

## Addressing the American Academic Achievement Gap

José E. Náñez, Sr.

Frank Gracia

School of Social and Behavioral Sciences  
Arizona State University  
4701 W. Thunderbird Road  
Glendale, Arizona 85306  
United States of America

### Abstract

---

*There is a wide academic achievement gap in the United States. Poor students are amassed on one side and those from higher socioeconomic status homes on the other. The latter tend to come from non-Hispanic White and Asian American ethnic backgrounds. The gap develops during the preK-12 years, continues as decreased high school graduation rates, and persists during the higher education years, resulting in under-enrollment, under-performance, extended time to graduation, and increased financial indebtedness among many students. Here, we discuss educational rigor, SES, and some of the other factors that, when lacking or in low supply, hinder higher education success especially among poor and minority students.*

---

**Keywords:** Academic lag, impeding factors, socioeconomic status, educational rigor

### 1. Introduction

The academic achievement gap can generally be defined as disparity in academic success between American students. The gap represents significant cause for concern and “is perhaps the most tragic of all chasms along the pathway to higher education” (AMEPAC, 2005, p. 7).

There is increasing evidence for existence of an academic achievement gap and recognition that it constitutes a significant educational barrier separating American children from poor homes and those from higher incomes homes. Some education research leaders admonish that the gap issue needs to be addressed with urgency. This concern is becoming common among U.S. educators and policy makers as well (see Nanez, 2010; Garcia and Nanez, 2011, for example). Leaders agree that collaborative efforts at the National, State, regional, and local levels are necessary to address the problem. However, this is much easier said than done. For example, while not a unique case, in the State of Arizona, which has a large and growing Hispanic population, “...80 percent of Black, 87 percent of Latino 4th graders cannot read at grade level; 84 percent of Black, 85 percent of Latino 4th graders cannot do math at grade level” (Hart and Hager, 2006, p. 9).

A recent National Center for Education Statistics (NCES) report (2015) shows that of students who enrolled in ninth grade, 80% graduated. While this is a historically high graduation percentage rate that may reduce the academic performance lag between American students overall relative to their peers from other highly educated nations, a deeper look reveals some disturbing underlying statistics. First, the graduation success rate is based on combined data for all high school students whose records are available; disaggregated data reveal the hidden fact that academic success in America is much lower for poor and minority students than for non-Hispanic White and Asian American students from more financially affluent homes. Also concealed is the fact that according to the Office of the National Assessment of Educational Progress (NAEP), American students overall are not exhibiting high success in proficiency levels for core courses such as mathematics and reading (NAEP, 2013). The problems in Arizona and other States with increasing poor and minority populations persist. Today, almost a decade after Hart and Hager (2006) published their findings, it remains clear that the academic success gap continues to plague American educational attainment.

## 2. Causes of the Academic Achievement Gap

As stated above, close examination shows that the existence of the academic achievement gap is clearly established. Research should now focus on searching for explanations concerning the causes of the gap, identifying research-based methodology, and implementation of promising educational approaches and practices.

A broad sociopolitical perspective has resulted in the general perception that the academic achievement gap is attributable mainly to our educational system's "failure" to adequately prepare American students for academic success. Like the NCES (2015) report, an examination of university graduation rates shows some improvement there as well. However, looking at the trends over time reveals that this is only true for students from the highest two family income quartiles. Graduation rates have not improved for poor students in the nearly five decades represented in the data. (Kelly, Schneider & Carey, 2010; Reardon, 2011, Pell Institute, 2013).

A "logical" conclusion that U.S. education should be blamed for these disappointing educational outcomes may be drawn from such data. However, the picture is much more complex in nature. Specifically, because the students most affected tend to come from low SES and ethnic minority families, it is not appropriate to place the blame entirely on the shortfalls of the educational system.

A more appropriate interpretation shows that the gap is associated with a complex social-cultural-educational systems interaction. For example, according to statistics from the Consumer Financial Protection Bureau, poor education and low SES combine to produce increased time to university graduation from the traditional four years to six years, which results in increased indebtedness. (Denhart, 2013) The Denhart report specifies that federal student loan indebtedness to finance education-related expenses has reached an unprecedented 1.2 trillion dollars. Students use other sources as well to pay for university-related expenses, making the actual debt much greater (Chopra, 2013).

