



Saving the Associate of Arts Degree

HOW AN A.A. DEGREE CAN BECOME A
BETTER PATH TO LABOR MARKET SUCCESS

MARK SCHNEIDER AND MATTHEW SIGELMAN

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A M E R I C A N E N T E R P R I S E I N S T I T U T E

Executive Summary

Every year hundreds of thousands of students earn an associate of arts (A.A.) degree from community colleges in the United States. Most graduates intend to use the degree as a stepping-stone to a bachelor's degree. As a result, most A.A. degree programs focus more on general education than developing marketable skills. Unfortunately, many A.A. students never earn a bachelor's degree. Without this higher-level degree and without high-value, marketable skills, A.A. degree holders experience a wage penalty compared to their peers completing career and technically oriented associate degrees and, as we show below, compared to what employers are willing to pay better-skilled workers.

In this paper, we explore how to increase the A.A. degree's labor market value and the likelihood that A.A. graduates can earn family-sustaining wages. We do this by first identifying a set of career areas and corresponding occupations in which:

- Graduates of A.A. degree programs typically have many of the skills required for that occupation;
- Employers demonstrate a willingness to accept an associate-level credential; and
- The gap between the required skills and the skills students may develop in their degree can be bridged through incremental training.

Through an analysis of the job postings in Burning Glass Technologies' proprietary database that fit these criteria, we then identify the skills students need to compete more successfully for jobs in these occupations. We also discuss mechanisms by which students and colleges can build on our analysis to improve the value of the A.A. degree. These include:

- Using guided pathways to increase the likelihood of successfully transferring from the A.A. to a bachelor's program;
- Identifying the marketable skills that are most in demand in local labor markets—and communicating that information to students;
- Embedding these marketable skills in the curricula of A.A. programs; and
- Establishing strong ties with local employers, both to increase awareness of needed skills and to provide avenues for students into employment.

Many colleges already do one or more of these. But a more systematic approach to improving the market value of the A.A. degree is necessary.

Saving the Associate of Arts Degree

HOW AN A.A. DEGREE CAN BECOME A BETTER PATH TO LABOR MARKET SUCCESS

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According to current federal data, community colleges awarded over 670,000 associate degrees during the 2014–15 academic year.¹ Some of these associate degrees are technically oriented, directly preparing students for careers in fields such as information technology, manufacturing, and health services.

But, as shown in Table 1, roughly 289,000 (over 40 percent) of associate degrees awarded by community colleges were in a single field of study: liberal arts, general studies, and humanities. Another roughly 100,000 degrees were awarded in related liberal arts or transfer-oriented programs including multi/interdisciplinary studies; area, ethnic, cultural, gender, and group studies; social sciences and history; and visual and performing arts. **In total, over half of associate degrees are likely oriented toward transferring to a four-year degree program.**

Associate of arts (A.A.) degrees are generally designed to be stepping-stones to a bachelor's degree. When the process works, A.A. degrees permit students to receive two years of education at a relatively inexpensive community college and then transfer to a four-year school to complete a bachelor's degree.

In theory, the transfer process can save students a significant amount of money. According to the College Board, in 2016–17 the average full-time student at a public two-year college must cover about \$7,560 in net tuition, books, fees, and living expenses (i.e., how much a student pays after financial aid awards).²

At the same time, the average full-time, in-state student at a public four-year institution pays \$14,210 per year. Thus, a student who attends a community college for two years and then transfers to a bachelor's degree program can save, on average, around \$13,000. As attractive as this transfer mechanism may be, the ideal of a seamless, **lower-cost pathway from an A.A. degree to a bachelor's degree plays out far too infrequently.**

Falling Short on the Road to a Bachelor's Degree

Consider data drawn from the federal government's nationally representative Beginning Postsecondary Students Longitudinal Study (BPS).³ BPS tracked students who first began their higher education in 2003. Six years later, only 14 percent of students originally enrolled in an associate degree program in either the liberal arts or transfer track had completed a bachelor's degree. Another 21 percent were still enrolled in higher education. **Fully 45 percent had no degree and were not enrolled in any postsecondary institution.**⁴

A more recent study from the National Student Clearinghouse (NSC) focused on a later cohort of postsecondary entrants from 2010. Just like the findings from BPS, NSC unearthed lackluster student

Table 1. Number of Associate Degrees Awarded in Liberal Arts or Transfer-Oriented Programs, 2014–15

Program of Study	Number of Completers
Area, Ethnic, Cultural, Gender, and Group Studies	284
Communication, Journalism, and Related Programs	5,271
Communications Technologies/Technicians and Support Services	3,015
Education	12,735
English Language and Literature/Letters	2,009
Family and Consumer Sciences/Human Sciences	7,636
Foreign Languages, Literatures, and Linguistics	1,909
Legal Professions and Studies	4,920
Liberal Arts and Sciences/General Studies and Humanities	268,978
Multi/Interdisciplinary Studies	25,508
Parks, Recreation, Leisure, and Fitness Studies	3,051
Philosophy and Religious Studies	170
Social Sciences	17,505
Visual and Performing Arts	12,329
Total	365,320

Source: US Department of Education, Integrated Postsecondary Data System, “Certificates Below the Associate’s Degree Level and Associate’s Degrees Conferred by Public 2-Year Postsecondary Institutions, by Length of Curriculum, Sex of Student, and Discipline Division: 2014–15,” https://nces.ed.gov/programs/digest/d16/tables/dt16_321.12.asp.

outcomes: Of all the students who started at a community college, only 9 percent had completed a degree at a four-year institution six years later. And although 16 percent were still enrolled in postsecondary education, many of these remaining students will likely fail to earn any credential, let alone a bachelor’s degree.⁵

No matter how one views these findings, there is a completion problem, especially since BPS data also show that more than 80 percent of the incoming 2003 cohort⁶ pursuing an associate degree intended to earn a bachelor’s degree or above.⁷ Given how often the transfer mechanism fails, the A.A. degree is effectively a terminal degree for a large swath of students.

