**Attitudinal Trends in Alternative Postsecondary Learning**

John Vandivier

Traditional postsecondary learning in the United States consists in obtaining a four-year degree and is associated with increased earnings and employment. These benefits come at substantial public and private cost. Concerns about a public debt crisis are now common. Recent scholarship questions the return of educational expenditure. Alternative approaches to education represent a technological improvement which may allow for employability signal generation and skill development at a fraction of the price of the traditional process. Key bottlenecks to adoption of alternative learning approaches include limited public awareness, limited learner favorability, and limited employer favorability. This paper identifies explanatory factors in favorability, attitudinal changes over time, and actionable strategies to solve for limited awareness and favorability.

**KEYWORDS:** Education economics, alternative education, debt crisis, signaling

**JEL CODES:** D12, I21, I22, I24, I25, I26

1. **Introduction**

The concept of a student debt crisis has found durable academic and media coverage. In 1999, Roots called the student loan debt crisis a lesson in unintended consequences[[1]](#footnote-1). He identified the issue as attributable in large part to the Guaranteed Student Loan Program of 1965.

It was neither a new lesson at that time, nor a lesson finally learned at that time. Hansendn and Rhodes discuss the student debt crisis in 1988[[2]](#footnote-2). Van Dusen published a genuinely prescient paper, *The Coming Crisis in Student Aid*, in February 1979[[3]](#footnote-3). Forbes noted in 2019[[4]](#footnote-4) that “Student loan debt in 2019 is the highest ever…There are more than 44 million borrowers who collectively owe $1.5 trillion in student loan debt in the U.S. alone.”

Recent work has called into question both the social return and the individual return to spending on education[[5]](#footnote-5). Alternatives to the status quo in education present the opportunity for significant economic benefit. From 1989 to 2012, the average cost of a year of undergraduate education in the US rose 79%[[6]](#footnote-6). Over the same period, per pupil public expenditure for K-12 students increased 27%[[7]](#footnote-7). This indicates that postsecondary education presents a particularly valuable area of exploration.

From 1989 to 2012, K-12 student expenditure increased significantly and the cost of a year of undergraduate education grew nearly three times more quickly, but the adjusted average starting salary of a college graduate decreased. In real terms, the average starting salary of a college graduate decreased about 9%[[8]](#footnote-8). Additional temporal sampling from 1960 to 2015 indicate that the longer trend for education is modestly positive, with a real increase of about 6% over that period. It’s worth noting that the highest paying years for the degree were observed around 1970 in real terms, and salaries after the Great Recession have remained lower than the early 2000s.

Because the price of college is rising several times faster than the rate at which the salary of new graduates is increasing, the traditional degree is becoming a dynamically worse financial investment, even while current research shows it is already a relatively poor choice compared to investing in a standard fund. College might still be an optimal consumption choice if students demand higher education as a leisure good, but survey data indicates that this is not the case. Among a mix of prospective and first year college students from ages 16-40[[9]](#footnote-9), Rachel Fishman finds that the top three reasons to go to college are improved employment, making more money, and getting a good job. Over 90% of respondents affirmed at least one of these reasons.

In *A New U,* Craig documents several faster and cheaper alternatives to college[[10]](#footnote-10). Craig establishes that many of these alternative education solutions are quickly growing in both supply and demand, but it is not obvious whether the programs Craig discusses representative of the broader ecosystem of alternative learning. Prior to Craig’s writing, Bryan Caplan argues for the signaling model of postsecondary credential value[[11]](#footnote-11). On Caplan’s view, the consumer of alternative credentials faces a signal composition problem which threatens the value of the credential. Traditional credentials may do a better job of signaling things like work ethic and conformity.

Alternative education, however, may endow real skills at a better rate than traditional education. If employers can obtain better-skilled workers for lower cost, they would be expected to have some willingness to give on conformity. In addition, as alternative credentials become more widely accepted, any stigma or nonconformity costs from pursuing alternative education is expected to diminish. Additionally, prior research has yet to establish magnitudes and dynamic trends on those magnitudes for many of these important effects.

This paper explores a novel attitudinal data set on alternative credentials. This paper tests the thesis that employers will favor alternative credentials as a mechanism to identify suitable entry level employment. As a secondary interest, changes over time to the relation of interest are investigated. The structure of included survey data allows for exploration of several other interesting tertiary relations.

