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The Productivity Trend for K-12 Public Schools is Even Worse

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Richard Vedder has had a long and distinguished career as an economic historian who has analyzed a wide variety of public policy issues. Since the mid-1960s, Dr. Vedder has made important contributions to our understanding of labor mobility within and between nations, slavery, unemployment, state-level economic growth, and labor market policy. His analyses have been timely, interesting, and relevant for national and state public policy discussions. Over the past decade, Dr. Vedder has become famous—or infamous—in academic, policy, and media circles for his work on productivity in higher education. What is less well known is that Dr. Vedder got his start in the economics of education with his analysis of changes over time in productivity in American public K-12 education.

This paper reminds readers of Dr. Vedder’s contribution to our knowledge of the productivity problem in American public K-12 education, updates his findings with more recent data, shows that the productivity problem in K-12 public education is worse than Dr. Vedder suggests is the case for higher education, and considers a solution Dr. Vedder proposed to ameliorate the K-12 productivity problem—parental choice combined with converting individual public schools into autonomous and employee-owned enterprises.

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Richard Vedder, From Economic Historian to Economics of Education Researcher

For about the first four decades of his career, Richard Vedder was well known among economists for his policy-relevant research on a wide variety of economic history topics—collectively, his economic history papers were cited hundreds of times. However, for the past decade, Dr. Vedder has become very well known for his research on higher education productivity. If one thinks of productivity as outputs divided by inputs, Dr. Vedder has been concerned about both sides of the higher education productivity fraction line—concerned about higher costs and concerned about stagnant or perhaps declining outputs. His 2004 book *Going Broke by Degree: Why College Costs So Much* created a national stir and moved policy discussions towards questions of how to increase productivity in higher education. The Center for College Affordability & Productivity, which Dr. Vedder founded and directs, has produced a voluminous amount of research on productivity issues in higher education since its creation in 2006.

Evidence that he is a “player” in higher education policy includes the number of pieces in the *Chronicle of Higher Education* that contain the phrase “Richard Vedder”. Of the 237 *Chronicle* pieces that contain “Richard Vedder”, 236 have been since 2005. Beginning with his April 20, 2005 mention, Dr. Vedder has averaged slightly more than one appearance in the *Chronicle* every three weeks. As a point of reference, despite writing several popular and important books on higher education and being involved in higher education policy discussions since the early 1970s, two-time Harvard University President Derek Bok (1971-1991 and 2006-2007) appears a “mere” 193 times in the *Chronicle* during his much longer career in the higher education policy arena.¹

While Dr. Vedder’s research and views on higher education productivity are very well-known in academic, media, and policy circles, many do not know that his first foray into analyzing education policy was on the issue of productivity in American public *K-12* education. To my knowledge, his earliest piece on productivity in *K-12* education was in 1996. His report,

¹ In early October 2014, I searched www.chronicle.com for “Richard Vedder”. I repeated the exercise for “Derek Bok”. The *Chronicle of Higher Education* is the leading news and commentary publication for higher education administrators and professors.

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for the Center for the Study of American Business at Washington University, was entitled “School Daze: Productivity Decline and Lackluster Performance in U.S. Education”.

Since 1837, when Horace Mann became secretary of the Massachusetts State Board of Education, there have been nonstop and widespread calls for more funding and staffing for American public schools. To state that these calls have been successful would be an understatement. Vedder (1996) showed there have been tremendous increases in public school staffing from 1950 to 1993. Using data from the National Center for Education Statistics, he found that in 1950 there were just over five full-time equivalent (FTE) public school employees per 100 students. By 1993, there were more than 11 FTE school employees per 100 students.

What was the composition of the more than doubling of public school staffing over these two generations? Dr. Vedder showed that this staffing surge was disproportionately due to increases in employment of those who were not lead teachers. He wrote “While the number of administrators per pupil rose about 50 percent, the big increase was in support staff and in quasi-instructional staff (e.g. teacher aides, guidance counselors)” (Vedder, 1996: pgs.4-5).

Using student test results from the National Assessment of Educational Progress and the Scholastic Aptitude Test, Vedder (1996) shows that the output of K-12 public schools—average student performance on standardized exams—either decreased very slightly (1971 to 1992) or increased by about 2 percent (1978 to 1992) during the time period under study. However, this stagnant or slightly higher output occurred at the same time as a rather dramatic increase in real public school spending and staffing.

The rest of this paper updates and provides more context for Vedder (1996), compares the productivity problems in K-12 education to Dr. Vedder’s findings for higher education, and uses Vedder (2000) and Vedder and Hall (2000) to consider a new direction for the delivery of K-12 education its benefits for teachers and other public school employees.

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The Modern Staffing Surge in K-12 Public Education²

According to data available from the U.S. Department of Education's National Center for Education Statistics, between fiscal year (FY) 1950 and FY 2009 the number of K-12 public school students in the United States increased 96 percent, while the number of full-time equivalent (FTE) school employees increased 386 percent (see Figure 1). American public schools hired personnel at a rate four times faster than their growth in students over that period. However, the numbers above obscure important information regarding the nature of the long-term and dramatic increases in staffing. I place public school employees into two categories—lead teachers and “other” staff (administrators, teacher aides, counselors, cafeteria workers, bus drivers, etc.). Between 1950 and 2009, teaching personnel grew by 252 percent while administrators' and other staff numbers increased 702 percent. Put differently, the rise in “other” staff was more than seven times faster than the increase in students.

Given that public school personnel increased at a much faster rate than students, staffing ratios declined significantly between 1950 and 2009. Figures 2 and 3 show those declines.

Between 1950 and 2009, the pupil-staff ratio declined to 7.8 students per public school employee from 19.3 students per public school employee. By 2009, there were fewer than eight public school students per adult employed in the public school system. The drop in the pupil-teacher ratio also was large—the pupil-teacher ratio was 27.5 students per teacher in 1950 and only 15.3 in 2009.

These trends also continued over the past generation. As shown in Figure 4, between FY 1992 and FY 2009, the number of K-12 public school students in the United States increased by 17 percent while the number of FTE school employees increased by 39 percent. Teachers saw a 32 percent rate of growth while administrators and other staff experienced a 46 percent rise.

That upsurge in non-teaching personnel was 2.3 times greater than the increase in students over that 18-year period. For teachers, growth was almost twice as large as the increase in students.

² This section borrows heavily from Scafidi (2012b; 2013).

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In the mid-1990s, Dr. Vedder was not the only one warning about too much central administration in K-12 public schools. The following quote on bureaucracy in American public education is notable because it comes from well-known advocates for public schools—David Berliner and Bruce Biddle—whose book, *The Manufactured Crisis: Myths, Fraud, and the Attack on America’s Public Schools*, provides a stirring defense of the public school system. Berliner and Biddle (1995) stated,

“But, even at their best, bureaucracies tend to force *their* definitions of ‘reality’ on people, in and out of the system; and this is pernicious in large districts where the philistine values of central administrators are allowed to defeat the educational commitments of teachers and principals. At their worst, educational bureaucracies become endlessly expanding financial sinkholes that eat up resources and create only mischief and red tape.”

Berliner and Biddle (1995, p. XX)

It is important to note that they wrote, “At their worst, educational bureaucracies become endlessly expanding financial sinkholes that eat up resources and create only mischief and red tape” based on the time period *before* the significant increase in administration and other non-teaching personnel depicted in Figure 4. If Berliner and Biddle thought teachers, principals, parents, and taxpayers were burdened by too much “bureaucratization” in 1995, what would they think now that the bureaucracy has become significantly larger?

Did No Child Left Behind Make Us Do It?

The short answer is “no.” The expansion in public school staffing between FY 1992 and FY 2009—including the relatively large increase in non-teaching personnel—cannot be blamed on the federal No Child Left Behind (NCLB) law.

During the pre-NCLB period, FY 1992 to FY 2001, public schools saw their student populations grow 13 percent. Meanwhile, school personnel numbers increased 29 percent. Teachers’ numbers rose 23 percent, about 1.75 times the increase in students; administrators and other staff experienced a 37 percent rise—almost three times the increase in students.

Although the largest staffing surges occurred pre-NCLB, personnel growth also outpaced student growth during the NCLB era.

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From the school year in which NCLB was passed (FY 2002) until FY 2009, the number of students rose 3 percent while the number of public school teachers and administrators increased at about the same rate, 7 percent. The primary difference between the NCLB era and the prior time period is that the trend toward increasing non-teaching staff at a greater rate than teachers was halted; in the NCLB era, teachers and non-teaching staff both increased at the same rate, which was more than twice as fast as the increase in students. In both the NCLB and the pre-NCLB eras under study, overall staffing in public education increased about 2.3 times faster than student growth.

Comparing Staffing in U.S. Public Schools to Publicly Funded Schools in the OECD

The Organisation for Economic Co-operation and Development (OECD) collects information on a wide variety of economic and social statistics on member nations, including staffing in publicly funded schools in the U.S. and the other 33 OECD nations. According to the OECD, publicly funded schools in OECD nations devote, on average, 63.8 percent of their operating budgets on salaries and benefits for teachers (see Figure 5). U.S. public schools, meanwhile, spend just 54.8 percent of their operating funds on teachers. That begs the question: Where do U.S. public schools spend the rest?

American public schools disproportionately spend their operating budgets on non-teaching staff relative to other nations. Whereas OECD nations' publicly funded schools spend an average of 14.9 percent of their operating budgets on non-teaching staff, American public schools spend 26.1 percent of their budgets on administrators, support staff, clerical staff, etc. (see Figure 6).