A question naturally follows: How well does the A.A. degree position graduates for success in the labor market?

Falling Short on the Road to High Wages

Unfortunately, just as completion data show that the A.A. degree frequently falls short as a pathway to a bachelor’s degree, labor market data show that the degree also falls short as a pathway to good wages.

To be clear, students who complete an A.A. degree earn on average more than a high school graduate⁸—so it is not that the degree has *no* value. Rather, we show that far too often A.A. degree holders fare poorly compared to either graduates who are completing an associate degree in a technical field or what they could earn had they mastered more marketable skills during their course of study in the liberal arts.

It is hard to estimate precisely the lost wages linked to the absence of marketable skills for students completing A.A. degrees.⁹ Later in this paper, we turn to patterns gleaned from analysis of job postings by Burning Glass Technologies as a way to estimate this



Table 2. Median Earnings of Graduates with Associate Degrees Five Years After Completion, by Selected State

Florida	Associate in Arts	\$38,800
	Associate in Science	\$53,400
	Associate in Applied Science	\$46,300
Minnesota	Liberal Arts and Sciences, General Studies, and Humanities	\$37,800
	Other Fields of Study	\$44,400
Tennessee	Liberal Arts and Sciences, General Studies, and Humanities	\$37,800
	Other Fields of Study	\$47,000
Texas	Academic Associate	\$39,400
	Other Fields of Study	\$56,300
Virginia	Associate Degree (Bachelor's Credit)	\$33,000
	Associate Degree (Occupational/Technical Credit)	\$42,200

Note: Data include students who completed an associate degree from an in-state, public institution and who are found in a state's unemployment insurance wage database five years postgraduation. The states shown here are among the states for which College Measures has data. See the Appendix for a full explanation of data and methodology.

Source: College Measures, 2016.

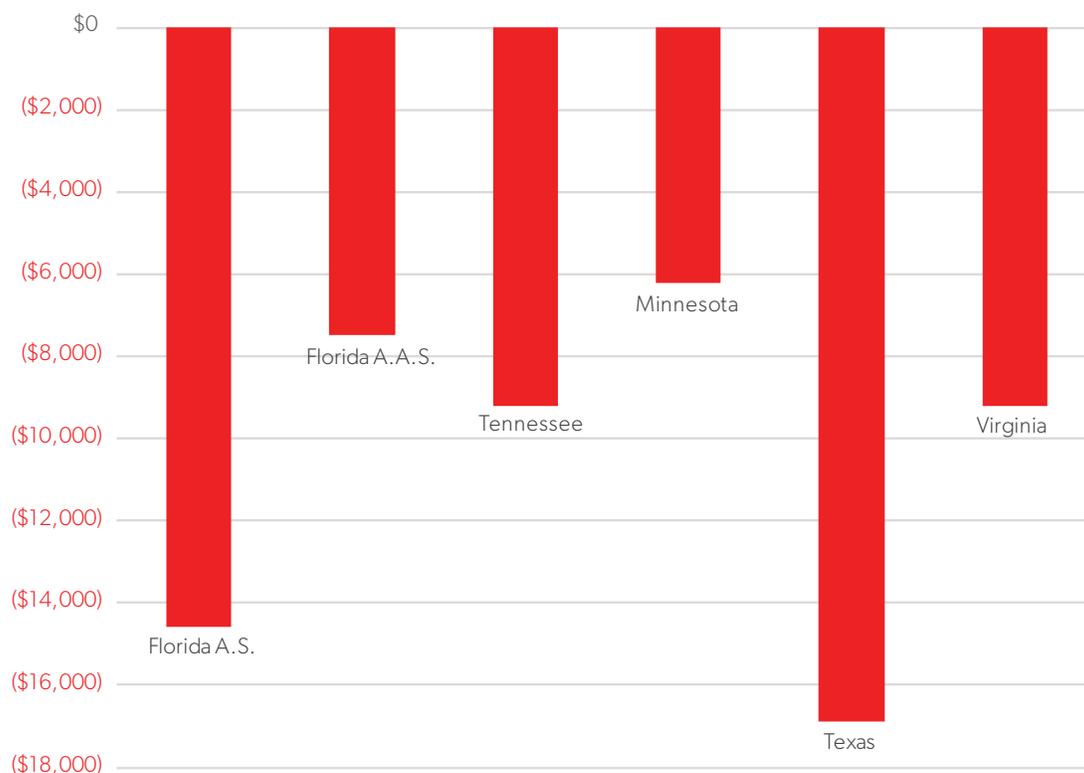
wage penalty (i.e., the difference in median earnings of A.A. graduates as compared to graduates with associate degrees in other fields). But first we turn to administrative data on postcollege earnings from five states.¹⁰

In Table 2, we compare the earnings of graduates with A.A. degrees to those of graduates with associate degrees in other fields. While nomenclature varies across the states, the first line for each state entry represents the median wages five years post-completion for liberal arts or transfer-oriented A.A. degree holders. The subsequent data in the table report the wages for graduates with other types of associate degrees. Most of these are in applied fields such health professions, business, computer/information sciences, and engineering technologies.

