

As concerns about falling high school graduation rates and preparedness for the modernized economy continue to grow, support for new educational paradigms has gained strong support. Career and Technical Education (CTE) classes are intended to teach students practical, career-orientated skills in order to help them obtain and maintain a job in the future, and the Colorado General Assembly's consideration of HB 18-1034 underscores its support for this belief. This paper considers CTE, and specifically, the education level at which training is most appropriate, the federal role in both secondary and postsecondary vocational education, and the appropriateness of HB 18-1034 for achieving the goal of greater human capital investment.

In U.S. public high schools, 75 percent of students graduate on time and approximately 8 percent of students drop out. In large urban school districts, graduation rates are 60-65 percent, and dropout rates for children in the lowest income quintile are four times greater than those in the highest income quintile (Cullen 2013). These statistics are shocking considering that dropping out leads to educational deficiencies that severely limit one's level of economic and social wellbeing (Bridgeland 2006). These individual consequences also lead to social costs of billions of dollars (Sum, McLaughlin & Palma 2009).

While graduating from high school does not ensure an individual has a sufficient level of academic skills for successful employment and further education, failing to graduate almost ensures that a person does not. Studies confirm that, on average, dropouts have fewer academic skills than high school graduates generally and even graduates with similar demographics (Tyler & Lofstrom 2009 and referenced studies).

Because of their limited academic skill set, many high school dropouts find it difficult to secure steady employment and an adequate income. A comparison of those who receive exactly twelve years of education versus those who stop just short of receiving a high school diploma yields a \$300,000 difference in lifetime earnings (American Community Survey 2010).

However, forgone income and insufficient academic skills affect only the individual who made the decision to drop out. Therefore, these costs are private, and do not provide a sufficient justification for government intervention in this market. However, falling graduation rates are also

associated with substantial societal costs that not only motivate but necessitate governmental involvement.

· Compared to successful graduates, high school dropouts are more likely to require a wide range of social services, including welfare, medical assistance, and unemployment assistance. They are also more likely to engage in crime, have poorer health, have lower rates of intergenerational mobility, and lower rates of political participation (Rumberger 2001). In one of the most comprehensive studies, Levin (1972) estimated that the social costs of providing social services and fighting crime associated with dropping out was \$6 billion per year. Today, this figure would be much higher.

It is clearly worthwhile for the government to facilitate successful high school completion for our nation's students. However, there are a wide variety of factors that dampen graduation rates, including demographic, family-related, school-related, economic, and individual. School-related factors have received considerable attention, particularly because they can be easily manipulated through policy. Indeed, the area of reform with the largest potential to improve high school outcomes is provision of an increased variety of educational models to schools (Jacob and Ludwig 2008), particularly programs with a vocational focus.

Programs with a specialized focus can help struggling students by playing to their interests. The most frequently cited reason for why students dropped out is that they disliked school, with 36 percent of white males and 27% of white females claiming this as their primary concern (Rumberger 2001). Furthermore, of the 70% of high school completers who enroll in two or four year universities directly following high school, only around 40% enroll in a four-year program, and only 60% of those students will graduate in six years or less (Cullen 2013). For many high school students, preparing for a four-year university does not match well with their career goals. Fortunately, vocational education can improve outcomes for these students by allowing them to focus on the aspects of school they enjoy and, thereby, potentially enabling the perceived gains from education to outweigh the appeal of dropping out.

Career-orientated tracks also provide students with technical skills valued by the market and workforce experience, while still assisting them in completing high school. Considering that the second most cited reason for why students failed to complete high school was their desire to work (Rumberger 2001), vocational tracks are a useful tool for helping schools retain high-risk students while also giving those students the tools necessary to be successful in the labor market. Indeed, while the returns from a postsecondary degree are unambiguously high, many relatively profitable industries require only a high school diploma (Cullen 2013).

Compared to people who did not complete high school, graduates earn more across many industries including business, law enforcement, manufacturing, and education. The returns for a high school diploma are particularly high in industries that demand sector-specific skilled labor. For example, among 35 to 44 year-old males, graduates who work in the technology industry earn on average \$50,000 more than dropouts in the same field (Cullen 2013).

In an effort to capture some of the aforementioned benefits, approximately 80% of high schools in Colorado offer technical education in the form of vocational courses like business and computer classes. However, there is likely to be a significant difference in the effectiveness of these courses compared to dedicated vocational schools on student outcomes (Pittman 1991).