Compared to OECD nations, American public schools spend disproportionately more of their budgets on non-teaching staff and less on teachers. And, there is no evidence the disproportionate staffing of non-teachers in American public schools leads to higher student achievement.³

³ Different countries may count some school personnel such as bus drivers as "other" instead of counting them as non-teaching personnel. However, even if the United States is more likely than other OECD nations to count bus drivers and other support personnel as "other", the implication is the same—the U.S. spends significantly more operating spending on non-teaching personnel because the percentage of U.S. public school operating budgets devoted to the "other" category is only one half of one percentage point different than the OECD average

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In 2009, a sample of K-12 students from each of the 34 OECD nations, and 31 other nations and provinces, were given international exams called the *Programme for International Student Assessment* (PISA). The U.S. Department of Education's summary of American students' achievement in math relative to other countries on the PISA exam is as follows:

“Among the 33 other OECD countries, 17 countries had higher average scores than the United States, 5 had lower average scores, and 11 had average scores not measurably different from the U.S. average. Among the 64 other OECD countries, non-OECD countries, and other education systems, 23 had higher average scores than the United States, 29 had lower average scores, and 12 had average scores not measurably different from the U.S. average score.” (U.S. Department of Education, 2011)

In our globalized world, low or mediocre student achievement will harm Americans in the labor market. In particular, many studies have shown achievement in mathematics to be an important predictor of future labor market productivity and earnings (see, for example, Johnson and Neal (1998)). Although mathematics achievement in the U.S. is not at the top in international comparisons, America's education spending per student is. Only two out of 31 OECD countries spend more per student on elementary and secondary public school students than the U.S. (U.S. Department of Education, 2010). Further, higher scores on those international exams seem to be associated with higher levels of national economic output. (Hanushek and Woessman, 2010)

Even though the U.S. spends more money per student relative to almost all other nations, it does not have higher student achievement.

Although Staffing in U.S. Public Schools Dramatically Increased, Student Achievement Did Not

Given U.S. public schools' massive increase in staffing and larger proportion of spending on administrative and other non-teaching staff relative to other countries, an important question about the wisdom of that policy presents itself: Is there evidence that increases in public school staffing and disproportionate spending on non-teaching personnel improved student achievement in the United States?

(Education at a Glance 2010: OECD Indicators, Table B62b. Organization for Economic Cooperation and Development, Paris.).

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After three decades of decline, America's public high school graduation rate has increased slightly over the past generation. Using the most accurate measure of the on-time public high school graduation rate, the National Center for Education Statistics reports the public high school graduation rate increased to 74.7 percent from 74.2 percent between FY 1992 and FY 2008.⁴ However, the public high school graduation rate in 2008 remained slightly below where it was four decades earlier.

Two pieces of research are worth consulting on this topic. First, in the abstract to their 2010 paper, which endeavored to get accurate estimates of public high school graduation rates over time, Nobel laureate James Heckman and his co-author, Paul LaFontaine, wrote:

“This paper uses multiple data sources and a unified methodology to estimate the trends and levels of the U.S. high school graduation rate. Correcting for important biases that plague previous calculations, we establish that (a) the true high school graduation rate is substantially lower than the official rate issued by the National Center for Educational (sic) Statistics; (b) it has been declining over the past 40 years; (c) majority/minority graduation rate differentials are substantial and have not converged over the past 35 years; (d) the decline in high school graduation rates occurs among native populations and is not solely a consequence of increasing proportions of immigrants and minorities in American society; (e) the decline in high school graduation explains part of the recent slowdown in college attendance; and (f) the pattern of the decline of high school graduation rates by gender helps to explain the recent increase in male-female college attendance gaps.” (Heckman and LaFontaine, 2010: pg. 244)

Heckman and LaFontaine report that the percentage earning high school diplomas in recent years was below the percentage receiving diplomas in 1970. Since 1970, the financial returns in the labor market have declined in relative terms for high school dropouts. By itself, the decline in economic fortunes for high school graduates should have led to an increase in the public high school graduation rate. That public high school graduation rates actually have fallen even when the incentive for students to graduate has risen is a startling finding.

⁴ This information on public high school graduation rates comes from Table 112 of the 2010 Digest of Education Statistics and Table 101 of the 2006 Digest of Education Statistics, both from the National Center for Education Statistics at the U.S. Department of Education.

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The National Assessment of Educational Progress (NAEP) is a series of exams on various subjects given to samples of students ages nine, 13, and 17.

As shown in Figure 7, scores on the NAEP Long-Term Trend Assessment have not increased during the time period under study when public school staffing ballooned.⁵ Between 1992 and 2008, NAEP reading scores fell slightly while scores in mathematics were flat.

In sum, there is no evidence student achievement in American public schools improved when there were large increases in staffing. Thus, it appears there has been a significant decline in the productivity of American K-12 public schools if productivity is defined as outputs divided by inputs.

A good argument can be made that staffing in American public schools needed to increase from what was present decades ago. Prior to the racial integration of public schools, many African American children had little or no taxpayer funds spent in their segregated schools. Second, students in less wealthy school districts often had much less spent on their educations than students in more affluent areas. Third, students with special needs often had relatively few resources devoted to their educations and needs. However, court cases and changes in federal and state policy led to dramatic increases in public school staffing in the 1950s, 1960s, 1970s, and 1980s. Are these large surges in public school staffing—especially in non-teaching personnel—still warranted today?

What then is the rationale for dramatic staffing increases post-1992? Nationwide, the number of school administrators and non-teaching staff increased 46 percent since 1992, compared with 17 percent growth among students and 32 percent increases for teachers. Regardless of the cause of that increase, its defense certainly can't be found in the results: From 1992-2008, NAEP Reading scores on the Long-Term Trend dropped four points, while Math scores stayed the same.

⁵ The NAEP Long-Term Trend Assessment is given every four years to a national sample of nine, thirteen, and seventeen year old students. This exam is better than the Main NAEP Assessment for analyzing national trends over time because the Long-Term Trend Assessment has been “relatively unchanged” since it was created, while the Main NAEP Assessment changes “about every decade to reflect changes in curriculum.” For a description of the NAEP Long Term-Trend Assessment and how it compares to the Main NAEP Assessment, please see http://nces.ed.gov/nationsreportcard/about/ltt_main_diff.asp.

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Are American Students Getting Worse Over Time?

Perhaps all the extra public school staff were necessary because American students have become more disadvantaged over recent decades. Many believe children enrolled in schools today are “harder to teach” than children a generation ago; Berliner and Biddle (1995) may be the most prominent and oft-cited proponents of that view. Presumably, family breakdown, increased child poverty, or other factors may have caused the decline in graduation rates and the lack of increased test scores. There is good evidence that family breakdown and low family income do contribute to poorer rates of student achievement (see, for example, Heckman (2008)).

Although rates of living with one parent increased dramatically in the latter half of the 20th century, in other respects current American students are more advantaged than their parents were. Specifically, American students typically live in households with more income, more educated parents (although that will be changing because of the decline in public high school graduation rates), and have fewer siblings than previous generations. Higher income, more educated parents, and fewer siblings have all been shown to increase student achievement. Thus, those factors may offset the negative social trends that may decrease student achievement. Because there are factors that, by themselves, would lead to increases or decreases in student achievement, the extent to which American students are harder or easier to teach overall relative to the past is an empirical question.

That issue was considered by Hoxby (2003), who found that the characteristics of American students in 1998-99 were on balance “more beneficial for achievement” relative to 1970-71. Thus, contrary to the belief espoused by Berliner and Biddle (1995), American students did *not* become harder to teach during the period of large increases in per-pupil spending, slumping American high school graduation rates, and constant or declining test scores. Hoxby (2003) states:

“One does not have to be hopelessly optimistic to think that regular public schools in the U.S. could be substantially more productive. Straightforward productivity estimates suggest that their productivity was approximately 65 percent higher in 1970-71 than in 1998-99, the most recent year for which we can produce estimates. The 65 percent figure is what one gets by dividing National Assessment of

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Educational Progress scores by per-pupil spending, adjusted by the Consumer Price Index.... If one adjusts for the family background of student test-takers, the estimated decline in productivity grows slightly *larger*, to 68 (percent) or 69 percent. (The 68 percent figure is based on using coefficients from 1998-99 and the 69 percent figure is based on using coefficients from 1970-71)." (Hoxby, 2003: pg 16-18)

Hoxby continues:

"That is, I did an Oaxaca decomposition using coefficients from a cross-sectional regression of achievement on students' characteristics and employed data from, first, 1970-71 and, then, 1998-99. *Either set of coefficients suggests that students' characteristics were more beneficial for achievement in 1998-99 than in 1970-71* (emphasis added). The characteristics that can be considered are race, gender, region, parents' education, parents' income, number of siblings, having a single-parent family, and being an immigrant or child of an immigrant. The variables that are especially responsible for making family background more beneficial in 1998-99 are parents' education, number of siblings, and parents' income." (Hoxby, 2003, pg 18)

Greene and Forster (2004) create a "teachability" index to estimate changes over time in challenges to student learning. Their results are strikingly similar to Hoxby (2003)—student disadvantages that impede learning actually declined by 8.7 percent between 1970 and 2000. Greene and Forster (2004) consider more covariates in their analysis relative to Hoxby (2003).

Thus, it appears American students, on balance, are slightly more advantaged than students of a few decades ago—contrary to the claims made by Berliner and Biddle and many other public school advocates. Despite that relative advantage and the rather large increase in spending devoted to public education, public high school graduation rates were lower over the time period considered above and test scores have been flat or have declined slightly.

Data from the U.S. Census paint a similar portrait—in some respects American students are more disadvantaged, but in other respects they have more advantages than their ancestors. For example, in 1959, the child poverty rate in the United States stood at 27.3 percent. By 1992, the child poverty rate had declined to 22.3 percent. In 2009, the child poverty rate stood at 20.7

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percent (Children’s Defense Fund, 2010).⁶ All else equal, the decline in childhood poverty should have led to higher student achievement. On the other hand, the percent of children who were foreign-born increased to 12 percent in 2010, from 7.9 percent in 1990, and 6.8 percent in 1950, according to the U.S. Census Bureau.⁷ Students who are not native English speakers may require extra help to learn English and succeed in school. The percent of children who lived with only one parent increased significantly between the mid-1960s and 1996, but that trend has not worsened further since then (Kreider and Ellis, 2011).