Much of the debt will not be recovered. For example, in a Los Angeles Times report, Carla Rivera cites data showing that many students drop out before completing a four year degree, costing tax payers at the federal and state levels billions of dollars. "Nationally, about 30% of first-year students fail to return to campus for a second year." (2010)The longer students take to graduate the greater indebtedness will become. A report by Complete College America, (2011) notes that while "... full-time students take 4.7 years to graduation, part-time students take 5.6 years." (2011, p. 12)The number of credit hours to bachelor's degree completion has increased to 134 compared for the 120 expected for such degrees. (Complete College America, 2014)

Research shows that delayed time to graduation is especially evident among Hispanics and African Americans. Of these students, 46.5% and 39.9% respectively, take six years to graduate. (Complete College America, 2011). However, the problem is common among all students combined. Only 27% of students twenty five years of age and older at time of college enrollment complete a bachelor's degree in six years and the percentage of poor, Pell Grant students, who graduate in six years is 45.2%. (Complete College America, 2011) "Far too many college students get lost in the process, slowed down by unclear expectations, numerous obstacles, and having no clear pathway to graduation day" (Complete College America, 2014, pg. 8).

Increased time to bachelor's degree attainment and increased financial indebtedness, two important SES-based factors interact. Their joint impact is correlated with poor performance by some American schools in preparing students for higher education success. For example, high school graduation rates among Hispanics is approximately 50 percent overall and only one quarter of high school graduates complete a bachelor's degree (Complete College America). This is also true for other U.S. minorities. "Students of color are still more likely to attend schools where on-time graduation is not the norm; ...schools where the graduation crisis is concentrated produce roughly half of the African American and Hispanic dropouts. Although the graduation rate has risen to 78.2 percent, rates for African American, Hispanic, and low-income students still lag significantly behind at 66.1 and 71.4 percent respectively. Of those students who do graduate on time, only about one-third leave high school prepared for the academic rigors of college without needing remedial coursework." (Balfanz and Stewart, 2014, pg. 4).

Thus, ethnic minority status produces a combined additive effect with low SES and low quality education. Further, it is likely that the impact of such factors is associated with difficulties involving lack of engagement (low academic and social acculturation) within the university academic and student life environments, which are correlated with high dropout rates, especially among poor and minority students.

“Low-income and first-generation students are less likely to be engaged in the academic and social experiences that foster success in college (often referred to as academic and social integration)” (Engle and Pinto, 2008, p. 21)).

In sum, successfully addressing the variables contributing to the academic achievement gap will allow poor and minority students to claim their fair share of the higher education dream and the economic benefits associated with its attainment. Failure to do so will have a negative impact on U.S. economics. This possibility is predicted in a report by the Georgetown University Center on Education and the Workforce cited by Smith (2012), “...by 2018, 68 percent of jobs will require postsecondary education, which is a 40 percent increase over the current level” “low- persistence and graduation rates, especially among low-income young adults and minorities, are ongoing problems that U.S. higher education faces.” (p. 105). Other researchers (e.g., Nanez, 2010; Garcia and Nanez, 2011) also support this view.

### **3. Key Impeding Factors to Academic Success**

We have seen that factors that contribute to academic lag are numerous and interact in complex ways to form the academic gap. In the following sections we conduct a deeper examination of some of the most significant factors and gain an understanding of their contribution to academic underachievement.

#### **3.1 Socioeconomic Status**

We expand the discussion on SES here to show that there is considerable evidence that growing up in a low SES environment is strongly related with low academic achievement. Concern over this issue is accumulating, as shown in the following comment from the Southern Education Foundation, “Within the next few years, it is likely that low income students will become a majority of all public school children in the United States. With huge, stubbornly unchanging gaps in learning, schools in the South and across the nation face the real danger of becoming entrenched, inadequately funded educational systems that enlarge the division in America between haves and have-nots and endanger the entire nation’s prospects...” (2013, p. 13)

Harris (2006) notes that low-SES-related factors interact to produce poor educational outcomes. “Poor nutrition and illness cause students (a) to miss school more often and (b) to be less prepared to learn when they attend.<sup>4</sup> Within the disadvantaged home, parents often have relationships with their children that are, emotionally and physically, less healthy. These unhealthy relationships are reinforced in part by economic pressures that induce conflicts between parents and children<sup>6</sup> The combination of these factors and other effects is shown to be worse as students remain in poverty for longer periods of time.<sup>7</sup>” (pg. 1).

According to Harris (2006) addressing low SES issues can alleviate “educational inequity” (pg. 2) A “...low-poverty-low minority school is 89 times more likely to be high performing than one that is high-poverty-high-minority” (p. 25).

