low, significant relationship was found between the number of prior college credits earned by a student and retention (from freshman to sophomore year). This indicates that, on average, students who enter college with prior credits tend to be retained at a higher rate than those who enter with no prior credits. This finding is consistent with previous research (Eimers and Mullen, 2003; Delicath, 1999).

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Many of the college students who fail to return for their second year do so because of academic or financial struggles. Through the utilization of concurrent enrollment, both of these issues can be addressed. Because concurrent enrollment programs expose students, while in high school, to the structure and expectations of college courses, it is arguable that students who participate in such programs are more college-ready than students who do not. This readiness may help alleviate some of the academic struggles that students face. Additionally, in many situations, school districts that offer concurrent enrollment to their students typically absorb the costs for the courses taken. This helps to reduce the total amount of money that is spent out-of-pocket for a college education and allows students to avoid borrowing (or borrow less) to finance their education.

If prior college credits have a significant relationship with academic retention, what relationship, if any, is there with degree completion? Can the benefits of concurrent enrollment programs be extended to include degree completion as well? Many suggest that students of concurrent enrollment program take less time to complete their degree programs; however, does taking prior college classes equate to greater completion rates?

This particular study found a positive, low, significant relationship between the number of prior college credits earned and degree completion. This suggests that, on average, entering freshmen who begin college with prior college credits are more likely to complete their degree program within five years. Delicath (1999) also found similar results that indicated concurrent enrollment and AP credit was positively correlated with college graduation, or degree completion.

Related research as reported in the United States Department of Education report entitled, *Principle Indicators of Student Academic Histories in Postsecondary Education 1972 to 2000* also indicates that students who enter college with prior college credits, on average, complete the degree requirements in a shorter amount of time than students who do not (Adelman, 2004). In fact, results of that particular report indicate that “for bachelor's degree recipients with no such acceleration credits, the average time-to-degree was 4.65 calendar years; for those with more than nine acceleration credits, the average time-to-degree was 4.25 calendar years” (Adelman). While this may seem intuitive, it is not always the case. Many students maintain part or full-time employment while in college and/or may have transfer courses that do not contribute to their specific degree plan, therefore, time-to-degree is not always reduced as a result of prior college credit. However, if time-to-degree was reduced, students would be able to minimize college expenses and enter the job market sooner. This certainly offers students some incentive, but we must question if early degree completion is really in the best interest of students.

Are college students who graduate and enter the workforce at 21 years of age mature enough and truly ready to do so?

A small amount of unique variance (1%) in first year college grade point average could be accounted for by prior college credits. While statistically, this amount of variance is significant, we must determine if one percent of variance above and beyond variance already accounted for is practically significant? Realistically, the answer is no. While there are indeed certain benefits to concurrent enrollment programs for those secondary students who chose to enroll in them, ultimately only a small amount of variance in first year college GPA can be accounted for by prior college credits. As previous research has indicated (Garton, Ball & Dyer, 2002) high school core GPA and ACT composite remain better predictors of first year college GPA.

Critics of concurrent enrollment question as to whether the courses taken by secondary students are truly equivalent to courses delivered on college campuses by college faculty. Is the content similar? Is the instruction consistent? These, and other questions, should be explored through future research.

Additionally, because of the assertion that participation in concurrent enrollment programs can reduce the time-to-degree completion, additional research should be conducted to determine whether or not that is true with this particular population. One consideration, which could be explored, is how prior college courses taken ultimately factor into students' degree programs? Are the courses truly utilized or are they simply elective courses? With the decreased number of credits now required for a baccalaureate degree, could the benefit and flexibility of prior college credits be limited?

To truly determine the worth and merit of concurrent enrollment programs, additional research must be conducted that addresses the outcomes, including college GPA, retention and graduation rate. Different types of concurrent enrollment programs could also be compared and evaluated for effectiveness. In addition, data from a number of institutions or multiple years of data from the same institution would provide enriched information regarding the importance and benefit of concurrent enrollment programs.

Literature Cited

- ACT. 2005. Many colleges could do more to help students stay in school (<http://www.act.org/activity/spring2005/colleges.html>). Activity 43(2). (May 25, 2006).
- Adelman, C. 2004. *Principal Indicators of Student Academic Histories in Postsecondary Education, 1972-2000*. Washington, DC: U.S. Dept. of Education, Institute of Education Sciences.
- Advisory Committee on Student Financial Assistance (ACCSFA). 2002. *Empty promises: The myth of*

- college access in America. (<http://www.ed.gov/about/bdscomm/list/acsfa/emptypromises.pdf>). (May 6, 2007).
- Andrews, H.A. 2001. The dual-credit explosion at Illinois' community colleges. *The Community College Jour. of Research and Practice* 28, 415-422.
- Andrews, H.A. 2004. Dual-credit research outcomes for students. *Community College Jour.* 71(3), 12-16.
- Carey, K. 2004. A matter of degrees: Improving graduation rates in four-year colleges and universities. Washington D.C.: The Education Trust.
- Delicath, T.A. 1999. The influence of dual credit programs on college students' integration and goal attainment. *Jour. of College Student Retention* 1(4), 377-398.
- Eimers, M.T. and R. Mullen. 2003. Dual credit and advanced placement: Do they help prepare students for success in college? In: *Proc. 43rd Annual AIR Fall Conference*, Tampa, Florida, May.
- Garton, B.L., A.L. Ball, and J.E. Dyer. 2002. The academic performance and retention of college of agriculture students. *Jour. of Agricultural Education* 43(1), 46-56.
- Greenberg, A.R. 1989. Concurrent enrollment programs: College credit for high school students. Bloomington, IL: Phi Delta Kappa Educational Foundation.
- Hopkins, W.G. 2002. New view of statistics: Effect magnitudes. (<http://www.sportsci.org/resource/stats/effectmag.html>). (June 25, 2007).
- Kaye, R.D., J. Lord, and G. Bottoms. 2006. Getting students ready for college and careers [Electronic version]. (http://www.sreb.org/main/goals/Publications/06E04-Students_Ready_College_Career.pdf). Challenge to Lead Series. (May 6, 2007).
- Kim, J., C. Kirby, and D. D. Bragg. 2006, May. Dual credit: Then and now. University of Illinois at Urbana-Champaign, Office of Community College Leadership and Research website (http://occr1.ed.uiuc.edu/Publications/In_Brief/index.asp). (April 17, 2007).
- McKeon, H.P. 2003. Controlling the price of college [Electronic version]. *The Chronicle Review* 49(44, p. B20).
- Pascarella, E.T. and P.T. Terenzini. 1991. How college affects students: Findings and insights from twenty years of research. San Francisco, CA: Jossey-Bass Publishers.
- Pascarella, E.T. and P.T. Terenzini. 2005. How college affects students: A third decade of research. San Francisco, CA: Jossey-Bass.
- Southern Regional Education Board. (2006). Getting students ready for college and careers. Atlanta, GA.
- Terenzini, P.T. and R.D. Reason. 2005. Parsing the first year of college: A conceptual framework for studying college impacts. In: *Proc. Annu. Mtg. of the Association for the Study of Higher Education*, Philadelphia, PA, November.
- United States Department of Education. n.d. Dual enrollment: Accelerating the transition to college. (<http://www.ed.gov/about/offices/list/ovae/pi/hsinit/papers/cte.pdf>). (April 10, 2007).
- United States Department of Education. 2004. Principle indicators of student academic histories in postsecondary education 1972-2000. (<http://www.ed.gov/rschstat/research/pubs/prinindicat/prinindicat.pdf>). (April 10, 2007)