How Can Public Schools Lower Class Size and Increase Administrative and Other Non-Teaching Staff, Yet Not Increase Student Achievement?

“So the real danger we face in simultaneously pursuing higher teacher standards and smaller classes is that we will have a small but excellent corps of teachers who have met the raised standards but a growing number of classrooms that we will be forced to staff with any warm bodies we can find.”

Arthur Levine (1999),
former Dean of Columbia’s Teachers’ College

If a given teacher has a smaller class size, she may be more effective because she could spend more time with each student on his or her unique needs. Also, there may be better classroom discipline, fewer disruptions, etc. Certainly that teacher would not become less effective with fewer students in the classroom. But, read the first sentence of this paragraph carefully—if a *given* teacher.... If class sizes are lowered, many students will be taught by one of the newly hired teachers, and that is the key insight to understanding the trade-off between class size and teacher effectiveness.

⁶ The decline in childhood poverty rates from 1959 to 2009 was not linear. After significant decreases in the 1960s, the childhood poverty rate has experienced swings with changes in the U.S. macroeconomy (Children’s Defense Fund, 2010).

⁷ This information on the percent of foreign born children from the 1950 Census and 1990 Census can be accessed from <http://www.census.gov/population/www/documentation/twps0029/tab07.html>. This information from the 2010 Census can be accessed from <http://www.census.gov/population/foreign/data/cps2010.html>.

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Trade-offs between quantity and quality exist in many realms of life, including class-size reduction. If public schools across a state or the entire nation implement class-size reductions, they have to hire thousands of more teachers. As public schools do so, they may fill classrooms “with any warm bodies (they) can find.”

Rivkin, et al. (2005), Koedel and Betts (2011), and many other careful empirical studies document the wide disparity in teaching effectiveness within the public education system.

Based on those results, Hanushek (2010) reports:

“Some teachers year after year produce bigger gains in student learning than other teachers. The magnitude of the differences is truly large, with some teachers producing 1½ years of gain in achievement in an academic year while others with equivalent students produce only ½ year of gain. In other words, two students starting at the same level of achievement can know vastly different amounts at the end of a single academic year due solely to the teacher to which they are assigned. If a bad year is compounded by other bad years, it may not be possible for the student to recover. No other attribute of schools comes close to having this much influence on student achievement. The available estimates for, say, class size reduction, do not suggest any leverage past the earliest grades of school, and then the expected effects are small.” (Hanushek, 2010: pg. 3)

In an earlier study, Hanushek (2002) put the results regarding the large differences in teacher effectiveness in context:

“We can also return to the popular argument that family background is overwhelmingly important and that schools cannot be expected to make up for bad preparation from home. The latter estimates of teacher performance suggest that having three years of good teachers (85th percentile) in a row would overcome the average achievement deficit between low-income kids (those on free or reduced-price lunch) and others. In other words, high quality teachers can make up for the typical deficits that we see in the preparation of kids from disadvantaged backgrounds.” (Hanushek, 2002: pg. 3)

As public schools have reduced class sizes continually since at least 1950, they have had to hire more teachers. And, the evidence is in—the disparity in effectiveness across teachers is

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considerable. Accordingly, state governments and local public school boards should have been more concerned with improving teacher effectiveness than lowering class sizes.

Analogously, hiring more non-teaching personnel likely lowers the average quality of that workforce as well. Another concern with hiring more non-teaching staff is the possibility it increases bureaucracy and reduces the amount of time and energy teachers can devote to their students. Berliner and Biddle (1995) called excessive “bureaucratization” one of the “real problems of American education”—and their information on bureaucracy comes before the post-1992 time period under study here. Thus, there has been a rather dramatic increase in bureaucracy even since public school advocates Berliner and Biddle claimed that excessive bureaucracy was a problem.

“I used to be up late preparing creative lessons that I loved. Now I’m up late getting my data in,” a Fairfax, Virginia teacher told the *Washington Post* in 2011. The *Post* reporter continued, “She and others from her school said administrative chores have become so excessive that teachers have broken down and cried at work.” (McCartney, 2011).

That news article pins the blame for the increase in “administrative chores” for teachers on testing requirements under NCLB. However, excessive paperwork for teachers has long been a feature of the American public education system. In 1987, researchers had teachers fill out time diaries and found that, on average, they spent eight hours per week on paperwork either at school or at home (Freed and Ketchum, 1987). In addition, public school teachers and administrators often have complained about excessive paperwork under the federal Individuals with Disabilities Education Act (IDEA). The National Association of Elementary School Principals (NAESP) and others have advocated for a reduction in paperwork. NAESP quoted one teacher as saying, “It’s the additional special-education paperwork that I find most burdensome because I have to generate the same information and repeat it over and over on different forms.” (Klein, 2004: pg 58). A study commissioned by the U.S. Department of Education found that paperwork was burdensome for special education teachers and recommended reducing it. (Klein, 2004)

A decline in average educator quality (the result of hiring more teachers and non-teaching staff) and increased bureaucracy and paperwork (that is perhaps inherent when more non-teaching staff are employed) may be the reasons increased staffing in public schools has

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not appeared to boost student achievement.⁸ Regardless of the reasons, public schools have increased staffing dramatically, especially non-teaching personnel.

Opportunity Cost of the Increased Employment of Non-Teachers

Suppose administrators and other non-teaching staff had not increased disproportionately relative to the increase in students. What if, between FY 1992 and FY 2009, the percent change in employment of non-teaching staff had mirrored the percent change in the student population?

Between FY 1992 and FY 2009, the number of non-teaching personnel in American public schools increased to 3.1 million full-time equivalents (FTEs) from 2.1 million FTEs, a 46 percent increase. If the number of non-teaching personnel had merely matched student growth and increased “only” 17.2 percent, the number of non-teaching personnel nationwide would have been 2.5 million in FY 2009. Thus, the actual number of non-teaching personnel was more than 606,000 FTEs above what would have been if staffing growth had been proportional. Some claim that a large proportion of public school budgets represent “fixed” costs. If that were true, the increase in administration should have been *less* than the increase in students.⁹

As an extremely cautious assumption, assume the average compensation and employment costs of those non-teaching personnel were only \$50,000 per year per employee in FY 2009.¹⁰ If that were the case, what would public schools in the United States have been

⁸ Proponents of smaller class sizes typically cite the evidence from the Tennessee STAR experiment that finds that smaller class sizes in grades K-3 may lead to achievement gains for students. While this conclusion from that experiment is controversial, let's suppose this interpretation of the research findings is accurate. If it is the case that this experiment that involved 11,600 students showed that class size reductions boosted student achievement, that result should be translated into policy with care. A statewide, national or other larger scale reduction in class size could have different effects because of the very large number of new teachers that would have to be hired to create the smaller classes. It is likely that these new teachers would be less effective, on average, than the incumbent teachers. Based on the evidence that there are extremely large differences in teacher effectiveness, these new teachers could lead to lower average student achievement and offset any gains of smaller classes taught by the incumbent teachers.

⁹ For estimates and an analysis of fixed and variable costs in public education see Scafidi (2012a).

¹⁰ Data on the employment costs of non-teaching and non-administrative personnel in public schools are not readily available. However, there is some information available for the state of Georgia. Public school employees in Georgia who are not employed as teachers and hold a valid teaching certificate (e.g., superintendents, assistant superintendents, principals, assistant principals, librarians, curriculum directors, etc.) are paid on average 1.38 times more in salary than the average Georgia teacher. Source: author's calculations from

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able to save if they had limited changes in the employment of administrators and other non-teaching personnel to the changes in their student populations? The answer to that question comes from taking the “extra” non-teaching personnel and multiplying it by the assumed \$50,000 in costs per employee. For the United States as a whole, that calculation indicates American public schools would have had an additional \$30.3 billion in FY 2009 (606,633 x \$50,000 = \$30.3 billion). That \$30.3 billion would be annual recurring savings in public schools that could be used for other worthy purposes. For context, \$30.3 billion could have been used to provide about 3.3 million students with \$9,000 vouchers to be used to offset tuition payments at private schools. Alternatively, \$30.3 billion could have been used to give each teacher in FY 2009 a raise of over \$9,400 per year.

There has been considerable interest in the original “Staffing Surge” reports that I wrote for the Friedman Foundation for Educational Choice (Scafidi, 2012b, 2013), including several critics (Roy, 2012; Hull, 2012; National Coalition, 2012). However, none of the critics dispute the growth in employment numbers or that Long-Term Trend test scores from the National Assessment of Educational Progress (NAEP) have been flat or have fallen slightly.

Mr. Roy writes in his critique: “The unstated rationale behind the report is that instructional expenditures are more effective in terms of raising student achievement and the trend of higher growth in non-teaching personnel over the last two decades is indicative of bureaucratization and ‘non-productive’ spending. As discussed below, this maintained hypothesis of spending on teachers being *always* more effective is unlikely to hold irrespective of context. That is, it is likely true in some contexts but untrue in others.” (Roy, 2012: pg 3). He continues: “As yet there is no consensus in the research literature as to the proper balance between instructional expenditures and administrative expenditures.” (Roy, 2012: pg 5)

[http://reportcard2009.gaosa.org/\(S\(eqwgssn1o2c3z0bbu4bum255\)\)/k12/persfiscal.aspx?TestType=pers&ID=ALL:ALL](http://reportcard2009.gaosa.org/(S(eqwgssn1o2c3z0bbu4bum255))/k12/persfiscal.aspx?TestType=pers&ID=ALL:ALL)). However, it is likely the public school employees who do not hold valid teaching certificates are paid less, on average, than teachers. In Georgia, these personnel are called “classified employees”. In FY 2009, public school teachers in the United States were paid on average \$54,319, according to the 2011 Digest of Education Statistics (Table 83). An average of \$50,000 per employee in salary, benefit, and employment costs seems to be a large underestimate of the true costs per non-teaching employee in American public schools considering that a sizeable fraction of non-teaching personnel are paid well above teachers and that the \$54,319 figure does not include benefits and other employment costs.