The first section describes the organization of the paper, the motivation, and the main thesis. The second section gives theoretical and historical context. The third section presents findings. The fourth section describes applications or use cases for findings.

* 1. **Introduction to the Theory of Alternative Education**

This second section is broken into six subsections. The first subsection gives an overview of the subsequent five sections.

Because alternative education is characterized as the negation of traditional education, the second subsection begins by conceptualizing tradition. Section 2.3 moves from theoretical conceptualization of tradition into a brief inventory of actual American history, including legislation relevant to the topic of interest. The description of traditional credentials toward the end of the third section flows naturally into a discussion on alternative credentials in the fourth section. The three subtypes of alternative education are detailed throughout the fourth section. The subtypes include alternative credentials, alternative pathways, and alternative pedagogies.

Section 2.5 synthesizes these subtypes into a discussion of alternative education and alternativeness in a general way. The fifth subsection also discusses minor results from outside of the main data set which help concretize the concept of alternativeness intended throughout the paper.

To further clarify the intuition of the thesis, Subsection 2.6 describes a game-theoretic model of dynamic norms.

**2.2 Traditions Conceptualized**

Throughout the paper, the variable of interest will be referred to in a few ways. The variable of interest is most concisely described as entry-level suitability. More completely, the variable of interest is favorability on the use of alternative credentials to qualify an entry-level candidate who is applying for a career position. Technically, and most completely, the variable of interest is a response between 1 and 10 to the question, “For many professions, alternative credentials can qualify a person for an entry-level position.” A response of 10 represents a strong agreement.

Alternative credentials fit into the broader research area on alternative education. Alternative education is defined as all education other than traditional education. Alternative education decomposes into three subtopics including alternative credentials, alternative pathways, and alternative pedagogy. Each of these alternative entities is defined by the negation of their traditional counterpart.

In service of an effective description of alternative credentials, traditions are described in this subsection. Traditions can be concisely described as intertemporal social norms. As such, traditions exist in socio-temporal space. The maximum socio-temporal space that such a tradition could occupy would be from the dawn of humankind until today, and among all humans. Tradition can be viewed on a spectrum, where some processes are relatively traditional, and the modal process among a group of comparable processes is the strictly defined traditional process, implied when the singular traditional process is referred to.

* 1. **Actual Traditions: A History of Accreditation and Student Lending in the United States**

From the vantage point just established, postsecondary accreditation is a peculiar and infant approach to learning and education. Private accrediting agencies began forming in the 1880s in the United States, and private accreditation had become a well-established element of the higher education landscape by the 1930s[[12]](#footnote-12). The G.I. Bill was signed into law in 1944[[13]](#footnote-13), and provisions of the bill boosted consumption of higher education through subsidy to military service members. The number of degrees awarded by US colleges and universities more than doubled between 1940 and 1950. The increased demand for education stimulated the formation of many new colleges, and some of these were perceived to be “of dubious quality.[[14]](#footnote-14)” The G.I. Bill was reauthorized in 1952, but this time the educational benefits it included were restricted in availability to those students enrolling at an accredited institution, and the U.S. Commissioner of Education began publishing a list of federally recognized accredited institutions.

Over time, federal recognition criteria became more elaborate. The 1992 Amendments to the Higher Education Act is a notable act in this regard. Federal lending began in a military-oriented fashion with the National Defense Education Act of 1958, but lending was expanded to the general population with the 1965 Higher Education Act and subsequent legislation[[15]](#footnote-15). As earlier noted, Roots and other scholars identify this legislative trend as essentially causal to our present student debt crisis.

This brief history indicates that federal postsecondary accreditation is not only new as a human institution, but also new within the much more limited context of United States history. It’s true that market-driven accreditation has existed since the 1880s, and therefore may be considered a traditional process in United States education, but it is not true that the federal accreditation process which exists today has been around through most of American history. In this sense, federal accreditation is both causal in our present debt crisis and decidedly nontraditional.

The point of this exercise is both to familiarize the reader with a bit of relevant history, and to initiate conceptualization of traditional education as a special case of alternative education, rather than something altogether different. The traditional education of today was itself an alternative form of education at some point in time, and it remains a minority approach to education within a variety of nontrivial timeframes.