Figure 1 highlights the magnitude of the wage penalty, which ranges from around \$6,600 per year in Minnesota to almost \$17,000 in Texas—with A.A. graduates

always on the losing end. There is clearly a wage penalty for being in the labor market with a terminal A.A. degree compared to other associate degrees.

Other research confirms that the sub-baccalaureate major has differential effects on earnings, even after controlling for students' different attributes. Researchers Mina Dadgar and Madeline Joy Trimble examine returns by field of study in the state of Washington, finding that graduates with associate degrees in STEM, nursing, and construction earned a significant payoff compared to those with associate degrees in humanities.¹¹ Another study from the Community College Research Center at Columbia University found that the net gains of attaining an associate degree from a community college are more than \$80,000 in present value over 20 years.¹² **The study also summarizes evidence that shows that associate degrees in sciences, which are occupationally focused, boast higher returns than those of A.A. degrees.**

Figure 1. Wage Penalty for A.A. Degree Holders by Fifth-Year Earnings, by Selected State

Note: The “wage penalty” is the difference between the fifth-year median earnings for graduates with A.A. degrees and graduates with other, usually technical or career-oriented, associate degrees. Data include students who completed an associate degree from an in-state, public institution and who are found in a state’s unemployment insurance wage database five years postgraduation. The states shown here are among the states for which College Measures has data. See the Appendix for a more detailed explanation of data and methodology.

Source: College Measures, 2016.

The Underlying Problem

When we couple the information on earnings with information on degree completion identified earlier, the underlying problem with the A.A. degree comes into focus.

First, the A.A. degree is designed as a stepping-stone to a bachelor’s degree. However, only a fraction of enrollees actually completes that path, leaving the A.A. as the terminal degree with which most of them compete in the job market.

Second, since the A.A. degree is designed as a transfer degree, it is not intended to help students develop marketable skills. Without a bachelor’s degree or

high-value, marketable skills, A.A. degree holders experience a wage penalty compared to their peers completing career and technically oriented associate degrees and, as we show below, compared to what employers are willing to pay for better-skilled workers.

If this is a low-value degree earned by hundreds of thousands of students each year, how can we improve it? Can we identify skills that could complement students’ courses of study or that institutions could incorporate into their programs to make the A.A. degree a higher-value pathway into the labor force?

Table 3. Job Roles, Average Salaries, and Job Postings by Career Area for A.A. Graduates

Career Area	Design	Health Care	Human Resources	Marketing and Communications	Sales
Job Roles	User Experience Designer, Interior Designer, Graphic Designer	Clinical Coordinator, Behavioral Counselor, Health Educator	Labor Relations Specialist, Human Resources Associate, Resource Coordinator	Social Media Specialist, Marketing Coordinator, Public Relations Specialist	Business Development Manager, Technical Sales Representative, Sales Associate
Average Advertised Salary for A.A. Graduate	\$48,900	\$45,600	\$44,300	\$41,300	\$43,000
Average Advertised Salary for A.S. Graduate	\$57,200	\$51,500	\$44,200	\$45,200	\$54,600
Number of Postings for A.A. Graduate	973	1,341	465	983	5,141
Number of Postings for A.S. Graduate	3,648	12,965	20,358	7,949	167,923

Note: "A.S." means associate of science degree. Salary data come from advertised job postings from the Burning Glass database. The number of job postings listed are only a subset of all postings for A.A. degree holders and should be thought as "opportunity jobs"—jobs an A.A. graduate could attain with additional, incremental training—as determined by the criteria listed in the Appendix. The total number of postings for A.A. graduates is estimated based on the criteria also explained in the Appendix and is larger than the sum of jobs displayed here.

Source: Authors' calculations using data from Burning Glass Technologies, 2016.

Defining the Potential Job Market Value

To understand how to increase the market value of the A.A. degree, we first analyzed a sample of more than 32,000 job postings potentially open to graduates with this specific credential to understand the skills these jobs require and the salaries they pay.¹³ We then compared the jobs and salaries potentially available to those with A.A. degrees with the jobs and salaries in the *same* career areas and job roles for graduates with associate in science degrees—for which there are more than 500,000 job postings.

In this analysis, we focus on a set of career areas and occupations in which:

- Graduates of A.A. degree programs typically have many of the skills required for that occupation,
- Employers demonstrate a willingness to accept an associate-level credential, and
- **The gap between the required skills and the skills students may develop in their degree is addressable through incremental training.**

Through analyzing the job postings in Burning Glass Technologies' proprietary database that fit these criteria, we identified the skills students need to more successfully compete for jobs in these occupations.

We begin by identifying a range of job roles that could be appropriate for those with an A.A. degree. These include new and emerging roles, such as social media or digital content specialist; art-related jobs, such as interior designer or user experience designer; corporate roles, such as labor relations specialist or human resources associate; and even roles in the more specialized health care industry, such as counseling (specifically unlicensed positions) and health coaches.

These roles were selected primarily based on their skills alignment with the typical course of study in an A.A. degree program. They are further validated based on the credentials employers advertise in job postings. See the Appendix for a full description of the methods by which we selected these career areas and job roles.

As evident in Table 3 (and consistent with the state-level earnings data in Table 2), both the salary and the level of demand are significantly higher for the more skills-oriented associate of science degrees than for A.A. degrees. Note that the demand for the associate of science graduates in the career areas identified in Table 3 includes over 200,000 specific job entries—26 times higher than the demand employers indicated for A.A. graduates. Not surprisingly, given the greater demand, the advertised salary for associate of science graduates was about 20 percent higher.