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“The Staffing Surge” does not imply classroom expenditures are better or worse than other expenditures; it merely points out there have been dramatic increases in the employment of teachers and even more dramatic increases in the employment of administrators and other non-teaching personnel in public schools over the past few decades. And, those significant increases in staffing have not been accompanied by increases in measurable outcomes for students.¹¹

Comparing Productivity Changes in American Higher Education and K-12 Education

In his 2004 book *Going Broke by Degree: Why College Costs Too Much*, Dr. Vedder shows that real current spending per student in U.S. higher education increased from \$5,008 per student in 1929-30 to \$18,396 in 1999-00—a real increase of over 267 percent (Vedder, 2004: Table 3-1). Current spending excludes capital expenditures, and his data included public and private colleges and universities.

From 1976-77 to 1999-00, Dr. Vedder finds the increase in university staffing per hundred students increased from 18.52 to 20.83, an increase of 12.5 percent. During these time periods, Dr. Vedder makes a case that university teaching and research outputs were roughly stagnant (Vedder, 2004: pgs 50-59). Thus, Dr. Vedder believes—based on his research—that over time, colleges and universities have significantly higher costs yet similar rates of output over time.

Above, I present a case that outputs in American K-12 public education have been roughly stagnant over time, as measured by student test scores and public high school graduation rates. But how have costs and staffing in K-12 public schools changed over time as compared to the data Dr. Vedder cites for higher education?

Using the same data source as Dr. Vedder, the *Digest of Education Statistics* that is published annually by the National Center for Education Statistics at the U.S. Department of Education, the real increase in current spending per student in public K-12 education has increased from \$900 per student in 1929-30 to \$8,765 in 1999-00—an increase of 873.9 percent. The increases in real current spending per student for higher education and public K-

¹¹ See Scafidi (2013) for my response to each of the other claims made by the critics.

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12 education are compared in figure 8. As shown in figure 8, the increase in real public school spending per student was more than three times the increase that occurred in higher education over this 70-year period.

Regarding staffing, I could not use the exact same time period as Dr. Vedder due to a lack of data availability. However, for a shorter time period than considered by Dr. Vedder—1980-81 to 1999-00, staffing in K-12 public schools increased from 10.24 staff per 100 students to 12.02, an increase of 17.4 percent. As shown in figure 9, the increase in staffing per 100 students in K-12 public schools increased faster than the corresponding increase in higher education.

Real spending per student and staffing increased at much higher rates in public K-12 schools relative to the increases in higher education.

What has happened to staffing since 2000, when Dr. Vedder's analysis ended? The more recent trends in staffing are compared in figure 10. In higher education, the trend has reversed—colleges and universities have less staffing in recent years as compared to 2000. Specifically, in 2009-10, institutions of higher education employed 18.1 staff per 100 students, a staffing decline of 15.1 percent. But, in public K-12 education, the staffing surge continued. K-12 public schools employed 12.02 staff per 100 students in 1999-00, and by 2009-10 staffing had increased to 12.87. While staffing in higher education declined by 15.1 percent per 100 students during the first decade of the 21st Century, staffing in public schools increased by 7 percent.

Suppose that the analysis by Dr. Vedder finding stagnant outputs in higher education and both Dr. Vedder's and my analyses finding stagnant outputs for public K-12 education are both correct. If that is the case, then the productivity decline in public K-12 education is significantly greater than that for higher education.

For higher education, Dr. Vedder has proposed a variety of potential solutions to solve the productivity problem, including allowing more competition among providers and choice for consumers, allowing for-profit institutions more access to higher education markets, on-line learning, tying taxpayer subsidies to students to the value-added in their knowledge and skills, and greater use of private certifications of skills that bypass higher education altogether

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(Vedder, 2004). The next section describes Dr. Vedder's creative solution to simultaneously solve the productivity problem in K-12 public education and overcome political resistance to injecting more competition and choice into the K-12 education system.

Universal School Choice and Converting Public Schools to Employee-Owned Enterprises

In a short book, *Can Teachers Own Their Own Schools?*, published in 2000 by the Independent Institute and the Thomas B. Fordham Institute, Dr. Vedder makes a case for universal school choice—and turning over ownership of public schools to public school employees. Dr. Vedder proposes that ownership of individual public schools be turned over to school employees through an employee stock ownership plan (ESOP).

ESOPs began in the private sector in the United States in the 1970s. According to the National Center for Employee Ownership (2014), about 25 million private sector workers own shares of their employer either directly or indirectly through their retirement accounts or stock options, and there are 100 American companies, each with over 1,000 employees, where the company's employees own a majority share of the company.

Vedder (2000) suggests that we bring the ESOP model to public schools. Under the Vedder-ESOP proposal public school employees would be given shares of stock ownership in the public schools where they are employed. As a starting point for discussion, he suggests that principals would receive 200 shares for each year of experience, teachers and other professional staff (assistant principals, counselors, librarians) would receive 100 shares for each year of experience, and support staff (bus drivers, cafeteria workers, and janitors) would receive 50 shares of stock for each year of experience. The principal would be the initial CEO of the company, and the company would own all school property.

Updating and simplifying an example from Vedder (2000), suppose a school had 1 principal, 50 teachers, 22 professional staff, and 28 other staff and that each staff member had 15 years of experience. Under Vedder's allocation of stock, the principal would own 3,000 shares (15 years * 200 shares per year), each teacher and professional staff member would own 1,500 shares (15 years * 100 shares per year), and other staff would own 750 shares each (15 years * 50 shares per year). The total number of ownership shares would be 132,000. Of those

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132,000 shares, teachers would own 75,000 shares; other professional staff would own 33,000 shares; other staff would own 21,000 shares, and the principal would own the remaining 3,000 shares.

How much would these shares of stock be worth? Suppose the value of all school assets minus debt—land, building, buses, computers, desks, books, etc.—was \$5,000,000. This \$5,000,000 is the book value of the school, and I purposely set this amount low to be cautious in this example. And, suppose the shares were worth 2 times the book value. (The companies in the S&P 500 are currently worth over 2.5 times book value, and the industries of the companies in the S&P 500 do not have a guaranteed market as the industry of K-12 education would through taxpayer funding for consumers through vouchers—under the Vedder proposal—and compulsory attendance laws, so this multiple of 2 may be low.) If the value of shares—that is, if the price of these shares at which employees could actually sell them—is 2 times book value, then a teacher's 1,500 shares would be worth over \$113,000 at the start ($\$5,000,000/132,000 \text{ shares} = \37.88 —the book value; and $\$37.88 * 2 * 1,500 \text{ shares} = \$113,636$).

So, each teacher in this example is now \$113,000 wealthier, and each teacher is part-owner of a school. Each employee-owned school would now operate in an autonomous and competitive educational marketplace. All taxpayer funds devoted to K-12 education would be allocated directly to parents to be used to offset tuition payments at any school—private, charter, or employee-owned school. Thus, parents would have a choice among schools, and schools—including employee-owned schools—would have to compete for students and funds. All schools, including employee-owned schools, would have complete autonomy to decide their tuition, curriculum, class size, pay scale, student discipline, employee dismissal, governance, and all other school policies. Of course, all laws that apply to private schools would apply to employee-owned schools as well.

Would teachers and other public school employees support stock ownership? While they would lose the certainty of union-negotiated or government-imposed class size limits, salary schedules, and teacher tenure, they would gain autonomy and ownership. Dr. Vedder writes, "They (teachers and others) would be trading off the lifetime job security under the old

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arrangement for a significant increase in their wealth plus a greater say in how the school will operate.” (Vedder, 2000: pg. 30)

Vedder and Hall (2000) find there is another benefit to teachers from governments allowing more competition and choice into K-12 education. They point out that, theoretically, more competition among schools for students would also lead to more competition among schools for teachers. More competition for teachers would lead to higher pay and better benefits and working conditions. Using 1996 data on Ohio public school districts, Vedder and Hall find that teachers in public schools would experience a \$1,084 salary increase if the share of the students in their school districts increased from zero to 20 percent. This salary increase was equal to about 3 percent of the average district teacher salary in Ohio at that time.

Surely, some education reformers are skeptical that public school employees should be given ownership and control over tens of thousands of public schools worth billions of dollars. But skeptics should consider this significant transfer of wealth in light of the other piece of the Vedder-ESOP plan—universal school choice. Employee-owned schools would face a market test—students and the funds dedicated to their education would flow to the schools their parents deem best. If the employee-owned schools could not attract enough students, then the employee-owners would face a stark reality. Their choices would be to (a) improve the quality of their academic and social offerings, (b) hire new and better management, (c) sell their school land and facilities to another educational provider, or (d) see the value of their stock fall dramatically. Thus, employee-owners would have a powerful financial incentive to offer excellent educational programs or sell the valuable assets they own to someone who will.

In addition to ownership shares, myriad other details would need to be specified to convey ownership of public schools to public school employees. In the interest of even further increasing opportunities for parents to choose among schools, I offer one tweak to Dr. Vedder’s outline. I would allow public school employees to own vacant school properties as well. Many urban school districts collectively own hundreds of vacant school buildings. These districts have a poor track record in repurposing these properties or selling them (Dowdall and Warner, 2013).