Caplan rightly argues that part of the signal of a traditional degree is to signal conformity, but throughout most of history it would be the nonconformist who possesses the thing we now call a traditional degree. Given this prior information, it becomes more plausible that society might one day return to such a situation. Obtaining a federally accredited undergraduate degree is a rather new practice, although we call it a tradition, and it has always been dubiously socially beneficial.

Traditional education is loosely synonymous with accredited education in the United States, but there are important technical differences. Accredited credentials in the context of the US include the high school diploma, the accredited undergraduate degree, and accredited graduate education. While graduate education is accredited, it is also excluded from the concept of traditional education. While tradition indicates a normal activity, graduate education is unusual. About 9% of U.S. adults had a graduate degree in 2000, and about 13% had such a degree as of 2018[[16]](#footnote-16).

In fact, it’s not technically traditional to get a college degree. Technically speaking, the American tradition is to enroll in college degree and never graduate. The history of factors leading to higher enrollment in higher education in the United States, was previously discussed, but it’s an important historical watermark to notice that 51% of Americans immediately enrolled in college after high school completion beginning in 1975[[17]](#footnote-17). Between 1975 and 2011, the immediate college enrollment rate increased from 51 percent to 68 percent. Immediate transition to college plateaued after the turn of the century. The immediate college enrollment rates for 4-year and for 2-year colleges in 2016 were not measurably different from 2000[[18]](#footnote-18).

Enrolling in college has been a tradition since 1975, but obtaining a degree never was a tradition in the same way. The fact that the trend on immediate enrollment has slowed from a positive trend into a plateau, which has now remained stably flat for more than a decade, casts doubt on the plausibility of a move back to a positive trend. For the foreseeable future, the expected trend on immediate enrollment is between flat and the possibility of a small decline.

In 2016, the percentage of students enrolling in college in the fall immediately following high school completion was 69.8%[[19]](#footnote-19), but in 2016 the percentage of the adult population with a bachelor’s degree or higher was 33.4%[[20]](#footnote-20) for “the first time in decades of data.” To reiterate the point, the strictly modal pattern of educational attainment would be for an American student to obtain a diploma, enroll in an accredited undergraduate degree program, and never obtain an undergraduate degree.

**2.4 Three Subtypes of Alternative Education**

While the final paragraph of the above section describes the strictly modal pattern of educational attainment in the modern United States, the pattern of enrollment plus noncompletion does not describe the state of being desired by those who enroll. The desired situation would be college graduation. As all ideas are antecedent to action, the desire to complete college is identified as more traditional than the actualization of college completion. The nuanced difference between a desire and its actualization is lost when speaking loosely, and as a result the actual four-year degree is loosely identified as a traditional credential.

Alternative education is a general term which includes alternative credentials, alternative pathways, and alternative pedagogies. Each of these alternative entities is characterized by the negation of a traditional counterpart.

Traditional pedagogy is the lecture format. K-12 education and higher education have both typically utilized this teaching method during and outside of the post-1975 period of interest, despite wide knowledge on the ineffectiveness of this approach. In 2014, for example, a meta-analysis of 225 studies found that undergraduate students in classes with traditional lectures are 1.5 times more likely to fail than students in classes that use active learning methods[[21]](#footnote-21).

A pathway is a series of actions culminating in the attainment of education or a credential. The traditional pathway always culminates in the traditional credential, but alternative pathways may also culminate in the traditional credential. For example, a student may obtain significant college credit or even complete an entire degree program through credit by examination. This competency-based pathway is importantly different compared to the traditional pathway based on the credit hour.

While it’s common for students to self-study in preparation for credit by examination, it’s also common for students to attend preparatory classes or even obtain knowledge for the purposes of testing out of one course by sitting in another traditional course. That situation could occur if a student took a course at one university, changed universities, and the credit would not transfer for the original course. Although their credit did not automatically transfer, the student might be able to test out at the second school. In cases like these, the student may have obtained a traditional credential through education using a traditional lecture-based pedagogy, and yet the pathway was not traditional.