Factors such as those cited by Harris (2006) interact and become strongly associated with academic underachievement to produce a cumulatively negative impact on educational success among students from minority and poor families, when it comes time for them to enroll in higher education. For example, longitudinal data show that from 1970 to 2004 family income was a significant SES factor in determining college and university students’ retention to graduation rates by age 24 years (Mortenson, 2006). Data since 2005 show that the earlier trends for graduation rates by age 24 years have remained consistent: 71.2, 30.4, 14.6, and 10.4 among the four family income quartiles from high to low respectively. Kyle Whitman (personal communication, 2013) put these findings in the following context “...71.2% of all children in families in the top family income quartile (earning more than \$104,750 in annual income in 2011), attain a bachelor’s degree by age 24, while only 10.4% of their peers in families in the lowest family income quartile (earning less than \$33,283 in 2011) do. While the national college attainment rate has increased in the past four decades, according to this data, almost all progress is attributable to increased educational attainment among students from the wealthiest families. From 1970 to 2011, the college attainment rate for students in the highest family income quartile grew from 40.2% to 71.2%, an increase of 31.0 percentage points. During the same period, the college attainment rate for students in the lowest family income quartile increased from 6.2% to 10.4%, a change of only 4.2 percentage points”. (Postsecondary Education Opportunity, 2013, pg.1). Recent Pell Institute data show that university bachelor’s graduation rates by age 24 were 77%, 34%, 17%, and 9% for students from the highest to the lowest income quartiles respectively (2013).

In sum, these statistics point to significant barriers to educational success for students from the lowest two family income quartiles. Specifically, for these students, graduation with a bachelor's degree by age 24 years remained flat in the roughly four decades from 1970 through 2013.

### **3.2 Academic Rigor and Educational Success**

While low family income and its resulting poverty have historically correlated in a negative fashion with low enrollment and graduation rates, especially among minority students, enrollment in academically rigorous courses in high school appears to temper the negative effects of poverty (Burney & Beilke, 2008). According to Adelman (1996; 2006), students who are more likely to complete a higher education degree are those that completed "...mathematics courses beyond Algebra II and rigorous courses such as Advanced Placement during high school. Specifically, successful completion of a course in trigonometry or precalculus more than doubled the odds that a student with that level of mathematical preparation who entered college would eventually graduate." These researchers report that in their study, enrollment in courses containing academic rigor outweighed the impact of SES. However, they acknowledge that poor households are less likely than higher income households to provide the type educational environments that encourage students to enroll in courses containing academic rigor. In a U.S. Department of Education report, titled "Science, Technology, Engineering and Math: Education of Global Leadership", President Barack Obama is quoted as saying: "[Science]" [Science] is more than a school subject, or the periodic table, or the properties of waves. It is an approach to the world, a critical way to understand and explore and engage with the world and then have the capacity to change that world..." "Yet today, few American students pursue expertise in STEM fields-and we have an inadequate pipeline of teachers skilled in those subjects." (online report, no page number provided).

Students from poor homes are less likely to come from good schools that provide them with academic rigor. "In regard to the factor of opportunity, schools with a higher minority and low-income student population are less likely to offer rigorous curricula and Advanced Placement courses (Martin, Karabel, & Vasquez, 2005). ...Students from low-income, Black, Hispanic, or Native American groups are under identified and underrepresented in rigorous coursework of any kind. High-achieving Latino students under enroll in selective programs for which they are qualified (Fry, 2004). ...Few children from high-poverty schools get the education needed in their early years that would prepare them for the advanced curriculum they will need for college preparation" (p. 179).

Data show that a disparity has long existed among American students' enrollment in STEM, chemistry and other academically rigorous courses. For example, there is "...data that show significant gaps in mathematics achievement that have not closed considerably over the last three decades. By eighth-grade, 91% of African-American and 87% of Latino students are not proficient in mathematics, as measured by the National Assessment of Educational Progress (NAEP). This stands in stark contrast to the lower proportions of Asian American (53%) and White (63%) students who are not proficient (Haycock, 2006). In fact, 12th grade Latino and African American students perform as well as 8th grade White students on NAEP's mathematics assessment" (Flores, 2007, pg. 30). Cole & Espinoza, (2008) cite National Science Foundation (2006) data showing that "...of the 436,372 bachelor's degrees awarded in science and engineering to U.S. citizens and permanent residents, 7.3% (about 31,855) were earned by Latino students, whereas 65.1% (about 284,078) were earned by White, non-Hispanic students." (p. 285) Further there are gender differences in Latino attainment of degrees in STEM fields. While Latinas outnumber Latinos among the university ranks, "Latinas are underrepresented in the STEM fields. In 2005 Latinas received 60% of the bachelor's degrees awarded to the Latino population, but Latinas only earned 37% of the degrees awarded to this population in STEM fields" (National Center for Education Statistics, 2005, pg. 285).

