



Supporting our Wealth Driving Sectors: The Supply of Technical Talent in
Central Indiana

Executive summary

Upwards of 75 percent of job openings posted in the key industry sectors that drive Central Indiana's economy specify technical skill requirements, with a majority of those technical job postings requiring postsecondary education. The Central Indiana occupational structure in key industries is changing: more people are employed in knowledge-intensive positions. The growth of our region's economy depends on our ability to equip current and future employees with the technical skills and education levels to meet these industry requirements.

Educational attainment, measured by the credentials held by Central Indiana residents, is important to the economic and social well-being of the region. However, we also need people who are educated in fields that align with the regional economy's needs and opportunities. The research commissioned by Hire Up Indy shows that *technical education* related to the region's key wealth-producing sectors and industries is particularly important in Central Indiana because of the increasing numbers of jobs in these areas that require technical skills and technical knowledge.

This report presents data that show the local supply of technical talent is not sufficient to meet Central Indiana employer demand. Our analysis shows Central Indiana has three distinct challenges.

First, Central Indiana has a shortage of people in the adult workforce with the right skills to fill today's technical jobs. The current adult workforce will remain working longer and will make up a larger share of the workforce for the foreseeable future. A large proportion of this group has completed high school and has taken some college courses, but the group's postsecondary educational attainment is very low. Indiana ranks 42nd in the proportion of the workforce holding a bachelor's degree. That is important because today's adults who are now beyond the reach of the K-16 education system will make up to 50 percent of the Central Indiana workforce for the next 25 years. We cannot anticipate a large influx of new, younger workers into the labor force—the share of the labor force between ages 16 to 24 is declining. All of this contributes to the ongoing importance of finding effective ways to increase skills in the current workforce.

*When Central Indiana employers say they cannot find new employees with the right skills they are reporting something very real: Not enough people in the labor force or in the educational pipeline now have or are learning the **technical skills** employers need.*

Regional growth depends on technical skills and knowledge; educational strategies need to focus on increasing the numbers of people skilled in technical fields and the numbers of people holding postsecondary credentials in technical fields.

Second, we need more high school students to pursue technical fields of study and better alignment of those fields with the skills employers need. Our data show that far too few Central Indiana high school students enter technical fields of study that are related to the region's key economic drivers. In career and technical education, for example, more than three times as many students enroll in cosmetology and culinary arts programs than in STEM-focused clusters. That means the \$21 million annual investments to support career and technical education in Central Indiana are not fully leveraging the return needed for our economic future. Simply, we must increase the next generation of technical talent.

Third, we need to increase degree completion among those students and workers who do enroll in postsecondary technical education programs, especially among sub-baccalaureate programs. Sub-baccalaureate degree granting institutions serving Central Indiana – those offering associate degrees – enroll thousands of individuals in technical skill programs, yet an extremely low proportion of those students complete an associate degree or credential. These high-enrollment but low-completion programs represent a significant loss of talent and opportunity while credentials are becoming more important in the technical workforce. Moreover, a very high proportion of all degrees produced in both sub-baccalaureate institutions and baccalaureate institutions are concentrated in a handful of fields, mainly liberal arts, general studies, business administration and health care services. While Indiana produces many more bachelor's degrees than the national average, there is still under-production, relative to demand, in technical fields important to Central Indiana's economy. Finally, many graduates of our leading technical education programs are oriented to finding employment and careers outside the state, further reducing the pool of talent to support Central Indiana industries.

This paper suggests a far sharper focus of the resources provided by our outstanding educational institutions, many of them world-class, to meet the needs of our wealth-producing sectors and industries. The existing misalignment between what we produce through education and what Central Indiana's economic drivers need shows up in distinct ways at each step along our educational spectrum:

- in secondary Career and Technical Education (CTE), students are not entering technical fields that support the region's wealth drivers;
- in sub-baccalaureate postsecondary education, many people are enrolling in technical fields but fail to obtain a credential; and
- in baccalaureate institutions, there are low numbers of enrollments and graduations in technical fields and those who do complete a degree are leaving Central Indiana;
- throughout the pipeline there are opportunities for closer connections between educators and employers to assure students get the right skills for employment in Central Indiana.

Central Indiana has no shortage of talented faculty, education, businesses, elected, and civic leaders genuinely committed to providing the highest quality education. Our next step, and the goal of Hire Up Indy, is to harness this talent and develop solutions that address these challenges.

Supporting our Wealth Driving Sectors: The Supply of Technical Talent in Central Indiana

Supporting our Wealth Driving Sectors: The Supply of Technical Talent in Central Indiana is the second paper commissioned by Hire Up Indy and its Council.¹ The first paper described the key wealth-creating sectors of the region and, within those sectors, described the importance of technical skills and the educational requirements of employers. We used real-time analysis of current job postings to develop those findings.

In this paper, we examine how the supply of talent aligns with the scale of employment demand and the skill needs of Central Indiana's wealth-driving sectors. Specifically, this paper describes the talent available in the current workforce and in the output of our state's secondary and postsecondary institutions.

Our findings are striking. Simply put, data show that the regional educational infrastructure is not producing enough graduates with credentials in needed technical fields. In both

secondary and postsecondary educational institutions, too few students choose to enter technical fields of study. And, too few who do enter these important fields complete a degree or credential. Importantly, the reasons and characteristics for these shortfalls vary by institution, and no single solution will fit each area of the educational pipeline. Yet the cumulative impact on the economy and on employers leads to the same point: Employers report they cannot fill open jobs with people who have the required technical skills.