The distinction of pathways might seem like splitting hairs in theory, but in practice alternative pathways like credit by examination, prior learning assessment, credit by portfolio, and similar processes hold immense potential as a time and cost savings mechanism for the student, while holding constant any concerns over lack of an accredited degree. To briefly illustrate, the price of a CLEP test is $89 in 2019 dollars[[22]](#footnote-22), while the average cost per credit hour at an accredited college is $594 in 2018 dollars[[23]](#footnote-23). A CLEP test may substitute for a 4-credit course[[24]](#footnote-24).

* 1. **Alternative Education Broadly Conceptualized**

Alternative education broadly encompasses all forms of formal and informal learning, but such a process space exceeds feasible study in a single paper, and frankly eludes sufficient study after combining many papers across several fields. Instead of studying alternative education holistically, researchers typically identify and studying a special case or particular implementation of alternative education.

One benefit of this approach is that the researcher may identify specific instances of alternative education which are faster, cheaper, or otherwise preferred in some way relative to traditional education, but a weakness of such an approach is that findings appear small, rare, disbursed, and ad hoc. To collect such effects into a strong case against the existing norm, a systematic approach is required which establishes alternativeness as an independent factor which can then be tested for effect.

Alternativeness can be conceptualized ordinally or cardinally. Remember that the three subtypes of alternative education are alternative credentials, alternative pathways, and alternative pedagogies. Within each of these three subtypes, solutions within a given subtype can be identified and ranked according to popularity. After ranking from most popular to n-popularity, an increase in rank number synonymously represents decreasing traditional status and increasing alternativeness.

By directly utilizing the underlying measure of popularity, a cardinal operationalization is achieved. Examples of popularity measures include number of applications, number of enrollments, expenditure toward a program, or survey-based measures of familiarity and favorability with respect to a specific program.

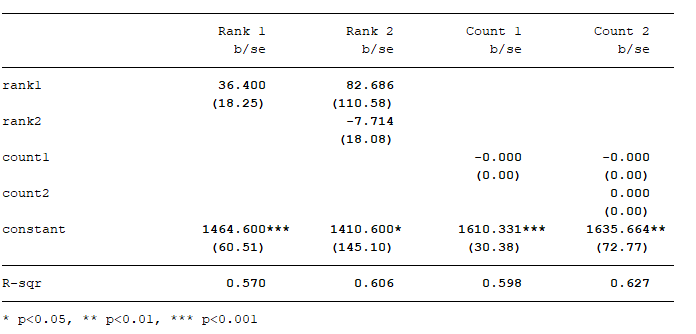
As a brief concretization, a secondary data set is investigated. The College Board, which administers the SAT, recognizes four types of high school in 2014[[25]](#footnote-25) and other years. These types include public, religiously affiliated, independent, and a group combining other and unknown types of schools. Figure 1 shows reported measures of SAT performance by type of high school, augmented with third party data for homeschoolers[[26]](#footnote-26). Table 1 shows basic model results for cardinal and ordinal operationalizations, with linear and marginal effects in their expected directions. Low significance is attributable to small sample size. Notice the non-trivial R-square values identified despite the small sample size.

Other research indicates that charter schools[[27]](#footnote-27) perform modestly better than public schools when standardizing by SAT score, although nationally representative charter school data could not be found, and gains vary importantly by state and other factors.

**Figure 1 – Summary SAT Score by School Type**



**Table 1 – Summary Models of SAT Score by Alternativeness**



**2.6 A Game-Theoretic Model of Dynamic Norms**

It’s expected and intuitive that rank alternativeness would have a positive linear and negative marginal effect. Traditions are a kind of durable norm or institution. It’s a foundational lesson of New Institutional Economics that norms, institutions, and other classes of informal rules are self-sustaining and socially valued[[28]](#footnote-28). If alternativeness continued to move in a positive direction ad infinitum, this would seem to indicate that traditions are perfectly opposed to maximal social value. That would be a jarring result which would fly in the face of much of mainline economics. Instead, the observed positive linear and negative marginal effects collectively indicate something much more compatible with orthodox economics. The indication is that some of tradition’s near neighbors represent an improvement, but continuing into the deeply alternative eventually detracts from value.

