Employer Perception of Industry Recognized Credential Attainment in the Secondary System

by

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Wagner, Jennifer M. ***Employer Perception of Industry Recognized Credential Attainment in the Secondary Education System***

Abstract

This study sought to determine the most in-demand and valued industry recognized credentials from the lens of Wisconsin employers. Employers identified credentials that can be earned in high school that are regarded as required or preferred for employment. Specially, this study aimed to collect employer perceptions of industry recognized credentials being earned in the secondary system. Both quantitative and qualitative data were collected utilizing descriptive statistics and thematic analysis. The study revealed that while employers find industry recognized credentials valuable, only a small percentage are required for employment. The study also revealed that many employers are unfamiliar with the vast amount of credentials currently offered in high schools.

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Table of Contents

List of Tables

Chapter I: Introduction

College and career readiness initiatives are front and center in discussions taking place in school districts nationwide. Added emphasis on credential attainment, specifically at the secondary education level, is growing in popularity. Education Strategy Group is a mission-driven consulting firm that works with K-12, higher education, and workforce leaders to achieve impact and move the needle on issues that are critical to improving student success and advancing equity, indicates that credentials provide currency, or value in the labor market and serve as key momentum points on a path to economic opportunity (Education Strategy Group, 2018). From industry-recognized credentials IRCs to postsecondary certificates, licenses, associate and bachelor's degrees, "post-high school credentials" have become a necessary commodity for career success (Education Strategy Group, 2018). The number of students who earn an IRC is being considered as a measure of student success and program quality (Castellano et al, 2005). As greater weight is placed on these credentials, a fundamental challenge has emerged. With over 4,000 credentialing bodies nationwide offering thousands of different industry-recognized credentials across sectors, very little information is available about their value as legitimate pathways to high-skill, high-demand employment (Education Strategy Group, 2018).

Parents, policymakers, and much of the public worry that today's U.S. education system is not adequately preparing youth for life after high school (Giani, 2022). For decades, one of the most prominent approaches for ensuring that students were ready for the labor market has been providing them with career and technical education (CTE), once known as vocational education (Education Strategy Group, 2018). Education Strategy Group recently shared that states are struggling with identifying IRC's that are valued by employers in hiring, compensating, and

promoting workers, which incentives for students, schools, and districts will lead to growing attainment rates, and a lack of access to data which limits their ability to understand which credentials are being earned and by whom (Education Strategy Group, 2018).

The Wisconsin Career and Technical Education (CTE) Incentive Grant program was established on December 11, 2013, by Wisconsin Act 59 Wisconsin State Statute 106.273. Grants from this program incentivize school districts to offer high-quality CTE programs that mitigate workforce shortages in key industries and occupations (Wisconsin Department of Public Instruction, 2020). The grants reimburse up to $1,000 for each pupil in a school district earning a certification that falls into five categories including the Wisconsin Department of Public Instruction Cooperative Education Skill Standards (Skills Co-Op), Wisconsin Department of Workforce Development Youth Apprenticeship program, Business & Industry Recognized Certifications, Wisconsin Technical College Certifications, and Wisconsin Certified Pre-Apprenticeship Programs. This research will include only business and industry recognized certifications.

While the CTE Incentive Grant dollars go directly to the school district, an additional IRC program was added in 2017 where students who complete an Emergency Medical Technician (EMT), Emergency Medical Responder, Firefighter 1, Firefighter 2, or Firefighter Inspector certificate receive $500 for each credential earned. The CTE Incentive Grant program originally had $3.5 million set aside for school districts. In 2019, $6.5 million was awarded to school districts in Wisconsin. According to legislation and accompanying administrative rules, the intended use of the grant money reimbursed to school districts is not defined. The legislation does not state the intent of the dollars should be used to fund expenses related to offering IRC's. Administering this program requires the collaboration of several state departments. The

Department of Workforce Development (DWD), with the consultation of the Department of Public Instruction (DPI) and the Wisconsin Technical College System Office, create an approved list of industries and occupations with workforce shortages and an accompanying list of IRCs (DPI, 2020). School districts are eligible for reimbursement for graduating students who have earned certifications on the approved list. For 2022 high school graduates, DWD/DPI processed 5,100 eligible claims for industry credentials.

A 2017 report by Georgetown's Center on Education and the Workforce found that 30 million "good jobs" nationwide were held by the "middle" workers who have less than a bachelor's degree but more than a high school diploma (Sussman, 2019). To combat this issue, more than half of states, including Wisconsin, have responded to the demand for this emerging workforce by including IRCs as a new accountability measure in their Every Student Succeeds Act (ESSA) plans (Sussman, 2019). However, many of them are lenient in terms of which credentials count as part of college and career readiness.