The data gleaned from our analysis of the job postings in the Burning Glass database highlight another way A.A. graduates are leaving money on the table. Recall that, from the state-level earnings data presented in Table 2, the median earnings for A.A. degree holders never exceeds \$40,000. Yet, in our sample of job postings for which employers might be open to hiring a graduate with a two-year degree, the wage employers are willing to pay averages \$44,000 across those five career areas—a \$4,000 premium at minimum as compared to the College Measures earnings for A.A. degree holders across states.

These earnings differentials suggest that current graduates lack the skills that employers need and that these graduates are not adequately filling the roles that they could be filling if they had skills that match

better what employers need. And as evident in both the state and national job-posting data, these graduates are being paid far less than they could be paid with the right skills—but what are those skills?

What Are the Top Skills for Jobs for Which A.A. Graduates Could Otherwise Be Eligible?

By mining the sampled data set of those job postings potentially open to those with A.A. degrees, we are able to identify the skills that could enable A.A. degree earners to advance in those five career areas. Consider Table 4, where we organize the results of parsing job postings into the same five career areas as Table 3. Under each career area, we identify the top 10 skills that employers most frequently asked for in job postings (that also require A.A. degrees).

Note that many of the skills in high demand, such as communication, writing, or problem-solving, are skills that *should* be at the core of what a liberal arts education has to offer. Other skills (e.g., Adobe Photoshop and JavaScript) may not be at the core of current A.A. curricula, but students could feasibly master them via electives or through certificates or certifications that could be part of their course of study.

How Can an A.A. Degree Become a Better Path to Labor Market Success?

Each year, hundreds of thousands of graduates enter the job market with the A.A. degree as their terminal credential. Because many lack the skills that employers need, these students are paid thousands of dollars less than what they could earn with more marketable skills. With this in mind, we outline below some ideas and strategies that could improve the return on the investment associated with the A.A. degree for students, families, and taxpayers.

Add the Right Credential or Avoid the A.A. Altogether. Despite the best intentions of both students and community college programs, the bulk of



Table 4. Skills in Five Career Areas A.A. Graduates Could Add

Career Area	Design	Health Care	Human Resources	Marketing and Communications	Sales
Top Skills	<ul style="list-style-type: none"> • Adobe Photoshop • Creativity • Graphic Design • Communication Skills • Teamwork/ Collaboration • Website Design • JavaScript • Research • Detail-Oriented • Writing 	<ul style="list-style-type: none"> • Communication Skills • Writing • Supervisory Skills • Budgeting • Planning • Patient Care • Mental Health Counseling • Teamwork/ Collaboration • Staff Management Scheduling 	<ul style="list-style-type: none"> • Communication Skills • Microsoft Excel • Writing • Microsoft Office • Employee Relations • Organizational Skills • Detail-Oriented • Problem Solving • Planning • Human Resources Information System 	<ul style="list-style-type: none"> • Marketing • Communication Skills • Writing • Creativity • Teamwork/ Collaboration • Social Media • Organizational Skills • Project Management • Microsoft Excel • Budgeting 	<ul style="list-style-type: none"> • Sales • Communication Skills • Customer Service • Retail Industry Experience • Writing • Store Management • Merchandising • Organizational Skills • Sales Goals • Sales Management

Note: Top 10 skills most frequently requested by employers, by career area, based on job postings that require A.A. degrees. Source: Authors’ calculations using data from Burning Glass Technologies, 2016.

graduates of A.A. degree programs will not complete a bachelor’s degree, leaving them in the labor market limbo we have described. **Given this reality, students should be informed about alternatives that could lead to better labor market outcomes.**

For some students, this might mean that starting directly in a bachelor’s degree program (rather than starting in a two-year program and transferring) can actually be more cost-effective.¹⁴ But for the many students who do not have the time, resources, or inclination to enter directly into a bachelor’s program, they should know about the sub-baccalaureate credentials that could lead to better labor market outcomes. **Fundamentally, students need to understand that skills, not degrees, are increasingly mattering more and more in the labor market.**¹⁵

Given this new reality, students should explore the range of skills-based credentials that can produce good

jobs with family-sustaining wages. This could include associate of science degrees, career-focused certificate programs, **industry-recognized credentials**  apprenticeships.¹⁶ Many of these credentials are already offered by community colleges—and could be embedded in existing A.A. programs to potentially increase job opportunities and corresponding wages for students.¹⁷

Align Skills with Labor Market Needs. If students continue on the A.A. track, they must understand that if they fail to complete a bachelor’s degree then they likely will face an uphill battle in the job market. These students will have earned degrees that hold relatively low value in the eyes of potential employers. As such, students need to distinguish themselves based on the skills they have acquired.

To get hired for the higher-value jobs that are potentially open to graduates with A.A. degrees,

students need to acquire skills in the following categories.

Coding and Knowledge of Occupation-Specific Software. Coding skills are in high demand, and jobs that require coding skills pay on average a 35 percent premium compared to jobs that do not.¹⁸ In addition, there is high demand for skills related to the use of specific software packages. For example, a recent Burning Glass report analyzed the demand for knowledge of Salesforce, the popular customer relationship management system used to manage sales, marketing, and fundraising campaigns.¹⁹ In 2016, more than 27,000 jobs were available to community college graduates that asked for Salesforce skills. On average, these jobs pay \$64,000 per year—\$24,000 above the median salary for A.A. earners.

Management and Business-Oriented Skills. Across the board, employers struggle to find applicants who are strong managers or who have other needed business skills. More than 300,000 job postings at the sub-baccalaureate level, with an average advertised salary of \$56,000 per year, ask for skills such as project management, team management, business development, or budgeting.