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I see three tangible benefits of the Vedder-ESOP idea for public schools. First, the incentives of public school employees would become significantly more aligned with the interests of students and their families. Instead of advocating for job protections, cumbersome work rules, more non-teaching positions, and generous retirement benefits, employee owners of schools would advocate within their own school communities for changes that would increase enrollments and student and family satisfaction. Of course, employee owners would continue to advocate for more generous taxpayer funding for K-12 education. That would not change relative to the status quo, but employee owners would face a whole new and powerful incentive to meet the unique needs of each and every child—otherwise children whose needs are not being met will move to other schools that will meet their needs and the dollars used to fund their education will move as well. And, those employee owners would see the value of their stock ownership fall. Employee-owners who did offer an excellent education that is valued by parents would see the value of their stock ownership rise.

Second, teachers and other public school employees would come to see the benefits of increased diversity in school offerings—not just for students and parents, but for themselves as well. They would be able to create academic and social environments that they believe are best for students and not be subject to the whims of federal, state, and local officials who impose a large and ever-changing array of mandates on local schools. Given greater autonomy, job satisfaction would increase.

Third, it would dramatically increase parental choice and the diversity of educational offerings available to parents. Instead of being largely the same in terms of academic and other offerings like current public schools, employee-owned schools would differentiate their offerings and give parents opportunities to match academic and other programs to the specific needs of their children.

Given these benefits and given the evidence we have about the benefits of increased parental choice in education, the Vedder-ESOP proposal is something education experts,

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policymakers, parents, and other citizens should debate and some enterprising states or school districts should pursue.¹²

Conclusions

Richard Vedder has made well-known and important contributions to our understanding of changes in higher education productivity. Less well-known are his important contributions to our understanding of productivity in public K-12 education. Regarding the latter, in 1996 Dr. Vedder pointed out the declining productivity in K-12 education—stagnant outputs with significantly greater taxpayer-funded inputs over time (Vedder, 1996). To reverse the decline in productivity, Vedder (2000) offers a creative proposal to inject more competition among providers and choice for consumers among K-12 schools by converting American public schools into for-profit and employee-owned enterprises.

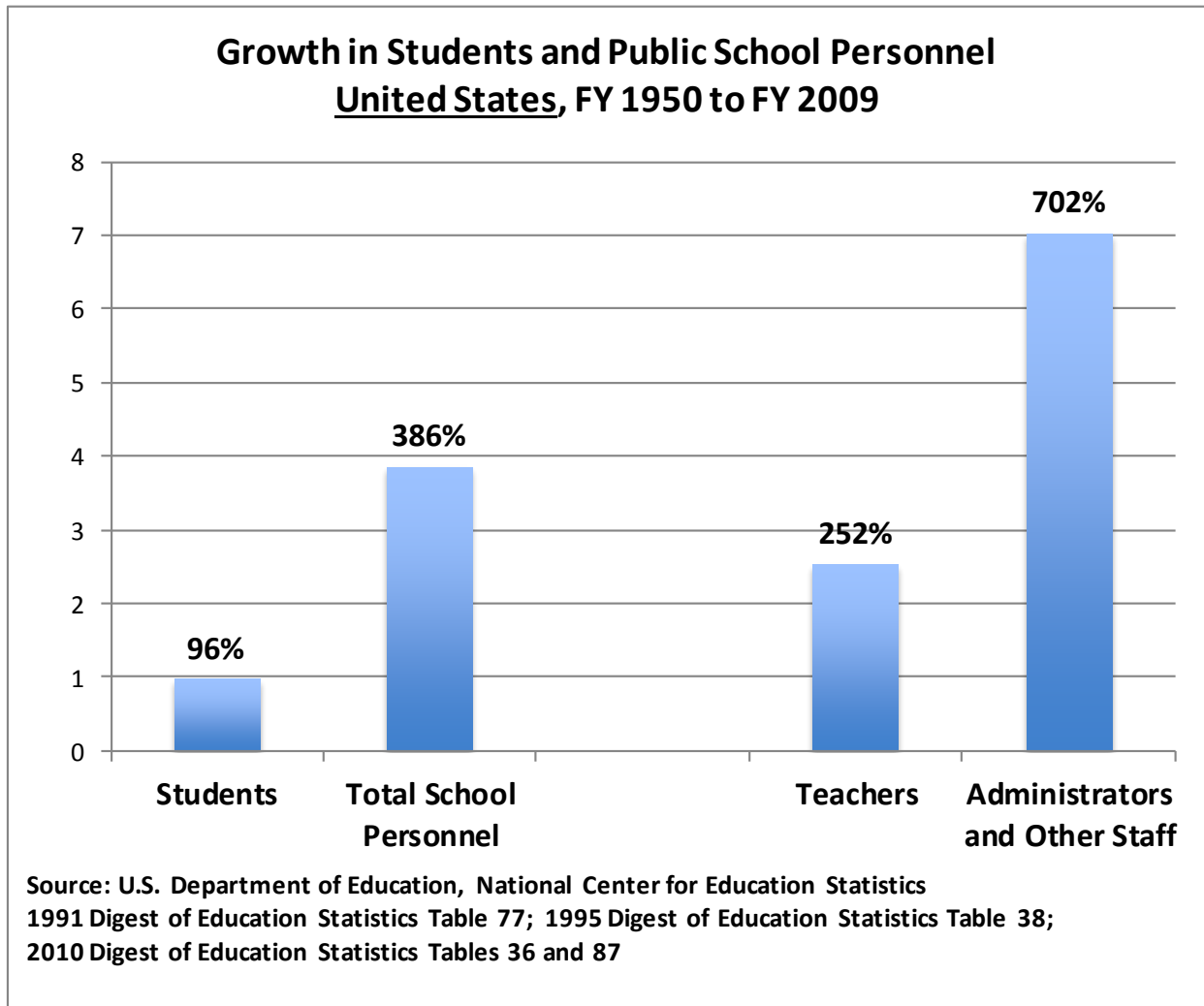
While, Dr. Vedder has been rightly concerned with productivity in American institutions of higher education, the analysis presented here shows that the productivity problem in American public K-12 schools is significantly greater. Specifically, over the 1929-30 to 1999-00 time period analyzed in Vedder (2004), the real increase in current spending per student in higher education increased by 267 percent, while the corresponding increase for public K-12 schools was about 874 percent. Further, in the first decade of the 21st Century, staffing per 100 students declined in American colleges and universities from 20.83 staff per 100 students to 18.1. This staffing ratio in higher education in 2010 was less than the staffing in 1976-77, as reported in Vedder (2004). Thus, at least one-half of the higher education productivity fraction has improved in recent years—perhaps due in part to Dr. Vedder sounding the alarm and to changes in higher education delivery suggested by Dr. Vedder—on-line learning and for-profit education. However, the trend in public K-12 education has continued to worsen—during the first decade of the 21st Century public school staffing per 100 students increased by 7 percent.

Perhaps it is time to heed Dr. Vedder's advice for public K-12 education as well and expand competition and choice through vouchers, tax credits, and by converting individual public schools into autonomous and employee-owned enterprises.

¹² See Forster (2013) for a summary of the evidence regarding programs that increase parental choice in education to private schools.

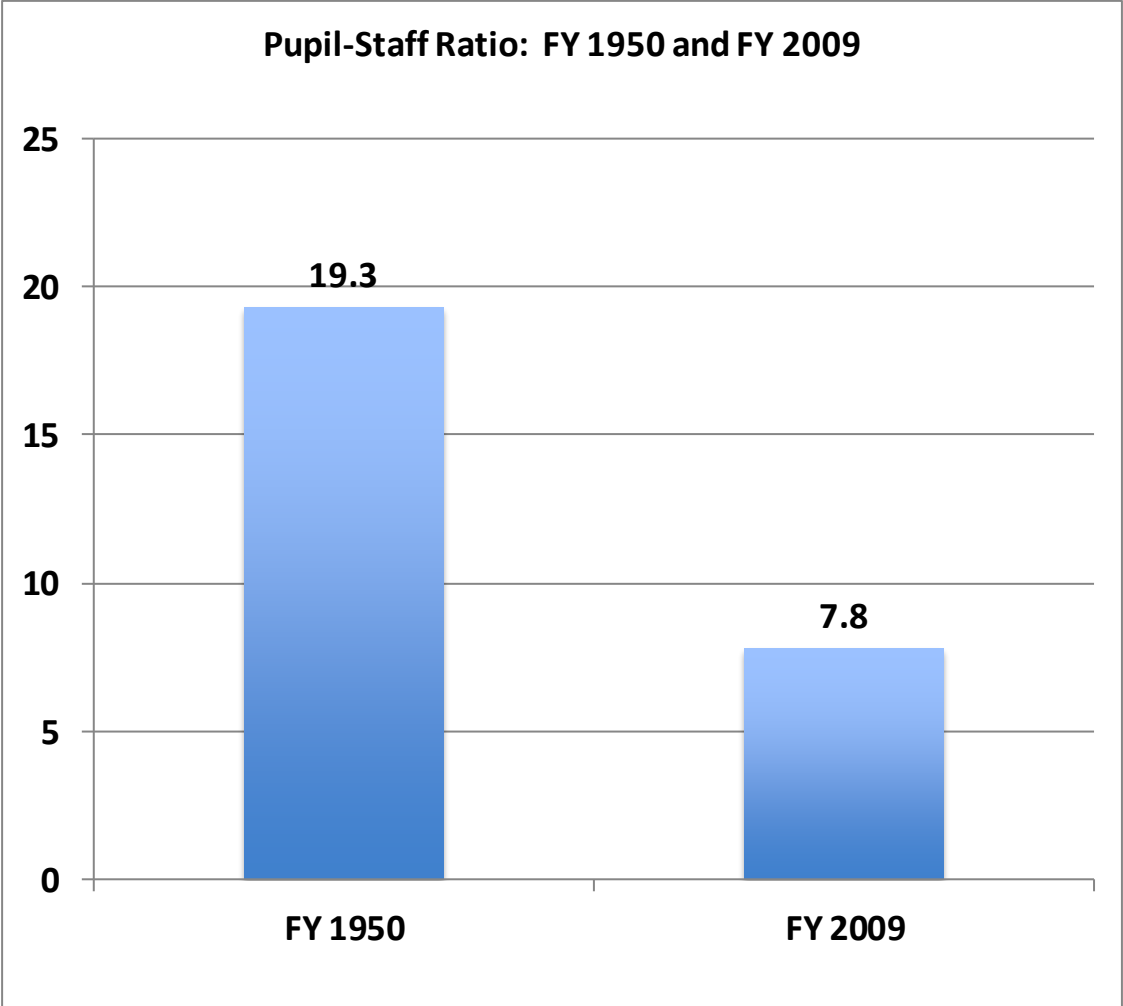
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Figure 1