Every potential incentive to prioritize IRCs is contingent upon having accurate and reliable data on credential completion (Education Strategy Group, 2018). The research found that half of all states are not collecting the necessary data to know how aligned their credential programs are with employer demand, and not a single state's secondary credential program measures as "highly aligned" with the job market (Credentials Matter, 2019). Many states rely upon self-reported credentialing exam data from students to determine which credentials have been earned (Education Strategy Group, 2018).

As America’s key industries offer high salaries in return for candidates with the necessary abilities and credentials to fill their vacancies, the knowledge, skills, and third-party industry credentials earned in secondary career and technical education programs, seem a close

match (Hendricks et al., 2021). It can be argued that CTE programs are most effective when schools partner with relevant industries (Hendricks et al., 2021).

Employers are vital in recognition and value of IRC's. Education Strategy Group recommends that employers clearly state in their job postings and advertisements which IRCs are required or recommended for positions and offer higher pay for those who have earned an IRC (Education Strategy Group, 2018). With so many IRCs to choose from, school districts need to prioritize what should be offered, and employer guidance is essential in this process. While some industries have set standards for credentials that are agreed to and recognized by all employers in that field, other sectors have not, leaving states in a quandary when determining which industry credentials have value (Education Strategy Group, 2018).

Statement of the Problem

At first glance, standards and assessments developed by industry seem a perfect match for a related career and technical education program in high school. CTE instructors and administrators can be sure that all the skills required by industry are part of a program, and students who earn certifications are theoretically a step ahead of other applicants for employment in that industry (Castellano et al., 2005). While IRCs, on the surface, appear to be an indicator of early entry to employment, there are issues to consider. Maintaining facilities at a high school, covering the cost of the exam, employer recognition of an IRC, and a lack of data specific to IRC attainment are at the forefront. Some of these barriers can be addressed, while others may be insurmountable in the quest for secondary CTE accountability systems (Castellano et al, 2005). Credential Currency, authored by Education Strategy Group, stressed that identifying IRC's that are high value and differentiating them from those that do not provide a return on investment for credential earners is of paramount importance (Education Strategy Group, 2018). A lack of

overall clarity exists for employers and those seeking employment when determining what credentials are of value. The lack of transparency about the meaning of credentials is an even more serious problem for individuals seeking education that will help them reach their goals, particularly for employment and careers (The Lumina Foundation, 2015). Student access to IRC's varies depending on the school that students attend. One research study found that even high schools that have historically been strongly vocational are having trouble maintaining the instructional time necessary for students to qualify to take the exams for industry certification (Castellano et al., 2005). Another concern is that school districts have added emphasis on an increase of standardized test scores, leaving less time for school districts to offer IRC's.

Addressing impacts of the COVID-19 pandemic, the slowdown in IRC attainment will have a twofold impact on our current crisis (Estes, 2020). Many education and assessment opportunities were not available. Advance CTE warned that it is unlikely to measure the pandemic's full effect on credential attainment (Advance CTE, 2023).

Purpose of the Study

The purpose of this study is to determine the most in demand and valued IRCs by employers. The study will aim to address the value of IRC attainment in high school. The goal is to give insight on better funding alignment to the most in demand IRCs and provide guidance to school districts on credential offerings.

Research Questions

1. What are the most in-demand Industry Recognized Credentials sought by employers?
2. To what degree do employers value credential attainment in the secondary system as a means of preparing students for the workplace?

3. Which credentials are currently being earned by students, and how do those credentials align with employer demand?

Significance of the Study

As leaders from K-12 and postsecondary education, economic development, and business and industry work together to identify the credentials that are of high value, they should consider the extent to which each credential shapes employer decisions and provides currency to learners (Education Strategy Group, 2018). Identifying IRC's as high value is not enough to ensure student participation. States must eliminate barriers to attainment and establish pathways rewarding students for participation (Sussman, 2019). Navigating to a coherent list of IRCs with labor market value will certainly be challenging for states, but it is even more challenging for students, parents, schools, and districts to wade through the thousands of IRCs on their own and draw conclusions about which offer value (Education Strategy Group, 2018).

Earning credentials with verifiable labor market value benefits both students and state economies. To meet the goal of preparing individuals for success in the workforce, education systems must simultaneously support students' academic and technical success and ensure that the acquired knowledge and skills are aligned to workforce needs (Education Strategy Group, 2018). A better understanding of the state's labor market "through a process to identify credentials of value" is a meaningful step toward ensuring this alignment exists between education and workforce systems (Education Strategy Group, 2018). IRC's bring "real-world" standards and expectations into high school, presumably increasing student engagement in and completion of CTE programs and course sequences that culminate in such credentials (Castellano et.al, 2005).