Sales Skills. Sales skills are critically important to industry across a range of jobs, but there is scant attention paid to developing these skills in higher education. Students from liberal arts programs are well poised to develop sales skills by building on the communication, problem solving, and presentation skills that are part of the liberal arts core. Similarly, skills such as retail management, customer complaint resolution, or product knowledge are indicated in more than 316,000 associate-level jobs and pay an average annual salary of \$47,000—a 17.5 percent premium above the median salary for A.A. earners.

Reform A.A. Programs at Community Colleges.

We have highlighted actions that students themselves could and should take to improve their success in the labor market. Community colleges also have responsibilities to help students develop marketable skills.

This is an area where community colleges are well positioned to respond. Frequently these colleges already have closer relationships to local employers and can identify employer needs better than four-year institutions, providing an opportunity for community colleges to provide both guidance and relevant skills-oriented courses for their students.

Here are just a few of the steps community colleges could consider. To be sure, many community colleges are already on this path.²⁰

Guided Pathways to Bachelor's Degrees. Since so many students intend to graduate and transfer to a bachelor's program, community colleges need to help students complete their studies and transfer. Perhaps the most promising avenue to help students accomplish that goal was pioneered by economist Tom Bailey and colleagues from the Community College Research Center. Called “guided pathways,” it focuses student efforts on activities that increase the likelihood of graduation.²¹

Other reforms affect how developmental education is delivered, and some of these new approaches have great potential.²² Still others link community colleges more tightly with bachelor's-granting universities, easing the barriers that often derail students trying to transfer.²³ These types of reforms could help students earn their associate degree, transfer to a bachelor's degree program, and successfully cross the finish line.

Information on Student Success. Community colleges need to provide their students with more information to help them find programs that lead to family-sustaining wages. This may lead students away from liberal arts and into technical areas of study, or this information may help students understand the importance of marketable skills and lead them to seek ways to master such skills. But once students have this information about valued skills, colleges need to make it easier for students to master them.

Embedding Skills into Curricula. Community colleges could reform curricula in A.A. programs to add

elective skills-based courses or embed high-value, industry-recognized certifications into a course of study. This option is explored in numerous studies and shows great promise.

Most of this effort to date has focused on embedding marketable skills into programs that are already technically oriented. For example, Broward County Community College uses its “embedded” industry credentials to gain technical skills that signal job-readiness, hopefully making it easier to land a job with good wages.²⁴ Broward is not alone: The *Washington Monthly* recently presented a series of vignettes featuring innovative community colleges trying to increase the labor market success of their graduates through similar efforts.²⁵

Given the success of embedding certifications into technically oriented degree programs, can community colleges expand to help all students, including liberal arts ones, earn degrees and certifications simultaneously? **Even if community colleges do not embed certifications in their curriculum, they could explore embedding work or service into their curriculum.** This could take the form of an internship, an apprenticeship, or other means of increasing students’ exposure to the world of work. While many community college students already work many hours while studying, colleges could try to help match students with jobs that are more aligned with their studies.

Engaging Employers. In such work-oriented strategies, community colleges will likely need to increase their engagement and outreach to employers. While it is fairly common for community colleges to consult with local employers about their technical degree programs, the idea of employer engagement has to be extended to encompass liberal arts programs as well.

Conclusion

Clearly, for far too many students, **the A.A. degree represents a pathway not to a bachelor’s degree but to nowhere.** This reality has implications for both students and community colleges.

Since so many A.A. graduates will end up in the job market without having earned a bachelor’s degree, they need a better understanding of the connection among their programs, careers, and future earnings. **That will require them to have two critical inputs: better information on labor market demand and more transparency from educational institutions regarding educational practices and student outcomes.**

Both students and postsecondary institutions, particularly community colleges, could benefit from more information on labor market demand and student success. **Recent research has shown that many community college students have bad information about the labor market outcomes of different majors.** The same research shows that this information could be important for the choice of major.²⁶

Initiatives such as the US Department of Education’s College Scorecard represent efforts at increasing the information available to students about the outcomes of educational institutions. **However, more transparency is needed about the outcomes associated with the full spectrum of postsecondary credentials.** In particular, the College Scorecard is focused on institutional-level outcomes, not the programmatic-level results that truly matter. To that end, consumer-information initiatives such as Launch My Career aim to deliver to students more and better program-level labor market information.²⁷

Colleges need to explore more fully how they can fit highly valued skills into existing programs of study, and students still need far more information about the success of those efforts. **It seems unlikely that the A.A. will ever carry the prestige of a bachelor’s degree. That does not preclude the A.A. degree from becoming more valuable than it is today.**

To do that, colleges will need to become more attentive to the increasing premium that employers place on skills and, correspondingly, how specific skills can lead to significant improvement in career outcomes. Indeed, one of the appeals of the bachelor’s degree in the job market is that it acts as a proxy for a range of valued skills—cognitive, technical, social, and noncognitive alike.²⁸ Focusing, refining, and better communicating the skills contained in the

associate degree—and which skills may be added to it—is a promising approach to making the A.A. degree more valuable for students.

The specific skills identified earlier such as coding, sales, or social media can all be learned via short-term training programs, such as boot camps, that could be integrated into existing A.A. programs. Certifications and certificates can also be embedded in A.A. programs—many of which are housed in community colleges already—delivering high-value skills while signaling to prospective employers the mastery of those skills. Coding and IT skills already draw on a well-established set of certifications with strong value in the job market.²⁹ Adding these to an A.A. degree could raise its value considerably—thereby ensuring that even those who do not go on to complete a bachelor’s degree enjoy a positive return on their educational investment.