Indiana is rightfully proud of its world-class educational institutions that excel in many fields of study. While continuing to preserve the wealth of our educational diversity and quality of study opportunities, we also need to increase the production of technically skilled people in fields that are related to the region's growth sectors.

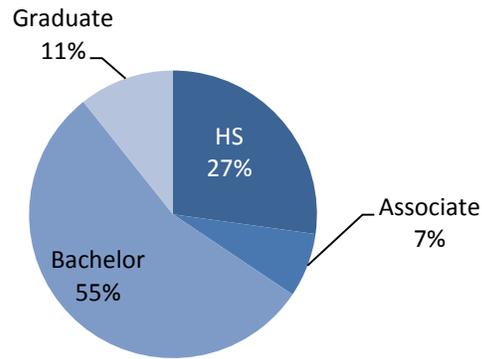
The data presented here confirm that neither the region's nor the state's educational institutions are producing enough graduates with credentials in needed technical fields...the lack of graduates with those skills presents an ever increasing problem and a drag on Indiana's economic growth.

¹ FutureWorks completed the research and data analysis for this paper and the previous paper, *Supporting our Wealth Driving Sectors: Demand for Technical Talent in Central Indiana*.

A quick review: Demand for technical talent in the region’s wealth-driving sectors

Two sectors, manufacturing and health care, have led the Indiana economy for several decades and, in all likelihood, will continue to do so in the future. Together, these two sectors account for 24 percent of all private sector employment and 32 percent of the total wages. In addition, emerging clusters of companies in advanced manufacturing, technology, life sciences, and logistics are growing in scale and importance and account for a significant number of jobs and an even greater amount of income in the Central Indiana economy.

Chart 1: Education Required for Jobs Posted in Central Indiana's Wealth-Producing Industries, 2011-2012



Source: Burning Glass RTLMI, Oct 2011-Sep 2012

All the industries that drive Central Indiana’s economy rely on the ability to attract and retain employees with *technical skills* and postsecondary education. As Chart 1 shows, nearly 75 percent of the nearly 30,000 job postings in Central Indiana’s wealth-producing sectors over the last 12 months require postsecondary education.

The supply of talent in Central Indiana

The supply of talent in Central Indiana is composed of two major elements: the existing talent pool already in the workforce and the pipeline of new talent coming from secondary and postsecondary educational systems. The former can be described in terms of demographics and educational attainment of the labor force. The latter is best described by the outputs (fields of study, graduations, and credentials awarded) of educational institutions.

Existing workforce characteristics

More than 900,000 people are in the adult labor force in Central Indiana. The labor force has seen modest growth over the last 10 years. Over the last five years there has been almost no growth in the total labor force. This is due to slower regional population growth and a significant increase in the number of adults leaving the workforce. The slower growth in the labor force means that there will be fewer people available

to enter open jobs or new jobs in the economy. A large proportion of the Central Indiana workforce over the next 25 years is already beyond the general age range of the K-16 systems. And Indiana shares in the national trend toward an increasing proportion of the workforce between the ages of 25-44. At the same time, the share of new entrants into the labor force between the ages of 16-25 is declining². This makes the skills of the existing workforce, and education for adult workers, important not only for the unemployed but also for the currently employed workforce. In the absence of an influx of new workers, employers will increasingly rely on their current workforce to supply the right skills and talents. Finding effective strategies to increase the skill sets of the currently employed workforce is important.

As other research has shown, a high proportion of the Central Indiana labor force holds high school or less education, but a much lower proportion holds postsecondary credentials. Chart 2 summarizes the educational attainment of the Central Indiana labor force. While Indiana ranks 3rd among states in the proportion of those with a high school degree, the state is just below the midpoint of states in associate degrees and 42nd in terms of the percentage of the workforce with bachelor's degrees.

| | |
|--|------------------|
| Total Population 25 and Older | 1,129,156 |
| Less Than 9th Grade | 3.5% |
| 9th to 12th, No Diploma | 8.4% |
| High School Grad (inc. GED) | 29.8% |
| Some College, No Degree | 20.4% |
| Associate Degree | 7.2% |
| Bachelor's Degree | 20.4% |
| Graduate, Prof. or Doctorate Degree | 10.4% |
| <i>Source: US Bureau Labor Statistics; US Census Bureau, American Community Survey, 5 Year Estimates</i> | |

As we discussed in the previous paper *The Demand for Technical Talent in Central Indiana*, demand is increasing among jobs requiring postsecondary education. This is consistent with recent reports on the growth of 'middle skill jobs' in Indiana. The Center for Education and the Workforce at Georgetown University projects that over the next five years, job growth in Indiana will be concentrated in those jobs requiring at least an associate degree. Moreover, the same center reports that job creation nationally after the recession has been highly concentrated in jobs that require postsecondary credentials³. These trends portend a growing skills and education gap and simply reinforce the need to find effective ways of delivering technical education to the existing workforce.

² Bureau of Labor Statistics, Occupational Outlook Quarterly, 2012.

³ See for example: Anthony Carnevale et al, *Help Wanted: Projections of Jobs and Education Requirements Through 2018* and *Weathering the Economic Storm*, Center for Education and the Workforce.