If states cannot identify credentials of the highest value to employers, attainment goals and accountability metrics could drive students and returning adult learners to unwittingly pursue lower-value credentials that do not lead to good jobs (Education Strategy Group, 2018). What is needed, however, is to be able to account for the efforts and successes that are occurring in high schools that provide these opportunities to earn IRC's (Castellano et.al, 2005). Ultimately, a credential is currency for students, and is up to K-12, postsecondary, and workforce leaders to ensure that students can cash in that currency to realize economic prosperity (Education Strategy Group, 2018).

Assumptions of the Study

Regarding this study, the following assumptions exist:

1. High school students and their parents are sold on the benefits of industry recognized credentials when in reality the attainment of a credential may not lead to employment.
2. Secondary education has a responsibility to prepare students for direct workforce entry.
3. Funding organizations define industry-recognized credentials of importance, yet business and industry partners might not value or use credentials as a basis for employment.
4. School districts offer credentials of the lowest cost and do not consider employer demand.
5. Wisconsin does not accurately collect and report on credential attainment or related employment attainment.
6. Employers are not aware of the credentials offered in high schools.

Limitations of the Study

The following items are the authors perception of the limitations of this study:

- Wisconsin lacks a longitudinal data system; therefore, research specific to the relationship between credential attainment, postsecondary enrollment, and related employment was not possible. The data infrastructure does not exist to follow students from K-12 education into the workforce.
- For the past several years, data issues have existed with student information systems communicating IRC attainment with Wisconsin DPI. Several school districts in the state were unable to report student credential attainment.
- Per the CTE Incentive Grant Program, school districts can receive grant funding reimbursement for one IRC per student program guidelines. Therefore, if a student earns multiple IRCs, only one is reported. In addition, unless a school district completes the paperwork for reimbursement, it is unknown if any students in that district earned an IRC.

Definition of Terms

The following terms are relevant to this research and are defined here for clarityt.

Career and Technical Education

CTE is a broad term for education that combines academic and technical skills with the knowledge and training needed to succeed in today's labor market (Advance CTE, 2023).

Career and Technical Education Technical Incentive Grant Program

The intent of the legislation (Wis. Stats. 106.273) is to support and strengthen quality CTE programming that results in industry-recognized certifications that help to mitigate workforce shortages. The current approved CTE Technical Incentive Grant Certifications list

includes rigorous and valid certification programs that have value in an employer setting (Wisconsin Department of Public Instruction, 2023).

Career Cluster

The National Career Clusters Framework serves as an organizing tool for CTE programs, curriculum design and instruction. There are 16 Career Clusters in the National Career Clusters Framework, representing 79 Career Pathways to help learners navigate their way to greater success in college and career. The framework also functions as a useful guide in developing programs of study bridging secondary and postsecondary systems and for creating individual student plans of study for a complete range of career options. As such, it helps learners discover their interests and their passions, and empowers them to choose the educational pathway that can lead to success in high school, college, and career (Advance CTE, 2023).

Career Pathway

Career pathways are a series of connected education, training, and support strategies aimed at helping students achieve their own definition of success. Providing career pathways for students means that education and training align with the needs of the local job market, provide a range of secondary and postsecondary options, result in a secondary high school diploma, and help students enter or advance within an occupation (Wisconsin Department of Public Instruction, 2023).

Certificates

Certificates are typically granted by programs or institutions such as universities because of education focused on one topic but separate from a degree program (Credentials Matter, 2019).

Certification

A certification verifies that a professional has met a certain set of criteria for a skill or job as measured by a third-party assessment. This is issued by a business, trade association, or industry. Signal an individual has acquired a set of abilities and, in some cases, allow them to perform a specific job. Certifications are not a legal requirement but may open doors to entry-level jobs or help seasoned workers advance up the career ladder in their field (Credentials Matter, 2019).

Industry Recognized Credential

An industry-recognized credential is a verification of an individual's qualification or competence. Industry-recognized credentials are those that reflect the specific competencies needed for a given industry or occupational area. Credentials include training time required as a condition of hiring, which often results in certifications, licenses, or educational certificates and are part of the education, training, and experience requirements. (U.S. Bureau of Labor Statistics, 2023).

License

A license is verification by a government agency that an individual can perform a particular occupation. Mandated by law for workers to gain permission to practice in specific occupations and must be renewed periodically. Requirements vary by state and/or by licensing agency. (Credentials Matter, 2019).