By having career-focused tracks and partnering with local businesses and community colleges, vocational schools graduate students with technical skills and an established business network, along with the academic skills necessary to enter a two or four year college. This is a pedagogical model that directly addresses many of the root causes for high-risk students drop out (Kemple & Willner 2008).

Most high schools seek to provide students with skills from a college-preparatory and non-experiential perspective, with limited nonacademic support (Jordan, McPartland, Legters & Balfanz 2011). With regard to technical education, this mission is problematic because many of the disadvantaged students who would benefit from career-orientated programs lack the requisite skills required to succeed within this paradigm (Maxwell & Rubin 2000). Indeed, the focus on college

preparatory activities is likely to dilute the effectiveness of vocational tracks (Darling-Hammond 1997).

For these reasons, it is best to deliver the grants proposed in HB 18-1034 not to all school districts that contains high schools offering vocational courses, but rather to the select number of career academies in Colorado that focus solely on integrating students' academic and workforce experiences.

While vocational training targeted at high school students has the potential to greatly benefit both individuals and society, professional vocational education at the postsecondary level does not deliver nonpecuniary externalities of the type or magnitude of those attributable to vocational training at the secondary level (Marginson 1997; Powell & Clemens 1998; Pusser 2002). Rather, it is a form of human capital investment that strongly parallels investment in machinery, buildings, and other forms of non-human capital. Its function is simply to increase an individual's economic productivity (Turner 2004). When it is successful, the individual who invested is rewarded with a higher return for his services. This difference in earnings is the economic incentive to acquire the specialized training, just as the extra return that can be obtained from an additional machine is the economic incentive to invest capital in the machine.

In both cases, the potential for higher returns must be balanced against the costs of obtaining those returns. In the absence of state subsidies on investments or taxes on returns, when an individual pursues vocational education, he bears all of the costs associated with this choice and receives all of the benefits. As the costs associated with vocational training are fairly substantial— income foregone during the period of training, interest lost by postponing the beginning of the earning period, and the special expenses associated with the training—an individual presumably regards this investment as desirable only if he expects fairly significant returns in the long run.

For this reason alone, governmental intervention in postsecondary education is not required since the market will yield the socially efficient quantity of individuals pursuing vocational training. However, even if citizens felt that there was significant underinvestment in human capital and that governmental intervention, in the form of grants or subsidies, was required in this market, what HB

18-1034 proposes is not an appropriate approach. At the postsecondary level, this bill does little to address human capital investment. Rather, it simply reflects an imperfection in the capital market.

Investment in human beings cannot be financed on the same terms as investment in physical capital. If a fixed loan is made to finance investment in physical capital, the lender has some security in his loan in the form of a claim on the asset itself. However, if a comparable loan is made to increase the earning power of a human being, the security on that investment is minimal. The individual embodying the investment cannot be bought and sold. Although, if he could, the security would still not be comparable (Blundell, Meghir, Sianesi 1999). The productivity of the physical capital does not depend on the cooperativeness of the original borrower (Becker 1994). A loan to finance the training of an individual who has no security to offer other than his future earnings is therefore a much less attractive proposition: the security is less, and the cost of subsequent collection of interest and principal is much greater.

HB 18-1034 illustrates this reality. Instead of subsidizing the training of individuals directly, the bill proposes the usage of grants to fund equipment and building maintenance related to technical education. Consequently, this bill is likely to have minimal economic impact on human capital.

Furthermore, because government intervention is not required in this market, the introduction of government subsidies leads to overinvestment in capital training. As a consequence, the government is forced to restrict the subsidies. Apart from the difficulty of calculating the "correct" amount of investment, this involves rationing the limited amount of investment in some essentially arbitrary way among more claimants than could be financed. It also means that those fortunate enough to attend subsidized universities receive all the returns from the investment while the costs would be borne by the taxpayers in general. This seems like an arbitrary redistribution of income.

Technical education for students is important for both the students themselves and society. However, the importance of this education stops at the secondary level. While the implementation of career and technical programs for high school students is an appropriate goal for the government to be pursuing via HB 18-1034, the notion of subsidizing postsecondary vocational education is far

from beneficial. Indeed, if the government is truly interested in improving student outcomes and boosting human capital, it is better to direct grants to magnet schools and career academies where students will receive the attention they require and, ultimately, society will be better served.