The pipeline of technical talent

In addition to the talent available in the Central Indiana current workforce, the systems of secondary and postsecondary education comprise a pipeline for producing the new talent we need. While some of the regional talent comes from outside Indiana, our focus here is on the supply of technical talent from *regional education sources and statewide educational institutions*. Moreover, the local and regional pipeline for talent production is not only important for existing employers but especially so for new employers locating in the area who need access to new employees and their skills. The availability and quality of educational resources are now among the most important considerations in new business location decisions. While there are numerous important characteristics of the pipeline, it basically is composed of a few large elements as pictured below. We will examine the production of talent in each segment of the pipeline.



Secondary education and Career and Technical Education in Central Indiana

Secondary high schools prepare young Hoosiers to enter postsecondary institutions or to enter employment. Indiana has one of the highest graduation rates for secondary schools in the nation.⁴ Central Indiana, however, contains extremes. Indianapolis has the lowest graduation rate in Indiana (65 percent) while Carmel (though with far fewer graduates than Indianapolis) shows a 94 percent graduation rate.⁵

At the same time, these secondary graduation data include students who graduated and received a diploma, by virtue of an exemption known as a waiver, from passing the Indiana End of Course Assessment. In Indianapolis Public Schools, high schools reported that between 10 and 45 percent, with a city-wide average of 25 percent, of their graduates received a waiver from the Assessment in order to receive a

⁴ US Department of Education, 2012.

⁵ Indiana Department of Education, 2012. Some of these rates bear closer scrutiny and consideration on the impact on the characteristics of high school graduates entering the workforce. Across Indiana, school districts may grant waivers from the End of Course Assessments in math, English and other subjects that all graduates receiving a diploma must pass. In Indianapolis, a substantial proportion of graduates who did not pass the ECA are granted waivers from that requirement. If graduates with waivers are excluded from the graduation rate calculation, the 65% rate drops to 47%.

diploma in 2011⁶. While suburban schools awarded fewer waivers, the region as a whole graduated significant numbers of students with waivers.

Waivers serve to help students gain a diploma and leave high school, but are not without controversy. The impact of waivers in the labor market means that students may seek employment armed with a high school diploma but performing at a math and reading level less than that required by the End of Course Assessment. Employers who report with dismay that they receive applications from high school graduates without the skills appropriate for basic entry-level jobs may be receiving applications from graduates who received waivers.

While high school graduations are important, much of the demand for talent in Central Indiana's wealth-driving sectors requires technical skills beyond a general high school diploma. For the purposes of Hire Up Indy, our analysis of secondary education focuses on technical education or Career and Technical Education (CTE) offered at either a comprehensive high school or career centers and the alignment between secondary CTE and the talent needs of Indiana's key sectors and clusters.

The organization, administration, and delivery of Career and Technical Education in Indiana are complicated. Indiana's Department of Education (DOE) guides and regulates the programs offered through CTE. Individual school districts deliver CTE in high schools or in stand-alone career centers. Of the 26 career centers in the state, eight are in Central Indiana. These draw students from single or multiple school districts and provide programs of study in technical fields. Indiana supplied slightly more than \$100 million for CTE programs and facilities during the 2011-12 school year, and Central Indiana received about \$21 million. Federal Perkins Act funding supplies another \$24 million to Indiana for both secondary and postsecondary CTE programs; about two-thirds of which is distributed to secondary schools. About 1/3rd of all Central Indiana high school students will enroll in at least one CTE-funded class.⁷

In what fields of study do students who enroll in secondary CTE programs choose to focus and then prepare for employment or further education? Chart 3 (next page) shows the numbers and proportions of Central Indiana high school graduates who also graduated with a CTE concentration at a high school or career center in 2010-2011.⁸ The figures in this chart show the total number of secondary students graduating with a diploma and a concentration in a specific career cluster.

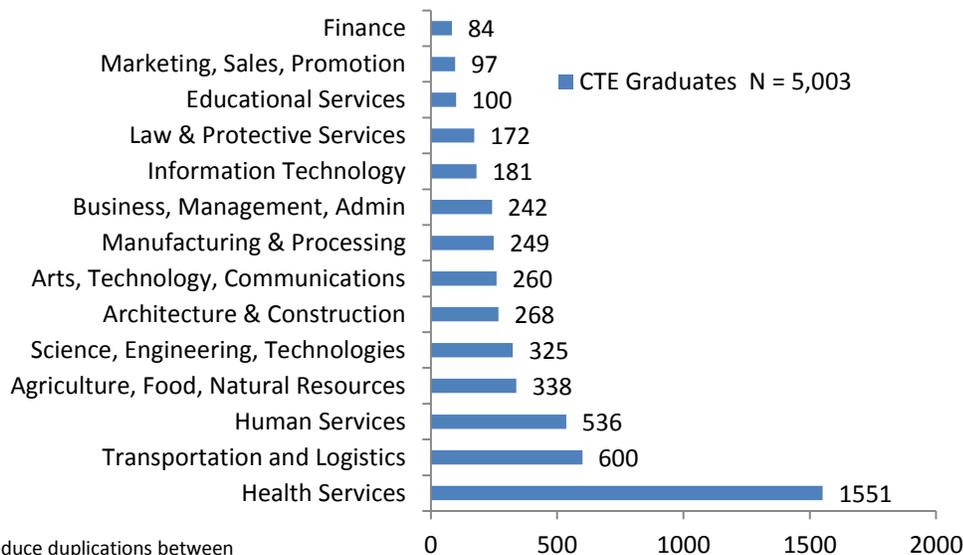
⁶ Indiana DOE, 2013.

⁷ We provide a more detailed description of CTE in Appendix C that is included in the version posted on the EmployIndy website. It is omitted here for brevity.