Education fits a non-special case of norms models. As a completely standard example, Conley and Neilson use a prisoner’s dilemma to demonstrate equilibrium adoption of social norms[[29]](#footnote-29). Suppose we modify this approach to account for dynamic technical improvement. In the present approach, consider an infinitely repeated prisoner’s dilemma where each round adds an additional option to choose cooperateN. CooperateN pays off (1 + cooperateN-1), and in the first round the participants are known to choose cooperate, because they have already equilibrated on the cooperate choice as a social norm. For the sake of modelling, also suppose there is a defectN added in each round as well, and it pays off (defectN-1 – 1), although it’s immediately obvious that coordination on such defects never obtains.

Alternative credentials include both technological improvements, and ostensibly technological degradation, relative to present-day norms, but according to the above game-theoretic representation, it’s not expected for society to equilibrate on any of the technologically degraded choices. Instead, it’s observed in the model that society will tend to adopt those preferred alternatives as they become available over time.

In a more complex model, suppose that instead of both players gaining certain knowledge of the new cooperate option, each player had some probability of knowledge of the new cooperate option and some level of risk aversion. It’s now seen that there is some delay in adoption of the new cooperate choice, and in some rounds one or both players may prefer to remain on the prior cooperate space, but eventually all players tend toward the highest value cooperate choice.

In a third model of highest complexity, suppose that two new cooperate choices are added each round instead of a single choice each round, but players only probabilistically know about the new choices. The first new cooperate choice is revealed to both players with 99% probability, and the second cooperate choice has a payoff which is larger by one unit, but it is revealed to each player with a probability of 50%. Given standard models of nonlinear risk aversion, players will coordinate on the choice which is revealed with near certainty.

This model clarifies risk aversion as a powerful mechanism for the incremental transition of norms from tradition toward alternatives. I propose that additional unmodeled mechanisms exist in the real world, but that the real-world trend nevertheless moves in the modeled direction. One example of an unmodeled consideration is that when an individual consumes alternative education in the real world, the payoff might be smaller than the traditional payoff.

1. **Findings**

Previous research found student indifference toward debt[[30]](#footnote-30) on the part of undergraduate students. The present paper replicates and extends such findings by identifying generalized youth antagonism to alternative credentials. The young people I surveyed include young people both within and without college, meaning it is a genuine youth effect and not simply the observation of selection bias among those undergraduates who have already selected into college education and the associated debt. Contrary to the stereotype of the innovative youth against the in-their-ways elderly, my research indicates alternative credentials are better marketed to the elderly. Plausible reasons include the fact that those with a college degree realize how little they obtained in the way of skills and career or life success attributable to that degree, while the youth realize a combination of risk aversion, lack of skin in the game, and a longer time horizon for repayment. Parents of college aged children may think twice before spending such a large chunk of change. Grandparents and older generations may remember a time when such a credential wasn’t needed, and society seemed to work quite well.

1. **Applications**

There are several important microeconomic applications of the present research. Key applications include individual application during the interview process, individual application in the context of corporate politics, firm application in competitive analysis, and individual application while facing the education consumption decision.

During the application process, an individual who has received alternative education should bear in mind the preferred model of alternative education favorability. The employment candidate will have opportunities to observe interviewers who will interview on behalf of the employer and contribute to an employment decision. The candidate can strategically communicate their educational history by observing interviewers and roughly calculating their favorability to alternative education.

In the context of corporate politics, an individual may already be employed and may be seeking to garner consensus within the organization for a policy change. An example of a desired policy change might be to eliminate the requirement for a traditional degree from certain job requisitions, or to allow specific alternative credentials to substitute for that requirement in some cases. Many corporations offer thousands of dollars per employee in tuition assistance. A second example of a desired policy change might be to modify tuition assistance to target CLEP testing, so that recipients would be able to more quickly and cheaply obtain college credit, and potentially reduce assistance outlays from the employer. Bearing in mind the preferred model might assist a change advocate in identifying those individuals best predisposed to agreement with the change, facilitating consensus building and execution of that change.