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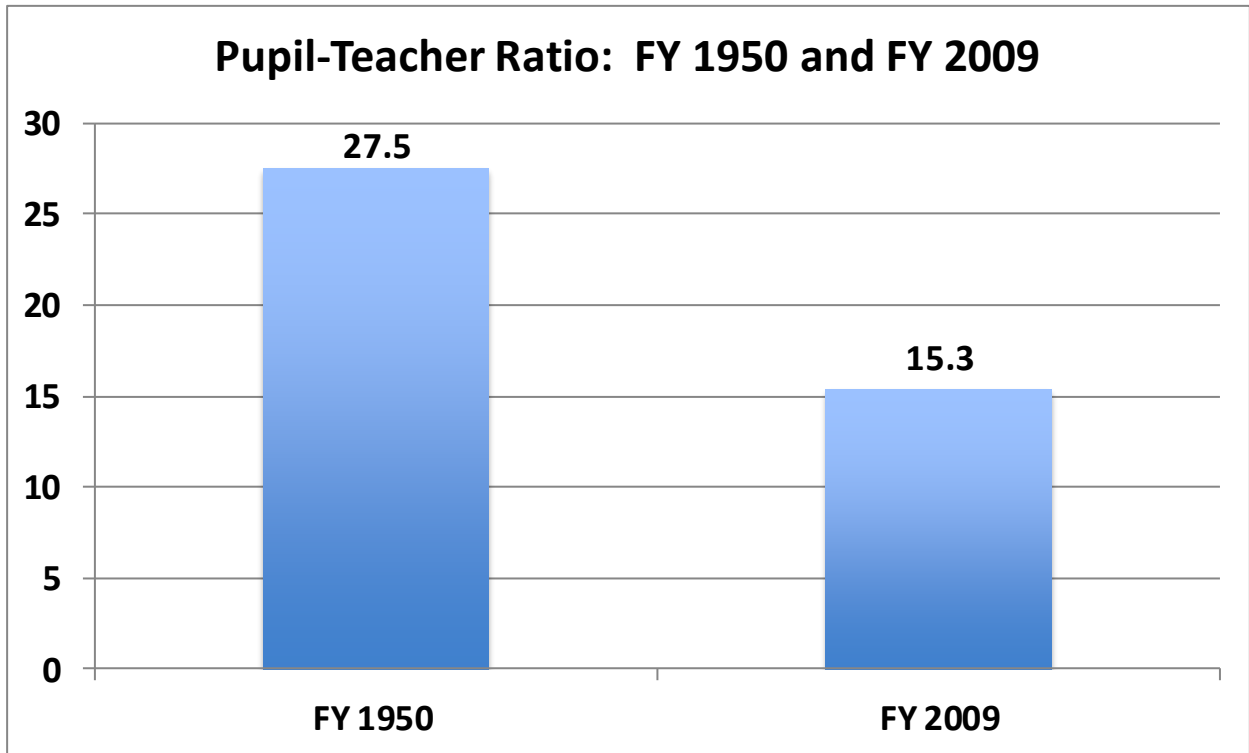
Figure 2



Source: U.S. Department of Education, National Center for Education Statistics, 1990 Digest of Education Statistics, Table 76; 2011 Digest of Education Statistics, Table 89.

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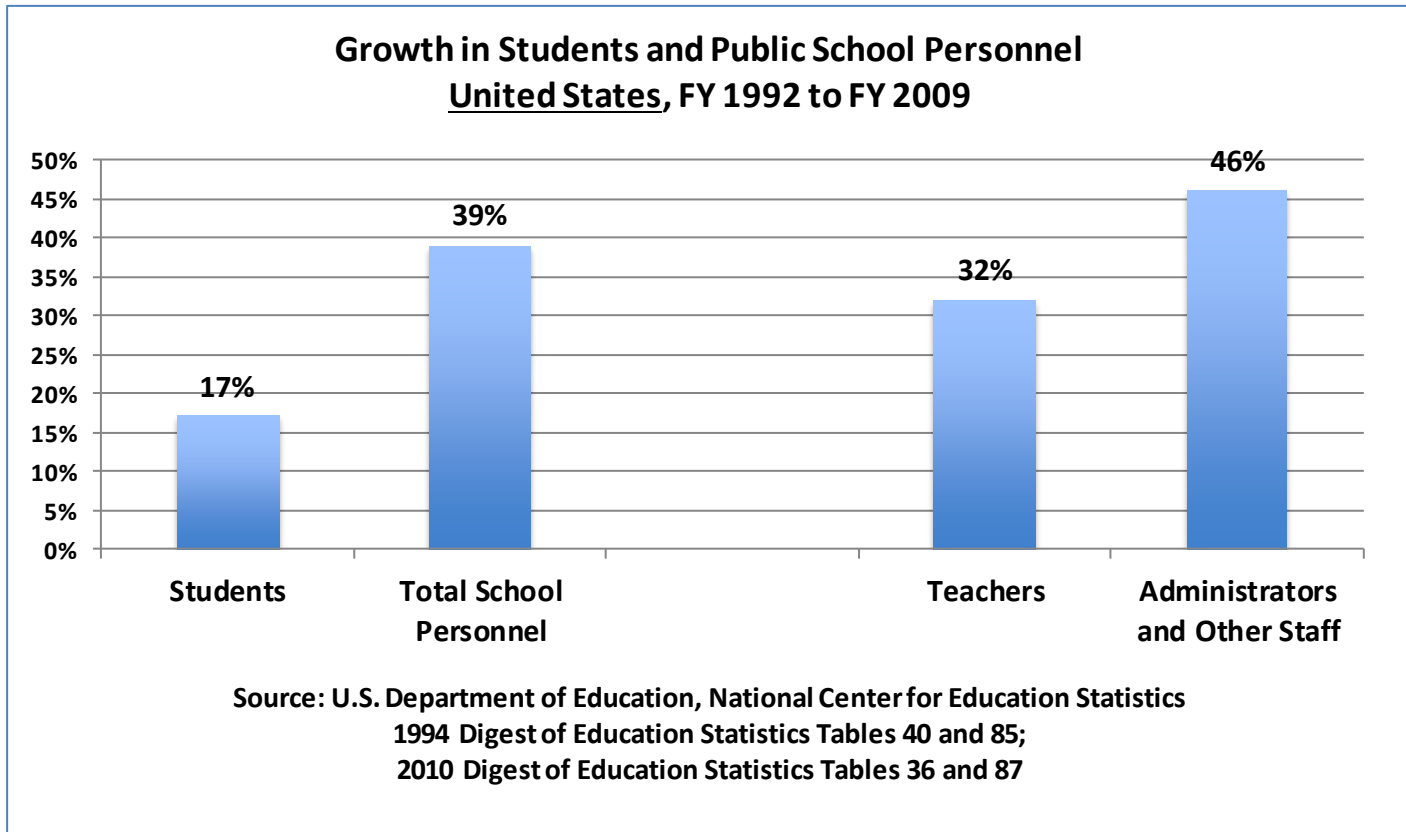
Figure 3



Source: U.S. Department of Education, National Center for Education Statistics, 1990 Digest of Education Statistics, Table 76; 2011 Digest of Education Statistics, Table 69.

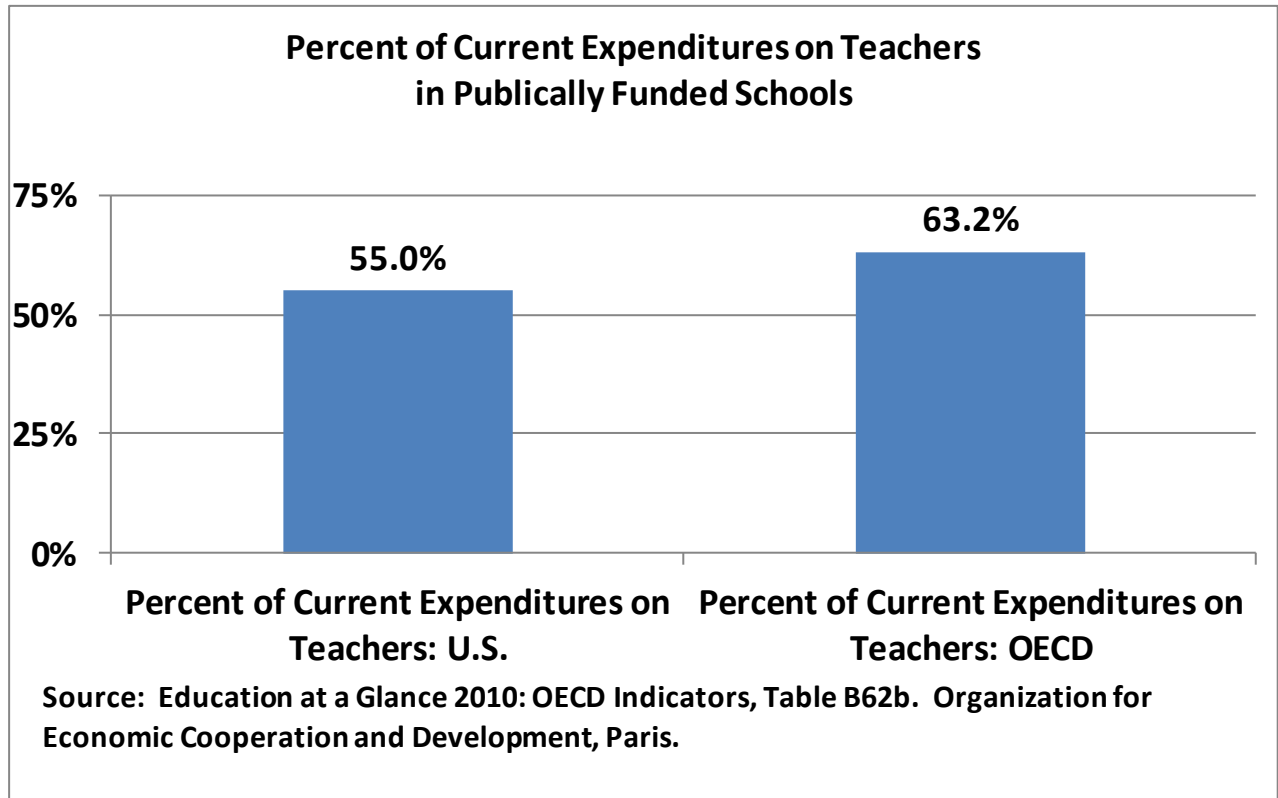
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Figure 4