⁸ A concentration is at least six credits or about three courses related to a cluster or field of study. Another level of concentration in CTE is termed 'completers' who are students accumulating enough credits to concentrate in a field *and* taking an approved end of course or pathway assessment.

About 65 percent of the concentrations are in the four clusters of health, transportation, human services and agriculture. Health care is clearly the largest source of concentrations with nearly a third of all concentrations. Other fields, such as manufacturing, information technology, and sciences related to the region’s key economic drivers, show far fewer concentrations. The array of figures illustrates the choices

Chart 3: Central Indiana Secondary Graduates with Concentration in a CTE Career Cluster, by Cluster, 2011*



that students are making as they select CTE classes, eventual concentrations, and career directions. Three times as many students choose to enter human services (composed of cosmetology or culinary arts programs) than information technology; almost twice as many choose transportation and logistics (mainly automotive technologies) over manufacturing or science and engineering technologies (STEM related). In the end, regardless of how much or how effective advice and information about careers may be, students are choosing to enter the clusters and fields shown in this chart.

These data suggest that CTE outputs, the graduates who concentrate in a particular field, are simply not well aligned with the Central Indiana talent demands. With the exception of health care, relatively few students graduate with concentrations in high-demand technical fields. However, lack of concentrations in key technical clusters is only one dimension of the misalignment.

A second dimension of the misalignment

CTE clusters include different specific programs of study related to occupations or specific technical areas; in some ways these fields of study reflect the content of technical education within these larger clusters. The distribution of students in programs of study inside these clusters is a second dimension of potential misalignment. And, in fact, in some clusters like manufacturing students tend to concentrate in fields of study with limited relevance for some highly in-demand jobs. Using information on the enrollments of

students within programs, we show that approximately 190 of the 249 manufacturing cluster concentrators are trained in welding or machining, and just over 50 would graduate with concentrations in manufacturing engineering or advanced manufacturing. And only about 7 would graduate with a concentration in industrial maintenance, which is one of the most consistently in-demand occupations across all of manufacturing. In the transportation and logistics cluster, 84 percent of those concentrating graduates were in auto service technician fields of study. Only very small numbers of students enter other transportation technology related fields of study.

So the second characteristic of this misalignment is that the contents of these clusters of programs are often not aligned with what employers, in the region's leading sectors, are asking for.

Traditionally, career and technical education offered the skill and vocational programs students needed to go to work. In the last decade, CTE has shifted its focus to prepare students for postsecondary education and careers. However, many students continue to select fields of study based on more immediate job prospects. For CTE educators, it is a difficult educational balance to offer both programs that serve more immediate job needs versus areas that lead to careers in key industries. Indiana has begun to implement a career pathway system that articulates secondary curriculum to postsecondary courses and has increased the use of dual enrollment to give students college credit for courses taken while still in high school. Yet the proportions of students entering fields that are related to the talent demands of the regional economy remain low.

Postsecondary technical education in Central Indiana

Indiana and Central Indiana are home to outstanding postsecondary institutions granting certificates, associate degrees and bachelor's degrees. In all, about 16,000 associate degrees and 42,000 bachelor's degrees are awarded in the state annually; among four-year schools approximately 60 percent of these are awarded to graduates who resided in Indiana at the time of enrollment⁹. It is not possible to precisely quantify how many of these graduates will fill in-demand jobs in Central Indiana.

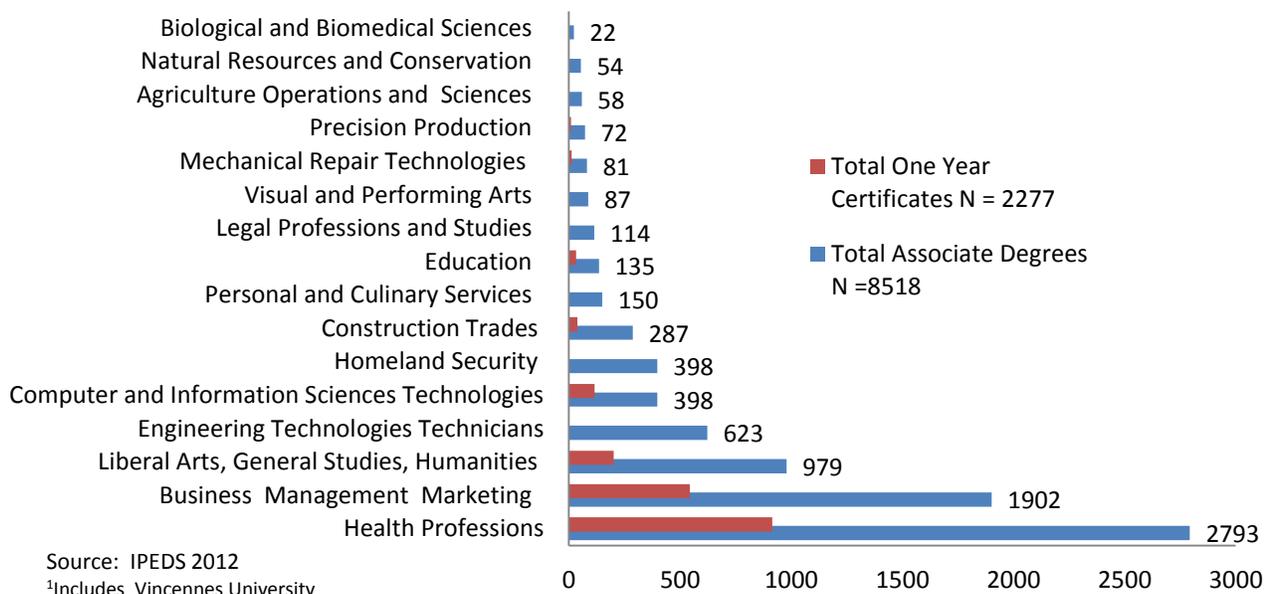
Though, it is clear that Indiana colleges supply a significant proportion of the Central Indiana workforce and are thus the most critical sources of the talent supply to the regional economy. How well the output of two- and four-year Indiana colleges (output in terms of degrees and certificates awarded) is aligned with the talent demands of employers in the regional economy is, therefore, important because many graduates will stay in the area and build their working careers. For example, a recent report from the Indiana Business Research Center (IBRC) observed among a cohort of those receiving an associate degree from an Indiana college, 71 percent were still employed within Indiana five years after graduation. Comparable