For both above scenarios, a key rhetorical strategy is to ask a person about whether they are familiar with alternative credentials. If they are not, talk a bit about them. After ensuring the concept is familiar, proceed to ask whether the person thinks these will soon become conventional. This is a key non-observable factor which is extremely explanatory in the model, but when asked in conversation it comes across in a non-technical, comfortable way. Handled properly, this question can be a good ice breaker and help the person asking the question to understand their audience without giving away the views of the person asking the question. The findings in the present paper indicate that people are receptive to alternative credentials even if they aren’t familiar with the topic, and that they become more favorable as they learn more[[31]](#footnote-31). Outside of formal processes, these positive effects may indicate that conversation around alternative credentials is generally positive, and it might be applicable as ordinary leisure conversation material, which might eventually contribute to wider social acceptance by word of mouth.

Regarding competitive analysis from the firm perspective, particularly in the case of labor competition, firms already know that alternative education is important. People often learn about alternative learning providers through their employer. This is reflected in the findings from the present research in that unemployed status has a highly significant association with lack of knowledge about alternative learning providers[[32]](#footnote-32). While employers are already driving alternative learning adoption, this kind of learning is typically used as a layer of professional learning, upskilling, or continuous education on top of a prior traditional degree.

The competitive trend is the tendency to allow that learning to substitute for the degree. This improvement to the prior human resource process allows access to a larger pool of qualified candidates who tend to accept offers at lower salary. Google was in early on this trend. In 2013, Laszlo Bock, Senior Vice President at Google, was interviewed by Adam Bryant of The New York Times. He stated that Google’s data at that time indicated that on the job performance was insignificantly related to GPA or test scores after 2-3 years, and the proportion of people without any college education at Google was increased over time[[33]](#footnote-33). Years later, in 2018, a well-known salary aggregator called Glassdoor reported on 15 major companies, including Google, which no longer required a degree[[34]](#footnote-34). Glassdoor stated, “Increasingly, there are many companies offering well-paying jobs to those with non-traditional education or a high-school diploma.”

Alternative learning providers are also a key approach to improving workforce diversity[[35]](#footnote-35). In order to align with other industry-leading firms, drive down labor cost, and improve workforce diversity, the present findings suggest a best practice policy is to marginally reduce traditional educational requirements in as many professional positions as feasible for a given firm.

Facing the education consumption decision includes at least two sub-scenarios. In one scenario the consumer is the student, and in another scenario the consumer is financing a third-party student. Typically, a financier would be a parent paying for their child to receive additional education, but there are many non-parental cases of third-party financing. Employers are a key example of non-parental education financing.

The important takeaway from the findings for individuals facing education consumption choices is that most people are favorable to the idea that alternative credentials