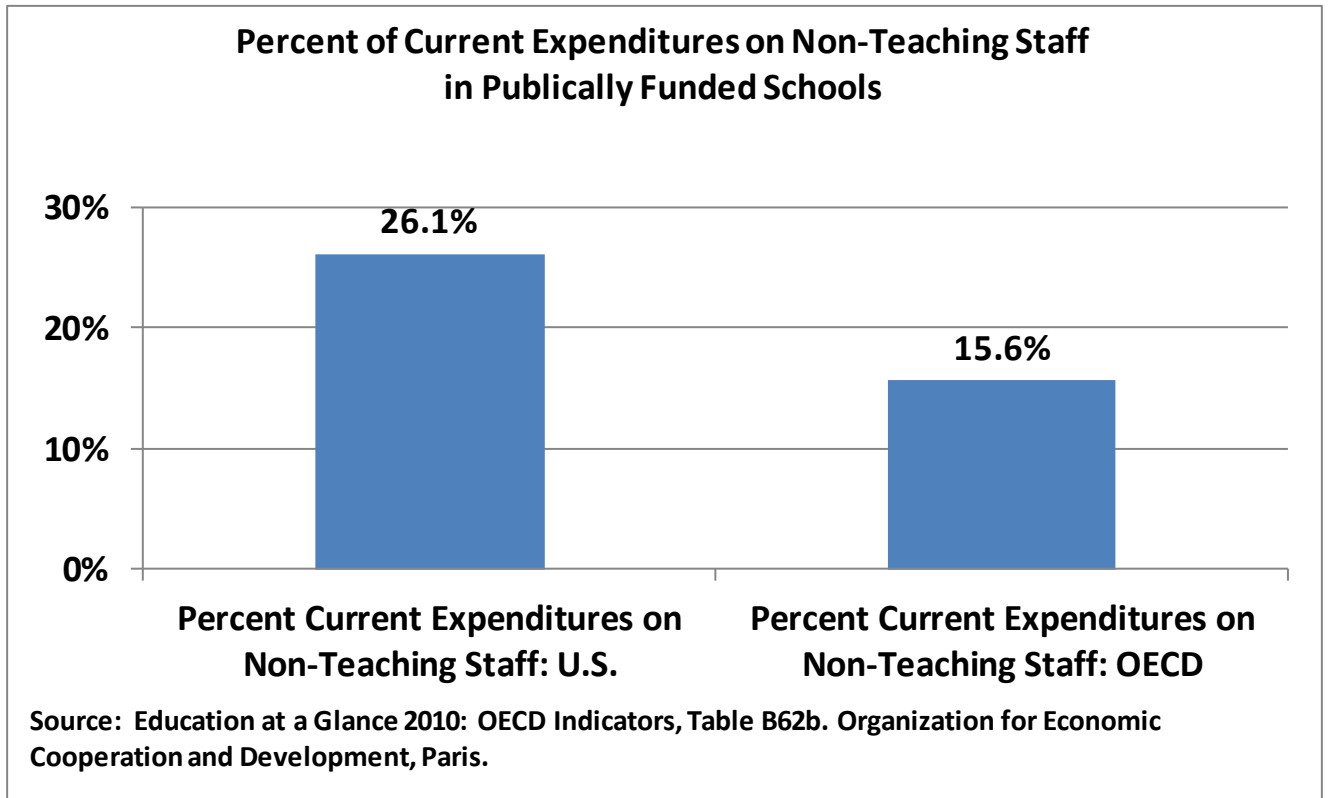
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Figure 5



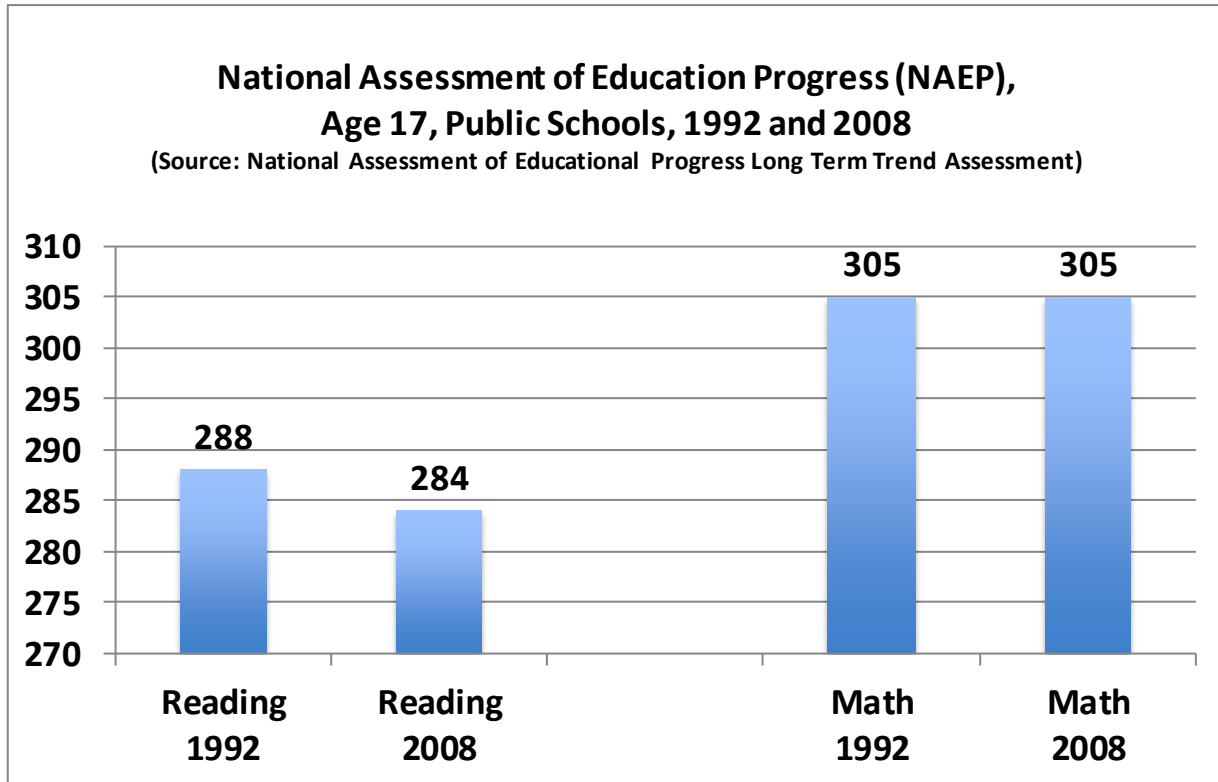
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Figure 6