⁹ National Center for Educational Statistics, State Profiles-Indiana, 2012. Indiana awards almost 10,000 more bachelor's degrees each year than the average for the US (32,000); CHE 2011 data, author's analysis of enrollment by county of residence.

figures for those receiving bachelor’s degrees were 47 percent (see Chart 7 on page 11). A more recent study for the Central Indiana Corporate Partnership (CICP) by the Battelle Institute, supported by the Lilly Endowment, raised concerns about the substantial numbers of graduates of Indiana’s four-year colleges and universities leaving the state for employment in knowledge-intensive occupations elsewhere¹⁰. However, the IBRC and CICP reports both identify the importance of Indiana graduates to the Indiana economy.

Associate degrees and certificates: Chart 4 shows about 11,000 associate degrees and certificates (of more than one year of study but less than two) were awarded in 2011 by Indiana public and private colleges serving the Central Indiana labor market (see appendices for colleges included). The fields shown here represent the top fields among the colleges in which associate degrees were awarded. This chart shows an extreme variation in both the absolute numbers of awards and the proportions of degrees awarded in different fields. Compared to the demand for technical skills and talent pictured in our previous paper, the misalignment suggested by this chart with demand is striking. For example, the absolute numbers of awards within a field, such as precision production or repair, are far below the level of job demand in the Central Indiana region alone. Or, in the life sciences cluster, demand for lab technicians and information technology technicians far exceeds the related degrees or certificates awarded by this group of colleges.

Chart 4: Associate Degrees and Certificates, Top 16 Fields, Selected Public and Private Postsecondary Institutions within 50 Miles of Indianapolis, 2011¹



¹⁰ See: Indiana Business Research Center, “How Education Pays...” 2011; and, CICP, “Indiana’s Competitive Economic Advantage: The Opportunity To Win The Global Competition For College Educated Talent,” 2012.

A second important characteristic of this distribution of credentials is the high concentration of credential awards in just a few fields. Taken together, three fields—health professions, business occupations and liberal arts – account for just over 70 percent of all associate degrees and certificates awarded by these schools in 2011. While degrees in health professions serve the talent demands of one of Central Indiana’s key economic sectors, there were 50 times as many health-related credentials awarded in 2011 than credentials in precision production. Yet during 2011 and 2012, there were 14,000 and 12,000 job postings in Central Indiana in the health care and manufacturing sectors, respectively.

Simply based on the numbers of credentials awarded, it would be easy to assume that too few people are enrolling in technical education leading to associate degrees or certificates.

However, that is not the case. Enrollment data suggest *many* individuals are enrolling in technical programs related to talent demand in Central Indiana, but remarkably low numbers of those are completing a degree.

Chart 5 shows enrollments and completions (associate degrees) in selected fields at Ivy Tech Community College during the 2009-2010 and 2010-2011 academic years. These are ranked by enrollment.¹¹ For simplicity’s sake, we look at Ivy Tech Community College because of the relatively large number of overall enrollments across the Central Indiana region.

Numerous Indiana and national reports have noted the low rates of completion for credentials in sub-baccalaureate granting colleges.¹²

Chart 5: Enrollments and Associate Degrees Awarded, Selected Regions and Fields, Ivy Tech Community College, Central Indiana, Totals 2009-2011

| Fields of Study | Headcount Enrollment | Associate Degrees Conferred | Percent Degrees / Enrollment |
|---|----------------------|-----------------------------|------------------------------|
| Liberal Arts , General Studies, Humanities | 24780 | 446 | 2% |
| Business, Marketing, Related Support Services | 16399 | 1145 | 7% |
| Health Professions And Related Programs | 12597 | 2101 | 17% |
| Education | 5952 | 224 | 4% |
| Computer And Information Sciences | 5334 | 324 | 6% |
| Engineering Technologies | 5205 | 415 | 8% |
| Homeland Security, Protective Services | 4487 | 179 | 4% |
| Construction Trades | 2504 | 401 | 16% |
| Visual And Performing Arts | 2092 | 90 | 4% |
| Legal Professions And Studies | 1540 | 138 | 9% |
| Mechanic And Repair Technologies/technicians | 1215 | 71 | 6% |
| Precision Production | 863 | 97 | 11% |
| Biological And Biomedical Sciences | 652 | 32 | 5% |
| Agriculture, Agriculture Operation | 214 | 12 | 6% |
| Personal And Culinary Services | 86 | 24 | 28% |
| Communication, Journalism | 58 | 14 | 24% |

Source: CHE 2012; includes: Indianapolis, Columbus, Bloomington, Muncie and Kokomo Ivy Tech regions.