Perkins V

The Strengthening Career and Technical Education for the 21st Century Act (Perkins V) was signed into law by President Trump on July 31, 2018. This bipartisan measure reauthorized the Carl D. Perkins Career and Technical Education Act of 2006 (Perkins IV) and continued

Congress' commitment in providing nearly $1.4 billion annually for CTE programs for our nation's youth and adults (PCRN: Perkins V, 2018).

Program of Study

Under Perkins V, the program of study is "a coordinated, non-duplicative sequence of academic and technical content" that incorporates state standards, addresses both academic and technical knowledge/skills, including employability skills, aligns with the needs of the local economy, progresses in specificity, beginning with all aspects of an industry and leading to occupation-specific instruction, and incorporates credentialing and culminates in a postsecondary credential (Mantick, 2019).

Workforce Investment Opportunity Act

The Workforce Investment Opportunity Act (WIOA) is a federal law that was enacted in 1998 as the Workforce Investment Act (WIA). It provides funding earmarked to provide employment services for employers, workers, and dislocated workers. WIA funds were available as well for qualifying dislocated workers to attend approved training in order to acquire new skills. The act was later revised in 2014 as the Workforce Innovation and Opportunity Act and is now referred to as the WIOA. The 2014 revision to WIOA brought strategic coordination of all federal programs related to the skill development of workers. The primary goal of WIOA is to ensure that training programs are coordinated so that both incumbent and prospective workers earn skills and credentials that meet the needs of employers (United States Department of Labor, 2017).

Chapter II: Literature Review

The literature on CTE, industry credentials and the economic marketplace stresses a common theme: the contradiction between CTE's purpose and value in helping students prepare for academic and occupational success in a fast changing, high-tech economy versus the declining number of students enrolled in CTE industry credential programs (Malkus, 2019). The purpose of this study was to determine the most in demand and valued IRCs by employers. The study aimed to address the significance of IRC attainment in high school with a goal to provide insight on better funding alignment to the most in demand IRCs. The following narrative will present the context that guides and impacts the purpose of this study.

According to a recent study completed by Education Strategy Group, “identifying industry-recognized credentials that are high value and differentiating them from those that do not provide a return on investment for credential earners is of paramount importance” (Education Strategy Group, 2018, p.2). Early research suggests that states are struggling with identifying IRC's that employers value in hiring, compensating, and promoting workers; which incentives for students, schools, and districts will lead to growing attainment rates; and a lack of access to data on credentialing attainment results which limits their ability to understand which credentials are being earned and by whom (Education Strategy Group, 2018).

The History of Industry Recognized Credentials in the United States

The first federal legislation on vocational education was the Smith-Hughes Act of 1917, which provided federal funds for state programs that taught agriculture, trades and industries, and home economics (Malkus, 2019). This act was designed to create offerings that would provide a labor force of skilled workers. The Vocational Education Act of 1963 marked a new and particular focus on students who were academically and economically disadvantaged, or

disabled (Malkus, 2019). The 1980s saw decreased vocational education participation due to an emphasis on academics after “A Nation at Risk” was published. The rebranding of CTE began with the Carl D. Perkins Vocational and Applied Technology Education Act Amendments of 1990 (Perkins II; Malkus, 2019).

Since the late 1980s, the United States has debated whether education adequately serves future workers’ needs and whether individuals entering the workforce possess the skills and knowledge required to perform well in the rapidly changing American workplace (Wilcox, n.d.). The National Skill Standards Act of 1994 established a National Skill Standards Board to serve as a catalyst in stimulating the development and adoption of a voluntary national system of skill standards and of assessment and certification of attainment of skill standards (Castellano et al., 2005). The major objectives of the act were to assist American businesses to compete more effectively in the global economy, help workers secure a firmer economic future and achieve higher standards of living, and assist educators in creating better and more up-to-date tools and curricula to teach future workers what they need to know to succeed in the working world (Wilcox, n.d.). While it existed, the board developed skill standards around 15 industry sectors. The National Skills Standards Board was a coalition of community, business, labor, education, and civil rights leaders and was tasked with building a national voluntary system of skill standards, assessment, and certification to enhance the ability of the United States workforce to compete effectively in the global economy (Castellano et al., 2005).

The decade of the 1990s saw an increase in the development of industry skill standards considered necessary for entry and success in various industries (Castellano et al., 2005). The Commission on the Skills of the American Workforce authored a report with several recommendations, calling upon business, labor, and education representatives to decide upon

certification standards for a broad range of occupations. Through the federal School to Work Opportunities Act of 1994, the federal government provided seed money for workforce development boards to develop these standards (Castellano et al., 2005).