The truth is that the majority of graduates of A.A. degree programs, at some point and for many reasons, will find they cannot complete a bachelor’s degree. By equipping students with marketable skills aligned to the kinds of jobs that will be immediately open to them, colleges can ensure that students with A.A.

degrees achieve higher salaries and greater mobility in the job market—instead of a transfer ticket that may never be punched.

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About the Authors

Mark Schneider is a visiting scholar in education policy studies at AEI, vice president at the American Institutes for Research, and president of College Measures. **Matthew Sigelman** is the CEO of Burning Glass Technologies.

Appendix

The data used in this paper draw from state and federal surveys and administrative data sets relating to degree completion and graduates' earnings. In addition, to provide a more granular and up-to-date view of the job market, we draw from Burning Glass Technologies' database of online job postings, which provides a comprehensive view of real-time employer demand at the job, skill, and credential level.

Data from College Measures

College Measures receives wage data for graduates from each program at institutions in a state at several points in time, usually one, three, five, and 10 years after completion.

"Program" is defined by the federal government's Classification of Instructional Programs (CIP), reported for each program in each of the state's public institutions. College Measures focuses on certificate, associate degree, and bachelor's degree programs, although states often provide data on master's, doctoral, and other professional programs. Different types of degrees (e.g., associate of arts and associate of science) are also recorded.

The data come from state higher education agencies in each College Measures partner state. These higher education authorities partner with state labor agencies via data-sharing agreements and match program completers' Social Security numbers against their unemployment insurance (UI) wage records.

To protect privacy, depending on the state, multiple cohorts of graduate data may be combined. Data from small programs, those with fewer than 10 graduates—even after combining cohorts—are suppressed.

The data used here are overwhelmingly based on completers from in-state, public institutions who are matched against wage records in the state's UI wage database. In other words, these data capture wages for individuals who have completed a credential and found employment in the state. State practices vary

somewhat—for example, Florida also adds in data from the Department of Labor's Wage Record Interchange System, and Texas has some data on federal employees—but the bulk of the wage data come from the state's UI data.

Some states also have data on private institutions (e.g., Virginia has excellent data on almost all the not-for-profit institutions in the state; Minnesota on both proprietary and not-for-profit institutions), but all states have extensive data on their public institutions, which educate most students. The data on private schools can be found, when available, on the state-specific websites.

Students are assigned to the highest-level degree they have earned. For example, a student who has an associate degree and then successfully transfers and completes a bachelor's degree will be in the bachelor's degree cohort—and the contribution the associate degree may have made to that student's success is not recorded. Students with dual majors on the same degree level are assigned to their first choice as indicated in student-level data gathered by institutions. No students are in the database twice.

These data have limits. For example, in general the data do not capture students who enrolled in a particular program but did not complete a credential or students who do not work in an industry covered by UI (e.g., contractors). The data also do not cover students who completed a particular program from an in-state, private institution or students who completed a credential but moved to or found employment in another state. But UI data cover the bulk of the civilian workforce and are administrative—not self-reported—earnings data.

Data from Burning Glass Technologies

To supplement traditional sources of labor market data with more detailed information on employer demand for jobs and skills, Burning Glass mined its

comprehensive database of over 150 million unique online job postings dating back to 2007. Burning Glass' "spidering" technology extracts information from close to 50,000 online job boards, newspapers, and employer sites on a daily basis and de-duplicates postings for the same job, whether it is posted multiple times on the same site or across multiple sites.

Burning Glass applies detailed text analytics to code and extracts granular data from job postings. This approach contextualizes each job posting and therefore can extract more relevant data than keyword-based approaches. For example, Burning Glass software distinguishes between budget analysis as a skill, a contractor who must complete jobs on-time and on-budget, and a clerk at Budget Rent a Car. Burning Glass maintains a team of analysts who constantly monitor labor market trends to identify new and emerging skills and include them in the coding rules and taxonomies.

Burning Glass' proprietary data are supplemented by additional indicators from the Bureau of Labor Statistics and other published sources.³⁰

All Burning Glass postings data in this report are based on the full data set of job postings collected in the US during the 2016 calendar year. In assessing the skills held by A.A. degree holders, and demanded in the job market, we made several choices:

- To define these graduates' potential, we presumed that the accepted curriculum leading to an associate degree reflects the skills A.A. graduates actually have.
- To measure employer preferences, we used the frequency at which employers either required or preferred an associate degree in job postings.
- To determine the relative training levels for various skills, we relied on the proprietary taxonomy of skills developed by Burning Glass. By tracking skills that usually travel together in job postings, we are able to plot "adjacencies" that identify skills that overlap or build on similar domains.

Further detail on these methodologies follows.

Skills. Skills describe the abilities and knowledge areas that workers can possess. In job postings, skill requirements can be found throughout each posting, especially in sections describing job duties and required qualifications. Individual skills can be expressed in diverse ways (e.g., Microsoft Excel versus MS Excel), and the Burning Glass team has defined a constantly growing list of skill names that serves to standardize the different variants of a skill into discrete entities, as well as a set of rules that perform that standardization.

Career Area and Occupations. Burning Glass uses the job title and supporting information about industry, employer, and skills to classify each job posting into the appropriate occupational grouping. Jobs are first classified into occupations, while a collection of similar occupations is classified as a career area. Burning Glass uses a classification system that allows widely varying job titles to be grouped into a single category, where appropriate. For example, its algorithms can recognize that the names used by different companies for retail sales associates, such as "team member," "sales associate," and "retail sales consultant," all mean the same thing.