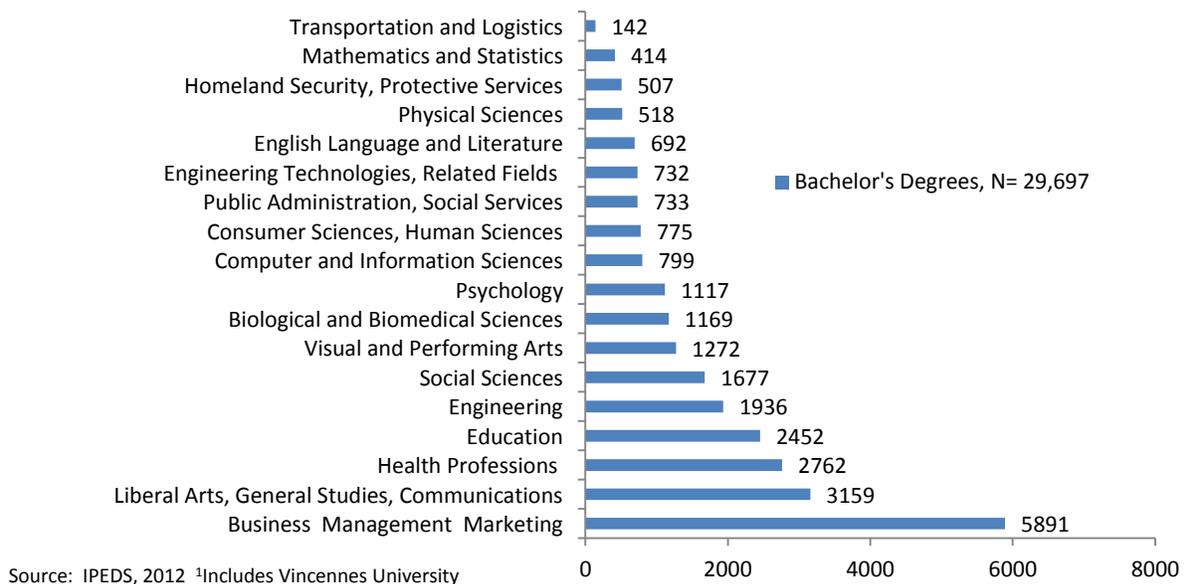
¹¹ See appendix for a description of the data in this chart

¹² For example, see data and reports from Complete College America, www.completecollege.org and the Lumina Foundation for Education www.luminafoundation.org

Over the last several years, higher education in Indiana, including Ivy Tech Community College, has launched a number of initiatives to increase degree completion. However, the data in Chart 5 show two important emendations to the general observation about low completions. First, the ratios of enrollment to completions in *technical* fields are exceptionally low. Only five of the 16 fields in Chart 5 show completion percentages above 10 percent. Second, while large numbers of people are enrolling in technical programs very few receive a credential, in this case a degree. In engineering technology, for example, of the 5,200 students enrolling in this field between 2009 and 2011, fewer than 1 in 12 received an associate degree.

It is also clear that enrollments in technical programs are not the issue. Despite the very large numbers of enrollment in technical programs at Ivy Tech over these two years, few obtained a credential. Reasons for this lack of completion are numerous and range from individual decisions to the structure of educational institutions; however, the numbers suggest a huge loss of potential graduates with credentials that employers seek. Capturing this potential talent by increasing focus on completion and strategies for degree completion is one of the single most important educational strategies for increasing educational attainment in Central Indiana.

Chart 6: Bachelor's Degrees, Top Fields, Selected Public and Private Postsecondary Institutions within 100 Miles of Indianapolis, 2011



Bachelor's degrees: Though not quite as pronounced as the distribution of associate degrees and certificates shown previously, baccalaureate degrees awarded in 2011 by Indiana postsecondary public and private institutions reflect similar characteristics. First, the same three fields of business, liberal arts (including communications here) and health account for 40 percent of the bachelor's degrees. If the field of education is included, then it increases to nearly half of all degrees awarded in 2011.

Chart 6 shows major fields of study and bachelor's degrees awarded at Indiana baccalaureate-granting colleges and universities that are within a 100-mile radius of Indianapolis. This includes both smaller

colleges with enrollments of around 1,000 and Indiana’s flagship research universities—Purdue and Indiana universities with enrollments exceeding 40,000 total students each. Together, enrollment represented in this chart is just under 220,000 students.

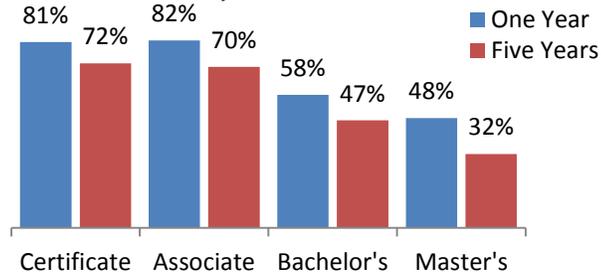
And, as seen with associate degrees, the technical fields shown here that are important to the Central Indiana economy are at the lower end of the distribution of bachelor’s degrees. Excluding the substantial number of health care degrees awarded by these institutions, all the other technical fields combined are less than the number of degrees awarded in the business, management and marketing field alone.

Engineering, and biomedical sciences, both important technical fields for Central Indiana, show a substantial total of 3,200 degrees awarded. However, unlike the description of associate degrees (where the students are largely drawn from local and regional geographies), the colleges in this sample include students from larger Indiana markets, the nation, and internationally.