Engaging poor and minority students in courses containing academic rigor prior to university enrollment, while a step in the right direction, is not a sufficient remedy to improve their low academic success. For example Whitman, (2013) projected that graduation rates among poor students are still expected to be significantly lower than among their peers from higher income homes.

"Of students who took at least Algebra II in high school and enrolled in a two or four year college within two years of high school graduation, 31% of low income students and 73% of high income students in the high school class of 2004 were projected to earn a bachelor's degree by 2012." (Whitman, 2013)

### **3.3 Ethnicity and the Academic Gap**

Unquestionably, academic rigor and SES are important contributors to the academic gap. However, ethnicity is also part of the academic gap equation. The NAEP (2013) report cited above shows that proficiency rates in mathematics were 26% (overall), 7% (African Americans), and 12% (Hispanics). Similar results were reported for reading: 38% (overall), 16% (African Americans) and 23% (Hispanics) (NAEP, 2013). Besides showing that American high school students lag globally in core course proficiency, it also shows that there is an academic performance gap among American students.

### **4. Other Contributing Factors**

There are other factors besides academic rigor and SES that correlate with low academic performance. The list includes, but not limited to: lack of financial support, failure to address inequality of resources, lack of information, high dropout rates, lack of educational tracking, lack of successful academic role models, and lack of or low family involvement in students' academic lives. Several of these factors are discussed below.

#### **4.1 University Enrollment and Persistence**

Enrollment and persistence to graduation among minority high school students is not impressive and their representation in the higher education ranks is generally considerably less than would be expected from their population percentages. Interestingly, in the State of Arizona, African Americans have been found to be slightly "over represented" in university enrollment relative to their percentage of the State population. Although a definitive reason(s) for this situation is/are not clear, a contributing factor may be that the largest public university in Arizona enrolls students in the top 50% of their high school graduating class. This inclusiveness effort on the part of the university may be perceived by African American students as an enhanced opportunity to enroll in higher education. Perhaps other universities should consider applying this approach to their recruitment and enrollment practices.

Of course, with reference to the above note, once universities get these students enrolled, all efforts to ensure their academic success and acculturation to the university should be put in place. There are some promising processes for accomplishing this with first-generation-university-going, poor, minority, and other under-represented students. For instance, "...for Latino students, research has suggested that once in college, factors such as peer and faculty support, and co-curricular involvement play a role in the retention of this student population (Gloria, Castellanos, Lopez, & Rosales, 2005; Hernandez, 2000; Hernandez & Lopez, 2004). Faculty or staff members, in particular, serve as role models and examples of individuals who have successfully navigated the educational system. Moreover, students who foster relationships with faculty members outside of the classroom are more likely to report higher levels of college satisfaction and persist to graduation (Hernandez & Lopez). Through co-curricular involvement, Latino students find opportunities to make new friends who are from similar cultural and socioeconomic backgrounds; it is through these peer relationships that they typically find a caring and supportive educational community" (pg. 287). Moreover, "similarly, available research on students majoring in STEM has also reported that supportive educational environments during college were positive indicators of persistence (Bonous-Hammarth, 2000; Grandy, 1998; Leslie, McClure, & Oaxaca, 1998)." There is reason to believe that such experiences with positive educational, cultural and social support systems can foster academic success for all students. Efforts such as those cited next show potential to increase retention rates especially among poor and minority students. "For racial/ethnic minority (REM) students in particular, such support includes minority or female role models and advisors, advice from advanced students from the same ethnic group, and minority relations staff (Grandy). Whereas Bonous-Hammarth emphasized the importance of connections among peers and mentors, Leslie et al. found that REM students who complete their science and engineering degree typically emphasize the role of a faculty member as instrumental to their success" (Cole and Espinoza, 2008, p. 187). Support for this hypothesis comes from data showing that when considering multiple environmental factors that contribute academic success, "...out of the 10 variables in the three environmental categories, the only significant variables were: studied with other students, attending diversity functions, time spent on studying/homework, and faculty support and Encouragement" (pg. 294).

#### **4.2 Building Social Capital**

Data presented above demonstrate that building strong social networks within the university community constitutes positive ways to address academic lag in America associated with income inequalities, minority group status and other related factors.