Although IRCs existed prior to the Carl D. Perkins Career and Technical Education Act of 2006 (Perkins IV), it is this legislation that first created meaningful incentives for school districts to offer IRCs (Eagan & Koedel, 2021). Perkins IV provided funding for programs that (a) include rigorous academic and CTE content, with course sequences involving secondary and postsecondary education, (b) lead to an industry-recognized credential, postsecondary certificate, and/or degree, and/or (c) include dual credit/dual enrollment opportunities. Thus, IRCs continue to be emphasized by federal policy and incentivized through the provision of federal funding (Eagan & Koedel, 2021).

According to the U.S. Bureau of Labor Statistics (BLS), in 2019, 45.4 percent of civilian workers were required to have a credential, where 18.8 percent had a license requirement, and 1.8 percent had an educational certificate requirement (Bureau of Labor Statistics [BLS], n.d.). Among published occupational groups, credential requirements ranged from 13.3 percent for office and administrative support workers to 93.9 percent for healthcare practitioners and technical occupation workers (BLS, n.d.). BLS reported in 2018 that more than 43 million people in the United States held a professional certification or license. Burning Glass research has found that while there are nearly 2,500 distinct credentials requested in job openings across the nation, only 50 credentials account for two-thirds of all employer requests (Credentials Matter, 2019).

Workforce Readiness in Secondary Education

Each year, over 3 million students graduate from U.S. high schools (Credentials Matter, 2020). Whether they pursue postsecondary education or immediately enter the workforce, they will eventually enter a job market where an estimated 80% of good jobs require postsecondary credentials, according to the Georgetown Center on Education and the Workforce (Credentials Matter, 2020). Industry-recognized credentials suggest a student's career readiness because they validate the knowledge and skills required for success in an occupation or industry. According to the National Skills Coalition, full-time employees with an industry recognized credential earn more than their counterparts without one, and in some cases, the salaries of non-degree credential holders were found to be like workers with college degrees. As states work to increase the career readiness of their students, they can ensure that CTE offerings lead to the credentials valued most in their state's unique workforce.

Parents, policymakers, and much of the public worry that today's U.S. education system is not adequately preparing youth for life after high school. For decades, one of the most prominent approaches for ensuring that students are ready for the labor market has been providing them with career and technical education, once known as vocational education (Giani, 2022). Yet historical research finds that vocational education failed to live up to its promise: it stratified educational opportunity by race and class, reduced students' likelihood of attending college, diverted students from four-year to two-year colleges, and transitioned students into careers with limited opportunities for social mobility (Giani, 2022).

States and communities across the country have begun to recognize that non-degree credentials (in this case, industry-recognized credentials) have a significant role to play in education systems seeking to be more responsive to the new economy (Education Strategy

Group, 2019). Defining which credentials are of high value continues to be a question. With 26 states including industry-recognized credentials in their high school accountability systems and others contemplating whether such credentials should count toward their postsecondary attainment goals, the stakes have never been higher (Education Strategy Group, 2019).

One way that high schools can respond to increasing demand for career preparation is by helping students attain industry-recognized credentials (IRCs). Students earn IRCs most often through CTE, including "concentrating" in several related CTE courses (Giani, 2022). Obtaining an IRC in high school should lead to more employment opportunities. However, according to Giani (2022), we know almost nothing about whether IRCs better equip high school graduates to gain employment and earn a living wage, neither do we know whether IRCs earned during high school make it likelier that students will build upon them when choosing college majors (Giani, 2022).

Credential Attainment in Secondary Education

Giani (2022) stressed, "states, educators, and employers need to help students prioritize the credentials that will carry the most value in the workforce given the time and resource constraints inherent in schools" (p.7). This study examines how (IRCs) completed in high school affect students' later education and employment outcomes. The study uses individual-level data on more than one million students who graduated from public high schools in Texas from 2017 to 2019 to examine the relationship between earning IRCs and college enrollment and workforce outcomes. Through quantitative analysis and interviews with current and former students in courses that lead to IRCs, research in Texas found that many students see value in credentials apart from career plans (Giani, 2022). In focus groups, students often discussed the practical functions of IRCs, such as gaining general skills or pursuing a personal interest, in addition to the

value IRCs may have in the job market (Giani, 2022). The bulk of the report uses Texas's statewide longitudinal data system from the Texas Education Research Center, which includes individual-level data on nearly every public-school student, public and private college enrollee, and employee in Texas (Giani, 2022). In addition to quantitative data, interviews and focus groups were conducted with a dozen high school students in Texas further to contextualize the results (Giani, 2022). The conversations probed students' views of their CTE courses and programs, how they learned about IRCs and their experiences earning them, and their perceptions of the value of both CTE courses and the IRCs they earned or planned to earn (Giani, 2022). Giani (2022) concludes that the attainment of credentials is a "net positive but not a game changer" (p. 5). Research indicated that earning an IRC while in high school does provide value, but the value is likely not fully recognized until students' complete other relevant courses, apprenticeships, and on the job-experiences that span both high school and what comes after it (Giani, 2022). Information obtained during student focus groups revealed that students were aware of exams they had to take for certification but had varied levels of understanding of how to earn IRC's and why it was important to earn them. Giani is quoted as stating that this underscores the need to ensure that educators are informing students of opportunities to earn IRCs while they complete CTE programs and effectively preparing them to pass certifying exams (Giani, 2022). Giani cautions that IRCs earned by high school students are a steppingstone, not an endpoint. (Giani, 2022).