The United States government developed the SOC/O*NET taxonomy to classify occupations for use in internal and external statistical applications—namely, surveys. It has considerable history and is used by many valuable government data sources. While useful, the SOC/O*NET taxonomy is oriented toward macroeconomic research and therefore includes at once categories that are too broad and many others that are excessively granular and reflective of out-of-date modes of work. The Burning Glass Occupational Taxonomy seeks to address the shortcomings of SOC/O*NET by merging certain O*NET occupations, breaking apart others, and incorporating emerging occupations (such as data scientists) into the taxonomy in a timely manner. This study uses Burning Glass' occupation taxonomy to ensure that the information presented reflects a modern interpretation of the labor market.

Average advertised salary is calculated from the posted salaries, or salary range, found in job postings.

Table A1. Classification of Job Postings by CIP Codes

CIP Code	CIP Title
5	Area, Ethnic, Cultural, Gender, and Group Studies
9	Communication, Journalism, and Related Programs
10	Communications Technologies Technicians and Support Services
13	Education
16	Foreign Languages, Literatures, and Linguistics
19	Family and Consumer Sciences
22	Legal Professions and Studies
23	English Language and Literature/Letters
24	Liberal Arts and Sciences, General Studies and Humanities
30	Multi/Interdisciplinary Studies
33	Citizenship Activities
36	Leisure and Recreational Activities
43	Homeland Security, Law Enforcement, Firefighting, and Related Protective Services
45	Social Sciences
50	Visual and Performing Arts
54	History

Source: National Center for Education Statistics, "What Is the CIP?," <https://nces.ed.gov/ipeds/cipcode/Default.aspx?y=55>.

Not all job postings contain salary ranges, and these posted ranges may or may not reflect what workers actually receive after hiring and salary negotiations.

Identifying Jobs for Associate Degree Holders.

We used employers' specified preferences for degrees in job postings to identify job opportunities for graduates of corresponding degree programs. We searched for the degree level and major in the job posting and

then standardized the requirement to a specific CIP code. If a job posting explicitly required an associate degree, and for a program of study that belonged to Table A1, then that job was classified as available to A.A. graduates. Similarly, if a job posting explicitly required an associate degree but not from a program of study that was included in Table A1, then that job was classified as available to associate of science graduates.

Notes

1. These are associate graduates from two-year public colleges for whom we can identify a “first” major field of study. Around one million associate degrees are awarded in the nation overall. This tally also includes students who completed associate degrees in four-year schools and private two-year institutions. See US Department of Education, National Center for Education Statistics, “Table 321.12,” July 2017, https://nces.ed.gov/programs/digest/d16/tables/dt16_321.12.asp.

2. Sandy Baum et al., *Trends in College Pricing*, College Board, 2016, https://trends.collegeboard.org/sites/default/files/2016-trends-college-pricing-web_o.pdf.

3. The BPS surveys cohorts of first-time, beginning students at three points in time: at the end of their first year and then three and six years after first starting in postsecondary education. It collects data on a variety of topics, including student demographic characteristics, school and work experiences, persistence, transfer, and degree attainment. See US Department of Education, National Center for Education Statistics, “Beginning Postsecondary Students (BPS),” <https://nces.ed.gov/surveys/bps/>.

4. See Lutz Berkner et al., “Six-Year Attainment, Persistence, Transfer, Retention, and Withdrawal Rates of Students Who Began Postsecondary Education in 2003–04,” US Department of Education, July 2011, <https://nces.ed.gov/pubs2011/2011152.pdf>.

5. Y. Hwang et al., *Completing College: A National View of Student Attainment Rates—Fall 2010 Cohort*, National Student Clearinghouse Research Center, December 2016, Table 19, <https://nscresearchcenter.org/wp-content/uploads/SignatureReport12.pdf>.

6. Harry J. Holzer, “Priorities for Federal Workforce and Higher Education Policy,” Urban Institute, September 2017, www.urban.org/sites/default/files/publication/93336/priorities-for-federal-workforce_1.pdf.

7. We can supplement this national view with more detailed data from states. In Florida, only 17 percent of graduates from liberal arts associate degree programs are continuing their education in a state university a year after graduating. In Texas, only 20 percent of students who enrolled with the intent of earning transfer credits had earned a bachelor’s degree six years later.

8. For example, see Mark Schneider, *Majors Matter: Differences in Wages over Time in Texas*, American Institutes for Research, July 2016, www.air.org/sites/default/files/downloads/report/Majors-Matter-Differences-in-Wages-Over-Time-in-Texas-July-2016.pdf; and Hamilton Project, “Lifetime Earnings by Degree Type,” April 26, 2017, www.hamiltonproject.org/charts/lifetime_earnings_by_degree_type.

9. Unfortunately, the Census Bureau does not report detailed wage data for associate graduates with different fields of study. It does, however, provide wage estimates for bachelor’s graduates in 15 different fields. As a result, we can compare the median earnings for bachelor’s graduates in, for example, science- and engineering-related fields (\$70,000) with those of a liberal arts graduate (\$58,000). See US Census Bureau, “Industry and Occupation,” www.census.gov/topics/employment/industry-occupation.html.

10. These five states have partnered with College Measures to provide detailed information about the labor market outcomes of students earning different postsecondary credentials. In addition to the data from the five states presented here, College Measures has also partnered with Arkansas, Colorado, and Rhode Island. The patterns with respect to earnings by field of study in these states are similar to the five highlighted here. See also Mark Schneider and Rooney Columbus, *Degrees of Opportunity: Lessons Learned from State-Level Data on Postsecondary Earnings Outcomes*, American Enterprise Institute, October 20, 2017, <http://www.aei.org/publication/degrees-of-opportunity-lessons-learned-from-state-level-data-on-postsecondary-earnings-outcomes/>.