In addition, it is important for K-12 schools and universities to implement methods that provide adequate funding and increased access to better schools that provide rigorous academic programs and highly trained teaching professionals. It is also becoming evident that students benefit significantly when provided with the opportunity to participate in academic enrichment through mentoring. There is a considerable literature on the positive effects of individual and group mentoring on academic success, especially among poor and minority students. Unfortunately space limitations do not allow us to engage an adequate discussion of the effects of mentoring and academic success in this paper. (For examples of effective mentoring programs, see Girves et al., [2005]; [Nanez, Gracia, & Jackson, 2012]; [Nanez, Gracia, Barajas & Cabrera, 2014]).

## 5. Conclusion

To conclude, numerous educational, socioeconomic, and demographic factors discussed in this paper interact to impact academic success. The educational gap in America is translating into a gap between America and other highly educated nations.

Eliminating the academic achievement gap is not only the right thing to do from the sociocultural perspective of providing fairness and creating parity in educational opportunity and achievement for all American students. It will also contribute significantly to the continued economic well-being of America. Alan Greenspan, former U.S. Chairman of the Federal Reserve notes several possible consequences of low-quality education: “An inefficient education system is failing to produce a skilled workforce sufficiently large to meet the increasing technological needs of America. Second, the earning power gap between well-educated (skilled) workers and low-education, unskilled workers will continue to grow in America. Third, as technology increases and the number of educated, skilled worker decreases or fails to grow, America is forced to increase its immigration numbers among educated, skilled immigrant workers.” Greenspan warns: “A dysfunctional U.S. elementary and secondary education system has failed to prepare our students sufficiently rapidly to prevent a shortage of skilled workers and a surfeit of lesser-skilled ones, expanding the pay gap between the two groups. Unless America’s education system can raise skill levels as quickly as technology requires, skilled workers will continue to earn greater wage increases, leading to ever more disturbing extremes of income concentration. As I’ve noted, education reform will take years, and we need to address increasing income inequality now. We can immediately both damp skilled-worker income and enhance the skill level of our workforce by opening our borders to large number of immigrants with the vital skills our economy needs. Adaptation is our nature, a fact that leads me to be deeply optimistic about our future.” (2007, p. 76) In their recent book, Garcia and Nanez (2011) echo warnings by Greenspan and other economic and education experts regarding the potential economic down turn of failure to address the academic achievement gap. Garcia and Nanez also point to the fact that many academically underachieving students come from recent immigrant homes where English is not the first language. It is important that the unique educational needs of these students be met, in order for them to achieve educational success and become productive members of our society. Success in addressing such factors, will produce Americans equipped with the educational skills to eliminate the academic gap between richer and poorer citizens. This will restore America’s ranking as the education leader globally. Making this a reality will ensure that America will continue to produce the highly educated workforce necessary to meet the increasingly technical internal and global employment demands.

## References

- Adelman, H. S. (1995). Clinical psychology: Beyond psychopathology and clinical interventions. *Clinical Psychology: Science and Practice*, 2(1), 28-44.
- Adelman, C. (2006). The Toolbox Revisited: Paths to Degree Completion From High School Through College. *US Department of Education*.
- Advisory Committee on Student Financial Assistance, Washington, DC, Ficklen, E., Stone, J. E., & Advisory Committee on Student Financial Assistance, Washington, DC. (2002). *Empty promises* Distributed by ERIC Clearinghouse.
- Arnold Mitchum & Tom Mortenson. (2015). Indicators of higher education equity in the united states The Pell Institute.
- Balfanz, R., & Stewart, S. (2014). Solving the High School Graduation Crisis: Identifying and Using School Feeder Patterns in Your Community. Alexandria, Virginia: United Way Worldwide.
- Burney, V. H., & Beilke, J. R. (2008). The constraints of poverty on high achievement. *Journal for the Education of the Gifted*, 31(3), 171-197.
- Bonous-Hammarth, M. (2000). Pathways to success: Affirming opportunities for science, mathematics, and engineering majors. *Journal of Negro Education*, 92-111.