Education Strategy Group (ESG) recently developed a toolkit that lays out an evidence-based methodology that K-12, postsecondary, and workforce development leaders in any state can use to define credentials of value (Education Strategy Group, 2019). ESG recommends that leaders work across sectors to identify which non-degree credentials have value, knowing that

working in silos is inefficient and can send conflicting signals to students (Education Strategy Group, 2019). This demands that K-12, postsecondary, workforce development, and industry leaders undertake this work together to identify and validate the credentials demanded by the labor market in high-skill, high-wage occupations; incentivize learners to earn them; and reliably collect data and report which credentials are earned and by whom (Education Strategy Group, 2019).

A recommendation from ESG includes strategies to incentivize, communicate, and report on IRC attainment. A case study was presented on the Florida Career and Professional Education (CAPE) Act. The Florida Career and Professional Education (CAPE) Act was passed in 2007 to "provide a statewide planning partnership between the business and education communities to attract, expand, and retain high-value industry and sustain a strong, knowledge-based economy" (Education Strategy Group, 2019, p. 42). The Florida case study, which was organized around nine "key takeaways," highlights both best practices and potential challenges to consider for states interested in increasing and incentivizing credential attainment among students (Education Strategy Group, 2019). Incentivizing schools, students, teachers, and families were key takeaways. While all credentials on Florida's Industry Certification Funding List have demonstrated employer need, the actual value of individual credentials varies significantly. In both the articulation and funding processes, these differences are reflected in a tiered weighting system. Among credentials that qualify for articulated credit, the amount of credit awarded is stratified: Credentials that are more difficult to earn and/or more valuable in the labor market carry more postsecondary credit than others (Education Strategy Group, 2019). Within the school funding model and teacher bonus system, the weight of credentials is similarly stratified in accordance with its labor market value. Florida uses the amount of articulated credit each

credential carries as a proxy for determining labor market value, as labor market analyses are already embedded into the articulation process. Educators in Florida are also incentivized with bonus pay for each credential a student earns.

Data Systems for Credential Reporting

The collection of IRC completion data continues to be a topic of discussion. Finding real data about individuals possessing industry credentials and credentials in general has been equated to a "black hole" (Foster, 2013). Once collected, these data allow states to analyze the statewide landscape of credential offerings and attainment – in other words, the state's talent pipeline – and develop strategies to increase alignment, improve quality, ensure equity, and maximize return on investment across systems (Credentials Matter, 2020).

According to findings from the second phase of the Credentials Matter project in 2020, while many states indicated they are working to improve the link between their CTE programs and their labor markets, half of all states aren't collecting the necessary data to know how aligned their credential programs are with employer demand, and not a single state's secondary credential program measures as "highly aligned" with the job market (Credentials Matter, 2020). The research found that most states are relying on self-reported data versus data supplied by the vendors awarding the credentials. A recommendation from the research is to build a system where all credential data is collected directly from the vendor to ensure accuracy. States can establish data-sharing agreements with vendors of the state's valued credentials to directly collect individual student attainment data and eliminate or minimize self-reporting (Credentials Matter, 2020

The research resulted in four major findings related to credential data collection, definitions, employer signaling and alignment with labor market demand (Credentials Matter,

2019). Just over half of all states (28) collect quantitative data on the attainment of credentials; states do not have consistent definitions for what constitutes an industry-recognized credential—even though U.S. high school students earn hundreds of thousands of credentials each year; many credentials are not explicitly requested in employer job listings, despite the fact that the credentials may be required or desired for the position; and of the 24 states where data were available and analyzed, no state is highly aligned in terms of supply for credentials earned by high school students and the demand for those credentials in the job market (Credentials Matter, 2019).

One recommendation from Education Strategy Group is to build a cross-sector priority IRC list spanning the education and workforce systems that are backed by labor market data and have demonstrated postsecondary value. Education Strategy Group "recommends employers clearly state in their job postings and advertisements which IRC's are required or recommended for positions; use the IRC as a factor in selecting candidates for interviews and/or in determining which candidates are chosen for a job; offer higher pay for those who have earned an IRC; and/or use a common IRC within the same industry, providing portability across employers (e.g., a certification required by one auto manufacturer is also required by other auto manufacturers)" (Education Strategy Group, 2018, p.15).