Purdue University, for example, has the second largest international student population among public, four-year universities in the nation.¹³ For both the engineering and the biomedical sciences fields, Purdue University and Indiana University at Bloomington are the major sources of those degrees. Purdue University (including IUPUI) accounts for 1,500 of the 1,900 total engineering degrees.¹⁴ Purdue and Indiana University together

(including IUPUI) account for 760 of the 1,160 biomedical science degrees shown in the chart. Because of these schools’ national standings, a high proportion of their students will leave the state upon graduation.

Chart 7: Indiana Postsecondary Graduates, Remain Rates, 2000-2005 Cohort



Source: IBRC, IWIS

A major question facing Central Indiana employers is how many graduates from these leading colleges will stay in Central Indiana. As the CICIP/Battelle report notes, approximately 80 percent of the out-of-state students attending an Indiana college will depart after earning a diploma; one-third of the Hoosier graduates will leave the state. Chart 7 shows percentages of Indiana graduates who are employed in Indiana after graduation. Five years after graduation, over half of those with bachelor’s degrees have left the state, or at least employment in the state. These characteristics suggest, that many—though an unknown number— of the graduates of these programs will not only be candidates for employment in Central Indiana, but will surely look for opportunities globally.

¹³ “Purdue’s international student population ranks among highest in United States”. News Release, Purdue University, November 14, 2011

¹⁴ Rose-Hulman Institute of Technology accounts for almost all (378) of the rest of the engineering degrees awarded in this group of colleges.

Conclusions

The supply of talent to Central Indiana’s key wealth-driving sectors and growth clusters is determined in large part by the output—or graduates—of its educational systems. Those systems—secondary and postsecondary educational institutions—comprise the talent pipeline for young people and adults seeking opportunities for employment and careers, and for employers who seek people with those talents. Most of the Central Indiana labor force—and those who will be in the labor force for the next 25 years— is already beyond the formal K-16 pipeline; yet those same institutions, especially the postsecondary institutions, are still critical to the education and training needs of adult workers. The largest impact will come from aligning the educational output with the needs of the regional economy.

The existing misalignment between what we produce and what Central Indiana’s economic drivers need shows up in distinct ways within our current workforce and along our educational pipeline. Each has a central challenge to be addressed and a bright spot to leverage to boost our supply of talent:

- Low postsecondary educational attainment in the current labor force and impending demographic shifts portend a growing skills gap among experienced employees. *A bright spot is the occupational shift toward a knowledge economy is creating more opportunities for a highly educated workforce.*
- In secondary CTE programs, too few students are choosing to enter technical fields related to Central Indiana’s key sectors and clusters. *A bright spot is the increasing enrollments in science and engineering curricula/courses and focus on STEM-related fields.*
- In sub-baccalaureate programs, far too few credentials in technical fields are awarded and the chances of completing a credential in any field are low. *A bright spot is that many people enroll in the technical programs that are important in Central Indiana.*
- In baccalaureate institutions, relatively few degrees from technical programs are awarded compared to larger fields, and a relatively high proportion of those graduates are likely to leave the state sometime after graduation. *A bright spot, compared to sub-baccalaureate institutions, is that the production of technical degrees is more robust and balanced.*

The data demonstrate the need for a broad strategy that addresses the entire spectrum of educational output. Without attention to each of these areas in postsecondary, sub-baccalaureate, and baccalaureate programs we will not create a truly effective way for Hoosiers to gain the technical skills they need. For example, a strategy to increase the number of secondary CTE students choosing to enter a technical field and then enrolling in a technical program at a community college will only direct them into programs where very few are likely to complete a degree.

We must develop comprehensive strategies that will encourage secondary students to choose a technical field of study **and** will make sure that more students can enter, complete and obtain a postsecondary credential. And, an important component of this strategy is the role of employers in engaging with education to make sure that graduates have the right skills for Central Indiana employers.

Finally, this pipeline represents a significant resource for the region. The state invests more than \$20 million in Central Indiana CTE alone, and invests much more than that in postsecondary education. And it is important to note that the resources include more than just the dollars. They include facilities that support state-of-the-art education, and the talents of educational leaders and faculty who want to offer students the best and most relevant technical education possible. With a strategy to shore up the pipeline to produce the talent that Central Indiana employers need, these resources will prove invaluable.

Fortunately, Central Indiana has no shortage of talented faculty, education, business, elected, and civic leaders committed to providing the highest quality education. The next step is to build collaborative leadership to identify a comprehensive approach to the challenge of technical talent in Central Indiana.

Appendix A:

Notes about the data used in this paper

As with our previous paper, *The Demand for Talent in Central Indiana*, this paper employs some innovative data sources and looks in detail at the supply of talent from secondary career and technical education and postsecondary technical programs.

Secondary Education CTE data: Most of the data presented here on secondary career and technical education has not, to the best of our knowledge, been reported by the Indiana Department of Education or previously published in the ways used in this paper. Specifically, the Department does not publish statistics on absolute numbers of enrollments in technical fields or the fields in which graduating students receive technical education. While individual school districts and career centers report these data to the department there are no procedures for reporting the information to the public or to Indiana state government. Other characteristics of CTE are reported annually (see for example: <http://www.in.gov/dwd/files/DataProfile2011.pdf>) but these reports focus on overall enrollments (classes taken, not students) and the percentages of students who meet performance requirements or student population characteristics. Mostly, the reporting follows what is required by state or federal oversight regulations and funding formulas.