11. Mina Dadgar and Madeline Joy Trimble, “Labor Market Returns to Sub-Baccalaureate Credentials: How Much Does a Community College Degree or Certificate Pay?,” *Educational Evaluation and Policy Analysis* 37, no. 4 (November 2014): 399–418, <http://journals.sagepub.com/doi/abs/10.3102/0162373714553814>.

12. Clive Belfield and Thomas Bailey, “The Labor Market Returns to Sub-Baccalaureate College: A Review,” Center for Analysis of Postsecondary Education and Employment, March 2017, <https://ccrc.tc.columbia.edu/media/k2/attachments/labor-market-returns-sub-baccalaureate-college-review.pdf>.

13. A recent study from the Harvard Business School argues that employers, by undervaluing the associate degree, are creating expensive inefficiencies in the labor market and leading companies to overlook a largely untapped labor pool. See Joseph B. Fuller and

Manjari Raman, *Dismissed by Degrees: How Degree Inflation Is Undermining U.S. Competitiveness and Hurting America's Middle Class*, Harvard Business School, October 2017, www.hbs.edu/managing-the-future-of-work/Documents/dismissed-by-degrees.pdf. Degree inflation also raises the question of broader experience of A.A. graduates in the job market: their employment or underemployment, the kinds of jobs they hold, and longer-term career trends. These questions lie outside the scope of this paper, but they suggest promising avenues for further research.

14. Clive Belfield, John Fink, and Davis Jenkins, "Is It Really Cheaper to Start at a Community College? The Consequences of Inefficient Transfer for Community College Students Seeking Bachelor's Degrees," Community College Research Center, Columbia University, May 2017, <https://ccrc.tc.columbia.edu/media/k2/attachments/really-cheaper-start-at-community-college-consequences-inefficient-transfer.pdf>.

15. Schneider and Columbus, *Degrees of Opportunity*.

16. See Jessie Brown and Martin Kurzweil, *The Complex Universe of Alternative Postsecondary Credentials and Pathways*, American Academy of Arts & Sciences, 2017, www.amacad.org/multimedia/pdfs/publications/researchpapersmonographs/CFUE_Alternative-Pathways/CFUE_Alternative-Pathways.pdf.

17. Michael Prebil, "Better Together: Embedding Certifications to Support Adult Learners," *New America*, October 19, 2017, www.newamerica.org/education-policy/edcentral/better-together-embedding-certifications-support-adult-learners/.

18. Ben Bradley et al., *The Digital Edge: Middle-Skill Workers and Careers*, Burning Glass Technologies, September 2017, <http://burning-glass.com/research/digital-skills-gap/>.

19. Burning Glass Technologies, "Will Your Next Job Require Salesforce Skills?," February 10, 2017, <http://burning-glass.com/will-next-job-require-salesforce-skills/>.

20. There is a large literature including excellent case studies and strategy guides on each of these strategies. Our goal here is simply to highlight some of the actions we think could be the most effective and efficient in increasing the return on the investment students make in pursuing an A.A. degree.

21. Thomas Bailey, Shanna Smith Jaggars, and Davis Jenkins, "What We Know About Guided Pathways," Community College Research Center, Columbia University, 2015, <https://ccrc.tc.columbia.edu/publications/what-we-know-about-guided-pathways-packet.html>. A comparable approach is "structured pathways." See, for example, Mina Dadgar et al., *Providing Structured Pathways to Guide Students Toward Completion*, WestEd, 2013, www.wested.org/online_pubs/resource1280.pdf.

22. Oliver Schak et al., "Development Education Challenges and Strategies for Reform," US Department of Education, January 2017, <https://www2.ed.gov/about/offices/list/opepd/education-strategies.pdf>.

23. Grace Chen, "Why 60% of Community College Students Never Transfer," *Community College Review*, February 17, 2017, www.communitycollegereview.com/blog/why-60-of-community-college-students-never-transfer; and Joshua Wyner et al., *The Transfer Playbook: Essential Practices for Two- and Four-Year Colleges*, Aspen Institute, Community College Research Center, May 2016, https://assets.aspeninstitute.org/content/uploads/2016/05/aspencrc-transferplaybook_05-2016.pdf.

24. Prebil, "Better Together"; and Evelyn Ganzglass et al., "Report on Phase I Study: Embedding Industry and Professional Certifications Within Higher Education," Lumina Foundation, January 2017, <https://www.luminafoundation.org/files/resources/report-on-phase-i-study-embedding-industry-professional-certifications-within-higher-education-january-2017.pdf>.

25. Joshua Alvarez, "The Twelve Most Innovative Colleges for Adult Learners," *Washington Monthly*, September/October 2017, <https://washingtonmonthly.com/magazine/septemberoctober-2017/the-twelve-most-innovative-colleges-for-adult-learners/>.

26. Rachel Baker et al., "The Effect of Labor Market Information on Community College Students' Major Choice" (working paper, National Bureau of Economic Research, April 2017), www.nber.org/papers/w23333.pdf.

27. See Launch My Career Florida, www.launchmycareerfl.org; and Launch My Career Texas, www.launchmycareertx.org.

28. Burning Glass Technologies, *Moving the Goalposts: How Demand for a Bachelor's Degree Is Reshaping the Workforce*, September 2014, <http://burning-glass.com/research/credentials-gap/>.

29. Burning Glass Technologies, *The Narrow Ladder: The Value of Industry Certifications in the Job Market*, November 2017, http://burning-glass.com/wp-content/uploads/BurningGlass_certifications_2017.pdf.

30. Burning Glass, "FAQ on Real-Time Jobs Data," <http://burning-glass.com/faq-on-real-time-jobs-data/>.