Access and Equity

Student awareness of IRC opportunities must become a priority. If students are not aware of these opportunities and the employment opportunities they may provide, students are less likely to find them desirable. The employer community and higher education system must send clear signals about the credentials they care most about and that matter most to students (Education Strategy Group, 2018). Districts should communicate to students and parents that

earning an IRC can create the same employment and postsecondary enrollment opportunities as other college and career indicators.

The overarching themes of issues related to IRC's include access, equity, cost, employer recognition, and data. Until very recently, industry-recognized credentials earned in high school were not recognized as opening doors in the same way as other indicators of college and career readiness, such as dual enrollment, Advanced Placement, or International Baccalaureate, and thus were not prioritized by school systems (Education Strategy Group, 2018). To encourage the attainment of IRC's, districts should communicate and place value on the importance of IRC's just as they would for other indicators of college and career readiness.

Districts must also work to remove access barriers for students. States should expand access to credentialing exams and reduce the associated financial burden to make credential completion more feasible for students (Education Strategy Group, 2018). States should explore agreements with vendors to be able to offset the cost of the exam to students who cannot afford the fees.

Policy and Alignment

According to Rachel Vilsack of the National Skills Coalition, if America wants to build an inclusive economy where all workers and all businesses have the skills, they need to stay competitive in a rapidly changing global marketplace, everyone must work together to expand access, attainment, and transparency around quality non-degree credentials (Vilsack, 2021).

As states grapple with competing priorities and constrained resources, there is an increasing focus on efficiency and alignment of programs and resources across state agencies (Cushing et al., 2019). An example of this is the collaborative efforts of states to submit plans that combine the requirements and resources of the WIOA and Perkins plans.

Since the passage of the Strengthening Career and Technical Education for the 21st Century Act (Perkins V) in 2018, there has been a resurgence in research, policy activity, and school reform related to CTE (Giani, 2022). Increased alignment between education and workforce development occurred with the Strengthening Career and Technical Education for the 21st Century Act (Perkins V) and the Workforce Innovation and Opportunity Act. To support this alignment, the most recent versions of these laws align various policies, key definitions, and provide requirements and opportunities to coordinate cross-agency work. Perkins V and WIOA both place emphasis on the attainment of IRCs.

Every Student Succeeds Act (ESSA), Perkins V, Individuals with Disabilities Education Act (IDEA), and WIOA provide opportunities for states to develop a coherent approach to ensuring that all of today's students are prepared for tomorrow's careers and workforce demands (Cushing et al., 2019). Creating an education-to-workforce pipeline requires aligning implementation efforts across the four laws and their key stakeholders (Cushing et al.,2019). A better understanding of the state's labor market—through a process to identify credentials of value—is a meaningful step toward ensuring this alignment exists between education and workforce systems (Education Strategy Group, 2018). State leaders need to align labor market efforts with the education pipeline to provide students with the academic, technical, and employability skills they need to be successful in the workplace, which can help increase cost-efficiency, promote coherence, and produce better outcomes for students and workers (Cushing et al.,2019).

Overall, several consistent themes emerged from the myriad of educational reform reports and initiatives advanced over the past several decades. Prominent themes include the integration of academic and vocational education; emphasis on developing general (transferable)

work skills rather than focusing on narrow, job specific work skills; articulation between secondary and postsecondary vocational programs; adjustments in programs to accommodate changing workforce demographics; preparation for a changing workplace that requires fairly high-level academic skills; familiarity and use of high technology; higher order thinking skills including decision-making and problem-solving; and interpersonal skills that facilitate working in teams (Rojewski, 2002). Today, effective, high-quality CTE programs are aligned with college and career readiness standards and with the needs of employers, industry, and labor.

In November of 2022, The U.S. Department of Education announced the launch of Raise the Bar: Unlocking Career Success, a new Biden-Harris Administration initiative supported by the Departments of Commerce and Labor to increase and expand access to high-quality training programs to help young Americans pursue jobs in today's in-demand fields and be prepared for careers of the future (U.S. Department of Education, 2023). By 2030, this program establishes a goal that all high school graduates will have received their first industry recognized credential that demonstrates that they have the competencies and skills that employers are seeking (U.S. Department of Education, 2023).