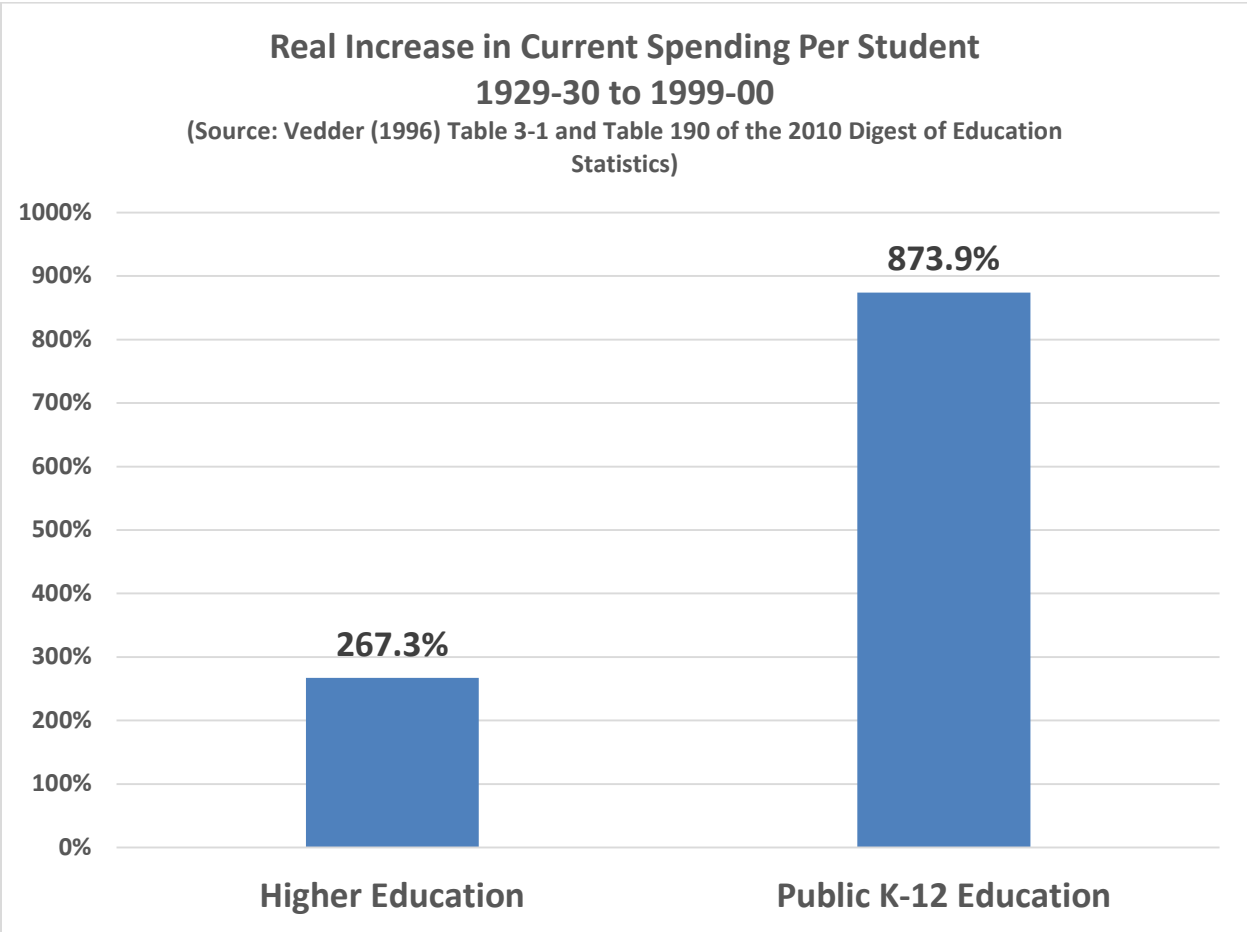
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Figure 7



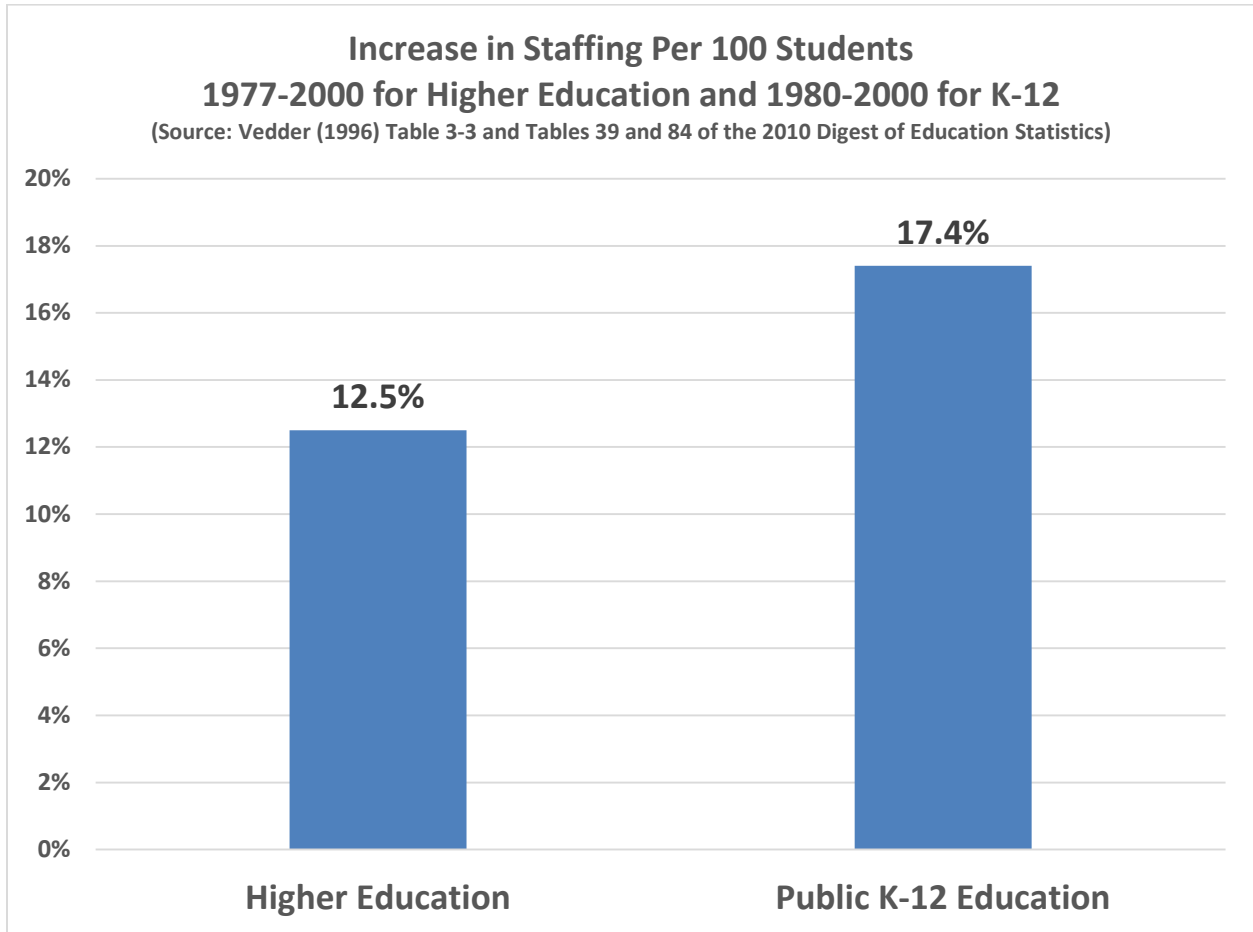
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Figure 8



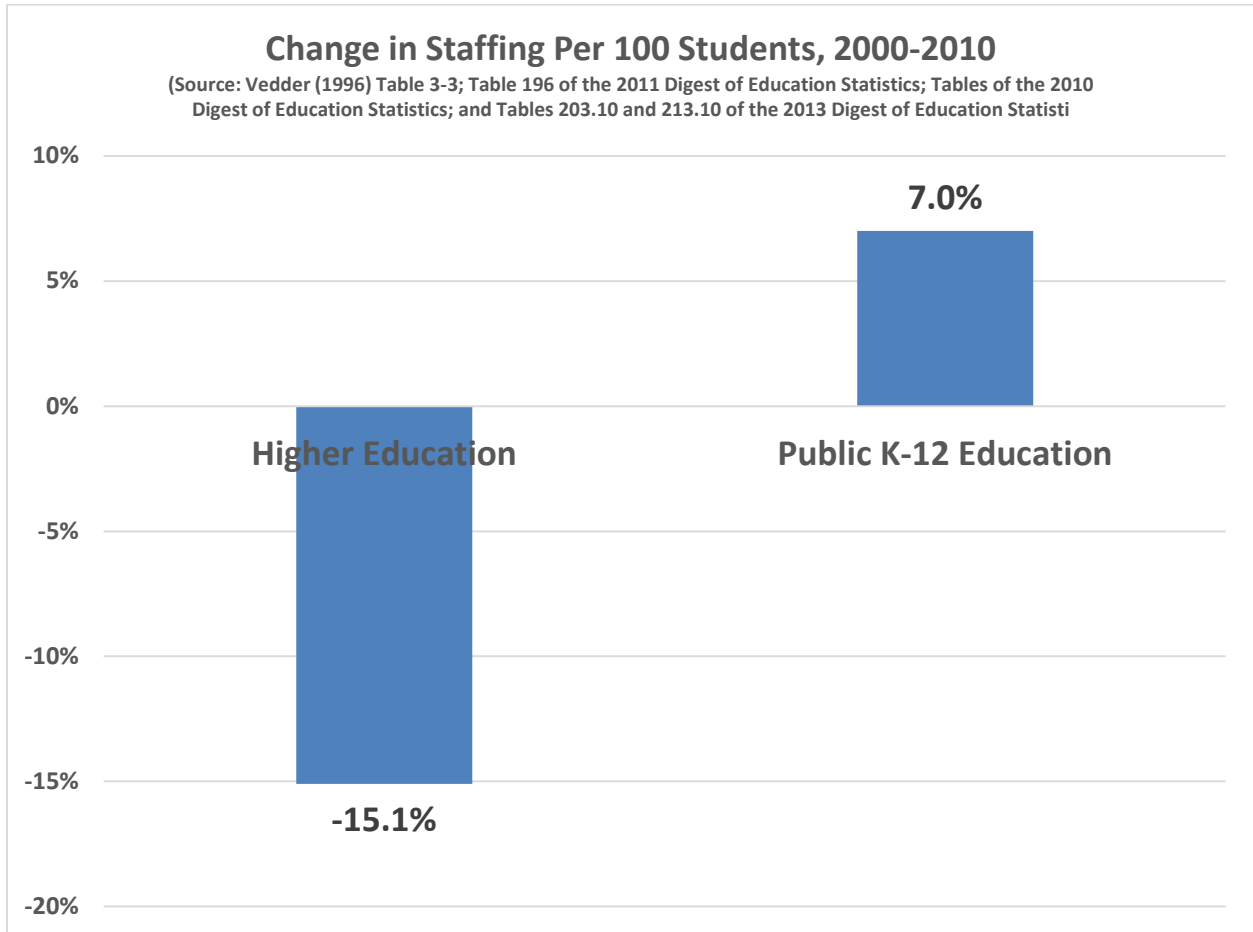
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Figure 9



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Figure 10



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