1. <https://heinonline.org/HOL/LandingPage?handle=hein.journals/swulr29&div=22&id=&page=&t=1556581085> [↑](#footnote-ref-1)
2. <https://www.sciencedirect.com/science/article/abs/pii/0272775788900751> [↑](#footnote-ref-2)
3. <https://eric.ed.gov/?id=EJ198251> [↑](#footnote-ref-3)
4. <https://www.forbes.com/sites/zackfriedman/2019/02/25/student-loan-debt-statistics-2019/#5a7501b9133f> [↑](#footnote-ref-4)
5. A recommended example: Caplan, Bryan. *The case against education: Why the education system is a waste of time and money*. Princeton University Press, 2018. [↑](#footnote-ref-5)
6. This represents a price increase from $11,862 to $21,222 in constant 2016 dollars. This price includes tuition and fees and room and board rates charged for full-time students in degree-granting postsecondary institutions. <https://nces.ed.gov/programs/digest/d17/tables/dt17_330.10.asp> [↑](#footnote-ref-6)
7. This represents an increase from $8,654 to $11,011 in constant 2014 dollars. <https://nces.ed.gov/programs/digest/d15/tables/dt15_236.15.asp> [↑](#footnote-ref-7)
8. From 1989 to 2012, a decrease of $4,385 from $49,487 to $45,102 in constant 2016 dollars is observed. (4385/49487) = .089. From 1960 to 2012 an increase from $47,442 to $50,219 is observed. <https://www.naceweb.org/job-market/compensation/salary-trends-through-salary-survey-a-historical-perspective-on-starting-salaries-for-new-college-graduates/> [↑](#footnote-ref-8)
9. Rachel Fishman, “College Decisions Survey: Deciding to Go to College,” New America Foundation, May 28, 2015, https:// [www.newamerica.org/education-policy/edcentral/collegedecisions](http://www.newamerica.org/education-policy/edcentral/collegedecisions) [↑](#footnote-ref-9)
10. <https://www.amazon.com/New-Faster-Cheaper-Alternatives-College/dp/1946885479> [↑](#footnote-ref-10)
11. Caplan, Bryan. *The case against education: Why the education system is a waste of time and money*. Princeton University Press, 2018. [↑](#footnote-ref-11)
12. <http://www.acics.org/accreditation/content.aspx?id=2258> [↑](#footnote-ref-12)
13. <https://www.ourdocuments.gov/doc.php?flash=false&doc=76> [↑](#footnote-ref-13)
14. <https://www.chea.org/recognition-accreditation-organizations> [↑](#footnote-ref-14)
15. <https://www.luminafoundation.org/looking-back-to-move-forward-1> [↑](#footnote-ref-15)
16. <https://www.census.gov/library/stories/2019/02/number-of-people-with-masters-and-phd-degrees-double-since-2000.html> [↑](#footnote-ref-16)
17. <https://nces.ed.gov/programs/coe/pdf/Indicator_CPA/coe_cpa_2013_01.pdf> [↑](#footnote-ref-17)
18. <https://nces.ed.gov/fastfacts/display.asp?id=51> [↑](#footnote-ref-18)
19. <https://nces.ed.gov/fastfacts/display.asp?id=372> [↑](#footnote-ref-19)
20. <https://www.census.gov/newsroom/press-releases/2017/cb17-51.html> [↑](#footnote-ref-20)
21. <https://www.pnas.org/content/111/23/8410> [↑](#footnote-ref-21)
22. <https://clep.collegeboard.org/register> [↑](#footnote-ref-22)
23. <https://studentloanhero.com/featured/cost-per-credit-hour-study/> [↑](#footnote-ref-23)
24. Credit may vary and is generally decided by the awarding institution rather than the exam provider. Some CLEP tests are offered at other price points. CLEP tests are a specific product provided by The College Board and other providers may charge different prices. Other exams widely recognized for credit by examination include AP, Cambridge International, DSST, Excelsior College, and TECEP exams. [↑](#footnote-ref-24)
25. <https://secure-media.collegeboard.org/digitalServices/pdf/sat/TotalGroup-2014.pdf> [↑](#footnote-ref-25)
26. <https://hslda.org/content/docs/news/2016/201606240.asp> [↑](#footnote-ref-26)
27. Di Carlo, Matthew. "The Evidence on Charter Schools and Test Scores. Policy Brief." *Albert Shanker Institute* (2011). [↑](#footnote-ref-27)
28. Dequech, David. "Institutions and norms in institutional economics and sociology." *Journal of Economic Issues* 40.2 (2006): 473-481. [↑](#footnote-ref-28)
29. Conley, John P., and William Neilson. "Endogenous games and equilibrium adoption of social norms and ethical constraints." *Games and Economic Behavior* 66.2 (2009): 761-774. [↑](#footnote-ref-29)
30. <https://www.sciencedirect.com/science/article/abs/pii/0167487096800146> [↑](#footnote-ref-30)
31. Technically, `reg voi cprovider1` indicates that when a person doesn’t know of any alternative learning providers, there is still a constant of 6.4 in the simple linear regression, indicating positive favorability to the variable of interest. In addition, cprovider1 itself has a significant, positive effect, indicating that informing a person about an alternative learning provider is expected to have a positive impact to the variable of interest, which is alternative credential favorability. [↑](#footnote-ref-31)
32. Technically, `reg cprovider1 isunemployed` identifies a linear effect of unemployed status on learning providers knowledge with a p-value of about 0.000 and a considerable magnitude of -.6. [↑](#footnote-ref-32)
33. <https://www.nytimes.com/2013/06/20/business/in-head-hunting-big-data-may-not-be-such-a-big-deal.html> [↑](#footnote-ref-33)
34. <https://www.glassdoor.com/blog/no-degree-required/> [↑](#footnote-ref-34)
35. <https://www.cio.com/article/3250634/want-a-more-diverse-workforce-hire-bootcamp-graduates.html> [↑](#footnote-ref-35)