- Cole, D., & Espinoza, A. (2008). Examining the academic success of latino students in science technology engineering and mathematics (STEM) majors. *Journal of College Student Development*, 49(4), 285-300.
- Denhart, C. (2013). How the \$1.2 trillion college debt crisis is crippling students, parents, and the economy. *Forbes Magazine*,
- Dodson, J. (2009). "Take the fifth": Mentoring students whose cultural communities were not historically structured into U.S. higher education. *Innovative Higher Education*, 34(3), 185.
- Engle. (2008). Moving beyond access: College success for low-income, first-generation students. Pell Institute for the Study of Opportunity in Higher Education,
- Flores, A. (2007). Examining Disparities in Mathematics Education: Achievement Gap or Opportunity Gap? *The High School Journal*, 29-42.
- Forester, C. A., & Drake, T. M. (2005). Minority student report 2005: A snapshot of arizona's educational achievement. Arizona Commission for Postsecondary Education,
- Fry, R. (2004). Latino youth finishing college: The role of selective pathways. Pew Hispanic Center,
- García, E. E. (2011). Language and cognitive development. Bilingualism and cognition : Informing research, pedagogy, and policy (pp. 19; 19-38; 38) American Psychological Association.
- García, Eugene E. Náñez, José E., Sr., (2011). Bilingualism and cognition: Informing research, pedagogy, and policy., (pp. 19-38). Washington, DC, US: American Psychological Association, vi, 242 pp.
- Grandy, J. (1998). Persistence in science of high-ability minority students: Results of a longitudinal study. *Journal of Higher Education*, 589-620.
- Greenspan, A. (2007). *The age of turbulence: Adventures in the new world*. New York, NY: Penguin Press.
- Gloria, A. M., Castellanos, J., Lopez, A. G., & Rosales, R. (2005). An examination of academic nonpersistence decisions of Latino undergraduates. *Hispanic Journal of Behavioral Sciences*, 27(2), 202-223.
- Girves, J. E., Zepeda, Y., & Gwathmey, J. K. (2005). Mentoring in a post-affirmative action world. *Journal of Social Issues*, 61(3), 449-479.
- Hart, W., Hager, C. J. E., & Morrison Institute for Public Policy. (2012). *Dropped?*. Phoenix, Ariz.: Morrison Institute for Public Policy, Arizona State University.
- Harris, D. N. (2006). Ending the blame game on educational inequity: A study of "high flying" schools and NCLB. Education Policy Research Unit,
- Hernandez, J. C. (2000). Understanding the retention of Latino college students. *Journal of College Student Development*.
- Hernandez, J. C., & Lopez, M. A. (2004). Leaking pipeline: Issues impacting Latino/a college student retention. *Journal of College Student Retention: Research, Theory & Practice*, 6(1), 37-60.
- Kelly, A. P., Schneider, M., & Carey, K. (2010). Rising to the challenge: Hispanic college graduation rates as a national priority. American Enterprise Institute for Public Policy Research,
- Leslie, Larry L., Gregory T. McClure, and Ronald L. Oaxaca. "Women and minorities in science and engineering: A life sequence analysis." *Journal of Higher Education* (1998): 239-276.
- Mitchum, A & Mortenson T. (2015). Indicators of higher education equity in the united states
- Mortenson, T. (2006, May). *Inherited opportunity for higher education*. Paper presented at the Association for Institutional Research, Chicago.
- Náñez, J., Gracia, F., Barajas, M., & Cabrera, S. (2014, October 1). Summer Collegiate Experience for University Preparation Among High School Students. Paper presented at Engagement Scholarship Conference in University of Alberta, Alberta , Canada.
- Náñez, J.E., Sr., Gracia, F., Jackson, S., Bracamontes, E., & Candia, M. *Arizona State University Mentoring Program: Designing a Sustainable Research-Supported Pre-Collegiate Program*. 13<sup>th</sup> annual National Outreach Scholarship Conference. University of Alabama, Tuscaloosa, AL. October, 2012.
- Perna, L. W. (2005). A gap in the literature: The influence of the design, operations, and marketing of student aid programs on college-going plans and behaviors *Journal of Student Financial Aid*, 35, 7-15.
- Smith, V.C. (2012), Scaling Up: Four Ideas to Increase College Competition, in *Game Changer*. Edited by Oblinger, D.
- The Four Year Myth. (2014). *Complete College America*, 1-86. Retrieved from <http://completecollege.org/wp-content/uploads/2014/11/4-Year-Myth.pdf>
- Thomas, S., Tan, A., & Hoffman, C. (2006). National Center for Education Statistics 2005 (p. 285).
- Venezia, A., Kirst, M. W., & Antonio, A. L. (2003). *Betraying the college dream : How disconnected K-12 and postsecondary education systems undermine student aspirations*. Washington, DC: U.S. Dept. of Education.