Data shown here were obtained with the generous cooperation of the Department of Workforce Development that manages data collection and reporting for CTE and for the Department of Education. Because the data are not generally organized by field of study or by student, despite the best efforts of DWD to respond to our data requests for the numbers of students who were involved in CTE, there are some unavoidable caveats that need to accompany our interpretations. We have tried to note these and in some cases have made adjustments in the numbers we reported in charts and tables.

For example, funding for CTE in school districts is determined by course enrollments at the high schools offering CTE courses. Funding does not follow individual students. So, the information collected is based on enrollments and not individual students; consequently the numbers of enrollments (classes taken) can and does far exceed the actual number of students in a field of study. Moreover, the enrollment (and by implication student) counts in fields can be duplicated between career centers (where enrollments took place) and home schools (where the student came from and was also counted as an enrollment). We have tried to account for this by looking separately at the relative volumes of enrollments in a field (as an indicator of what students are choosing) and at the CTE concentrations of the graduates (as a relative indicator of outcomes).

Postsecondary data: This paper made use of data on enrollments and awards from IPEDS, the federal educational data source for schools approved to distribute financial aid. In addition, we drew on postsecondary data supplied by the Commission on Higher Education. Moreover, we stay at a fairly high level of analysis in our assessment of alignment by focusing on broad fields of study like ‘engineering’ instead of ‘electrical engineering’ or ‘mechanical engineering’. However, it is important to note that employers themselves are very concerned with the specific kinds of skills held by college graduates either

at the baccalaureate level or sub-baccalaureate levels. Our purpose here is to provide an overall perspective on the alignment that shapes the supply of talent to the Central Indiana regional economy.

Our reporting of 'completion ratios' to describe the numbers of students receiving a degree compared to the number of enrollments in a program field in the same year is different than a completion rate that is generally reported for postsecondary institutions. Currently, 'graduation rate' is a federally defined metric that counts the number of awards granted to a cohort of students who are also 'first time, full time' students; that is it identifies a cohort of students who are enrolling full time in an institution and have not been enrolled in another institution (accumulated credits) previously. This restrictive definition allows the US Department of Education to develop a comparable descriptive statistic. However, it is widely recognized that few students who attend sub-baccalaureate programs meet the restrictive IPEDS definition of first time/full time. And many students now attending four-year programs don't meet that definition.

Our measure of output for the colleges granting associate degrees is a completion ratio, which is simply the headcount enrollment in a program in a given term/year compared to the number of students receiving a credential in that same time period. This captures all the students who were enrolled in a program and all the students who were able to complete a degree. We took two years of these data in order to account for any unusual variation in enrollments or completions.

Appendix B:

Our research adopts appropriate, though somewhat arbitrary, parameters for the sources of talent for the Central Indiana regional economy. We include those receiving educational credentials from secondary and postsecondary institutions, public and private, that are within the Central Indiana region and within a 50 or 100 mile radius of Indianapolis (for two-year and four-year colleges, respectively). We include some postsecondary schools outside that boundary that serve a statewide, national and international student market such as Purdue University, Vincennes University, Rose-Hulman Institute of Technology, and IU-Bloomington.

Associate and Certificate Granting Schools included: Accredited, associate-only granting postsecondary schools were selected using a 50 mile radius of downtown Indianapolis and those having a 2011 enrollment of over 500 students. Four-year schools that also offer associate and one-year certificates within a 100 mile radius of Indianapolis were also included. Vincennes University was included. These schools are, in order of the total number of associate degrees awarded:

| | |
|---|--|
| Vincennes University | Brown Mackie College-Indianapolis |
| Ivy Tech Community College-Central Indiana | Harrison College-Indianapolis East |
| Indiana Wesleyan University | Harrison College-Columbus |
| Ivy Tech Community College-Kokomo | Harrison College-Anderson |
| Ivy Tech Community College-East Central | University of Indianapolis |
| MedTech College-Indianapolis | Indiana University-Bloomington |
| ITT Technical Institute-Indianapolis | Indiana University-East |
| Ivy Tech Community College-Bloomington | Huntington University |
| Ball State University | Taylor University |
| Indiana University-Purdue University-Indianapolis | Anderson University |
| Ivy Tech Community College-Columbus | Butler University |
| Purdue University-Main Campus | Rose-Hulman Institute of Technology (0 Associates) |
| Harrison College-Indianapolis | Saint Joseph's College (0 Associates) |
| MedTech College-Greenwood Campus | |

Baccalaureate Degree Granting Schools included: Accredited baccalaureate degree granting postsecondary schools were selected using a 100 mile radius of downtown Indianapolis and those having a 2011 enrollment of over 1,000 students. Vincennes University was included. These are, in order of the total number of bachelor's degrees awarded:

| | |
|---|-------------------------------|
| Indiana University-Bloomington | DePauw University |
| Purdue University-Main Campus | Earlham College |
| Indiana University-Purdue University-Indianapolis | Saint Joseph's College |
| Ball State University | Manchester College |
| Indiana Wesleyan University | Hanover College |
| Butler University | Wabash College |
| University of Indianapolis | Vincennes University |
| | Harrison College-Indianapolis |

Martin University
Rose-Hulman Institute of Technology
Taylor University
Indiana University-Kokomo
Anderson University
ITT Technical Institute-Indianapolis
Indiana University-East
Marian University

Franklin College
Huntington University
Harrison College-Fort Wayne
Brown Mackie College-Indianapolis
Harrison College-Grove City
Harrison College-Indianapolis East
Harrison College-Northwest