According to recent report authored by Advance CTE and the Association of Career and Technical Education (ACTE), in 2022, 36 states enacted 123 policies affecting CTE and career readiness, including legislation, executive orders, and budget provisions that significantly changed funding. Policies that were passed affected the secondary education, postsecondary education, adult education and/or workforce development systems (Advance CTE, 2023). Advance CTE and Association of Career and Technical Education report that in the fifth most common policy area was industry recognized credentials with19 states enacting 23 policies. Policies in this area were designed to increase or incentivize the attainment of certifications,

credentials or degrees aligned with labor market information or industry need (Advance CTE, 2023). Examples include the requirement of credentials to be listed on a high school transcript, expansion of work-based learning programs, and student scholarships to earn a credential.

Texas, like Wisconsin, enacted legislation that directed the Texas Education Agency to publish a list of approved IRCs that are recognized and valued by employers and to factor students' receipt of such IRCs into the state's school accountability system (Giani, 2022). After soliciting extensive feedback from employers, workforce boards, and colleges, the Texas Education Agency constructed a list that consisted of credentials (presumably) aligned with high-wage, in-demand occupations that are to be periodically reevaluated. Students who complete an approved IRC in Texas are now deemed to be college, career, and military ready (CCMR) in the state school accountability ratings (Giani, 2022).

Employer Value of Industry-Recognized Credentials

Research by Education Strategy Group shared that states are struggling with identifying IRC's that employers value in hiring, compensating, and promoting workers; which incentives for students, schools, and districts will lead to growing attainment rates; and a lack of access to data on credentialing attainment results which limits their ability to understand which credentials are being earned and by whom (Education Strategy Group, 2018). Education Strategy Group set out to stress that identifying IRC's that are high value and differentiating them from those that do not provide a return on investment for credential earners, is of paramount importance (Education Strategy Group, 2018). Accurate and reliable data on credential completion, employer demand, and value of credential attainment will ensure that the right credentials are incentivized and prioritized.

There are numerous pathways to jobs. Among them are job applicants arriving at colleges and businesses with skills training and certificates from high school, technical schools, the military, and other endeavors. While billions of dollars are amassing into training and education resources, there is no real certainty that business and education leaders understand the training or its success in employability (Blivin, 2015). As a result, students are increasingly demanding the opportunity to demonstrate their talent in ways beyond traditional degrees (Gyll, 2021).

Education Strategy Group provided many recommendations for states as they navigate the process of identifying credentials of high value. Key recommendations include that states build stronger employer signaling analyses to identify the industry-recognized credentials that are valued by industry by using specific criteria, including the extent to which employers state in their job postings and advertisements which credentials are required or preferred for hiring; use the credential as a factor in selecting candidates for interviews and/or in determining which candidates are chosen for a job; offer higher wages for those who have earned the credential; and/or use a common credential within the same industry, providing portability across employers (Education Strategy Group, 2018).

High-quality, employer-backed, competency-based credentials can provide more precise information about job requirements and workers' proficiencies, particularly for the more technically skilled positions that make up an ever-increasing share of the U.S. labor market. A report from the Corporation for a Skilled Workforce states,

> "The meaningful engagement of business and industry is critical to the success of any credentialing effort. A credential must support competencies and learning outcomes directly aligned with business needs at the most basic level. However, for employers to believe that a credential has meaning—and thus be willing to use it—they must be

> genuinely involved in all parts of the credentialing process. For an expanded credentialing system to be effective, employers must view credentials as meaningful to their competitiveness and bottom line. Engaging employers upfront in identifying competencies is not enough – they must see value in the credentials for hiring purposes" (Laprade et al., 2015, p. 24).

Recent research cites employer confusion on credentials and the desire to be part of curriculum development. A survey of 510 individuals who hire, train, or offer development to employees within organizations that spanned financial services, health care, manufacturing, business education and other fields indicated when a job applicant lists a nondegree credential on their resume, close to half of employers do not know what to make of the program's quality (46 percent) and the acquired skills and competencies (42 percent) (D'Agostino, 2023). According to survey results, 65 percent of employers surveyed said they would collaborate with colleges to develop workforce credentials and gain information about program effectiveness, and deem employer engagement a necessity (D'Agostino, 2023).

University Professional Continuing Education Association (UPCEA) conducted a survey of professionals to better understand how employers perceive the use and validity of non-degree or alternative credentials in the workplace (Fong et al., 2023). Although many employers are recognizing the value of alternative credentials in today's workforce, a pervasive issue lies in the standardization of these credentials and how to accurately assess the validity and applicability of courses and certifications (Fong et al., 2023).

Key findings of the survey were that thirty-six percent of respondents said they are remarkably familiar with non-degree credentials, a third (33%) said they are extremely familiar, more than a quarter (26%) are somewhat familiar, and only 5% are not very familiar (Fong et al.,

2023). When asked which challenges or drawbacks their organization associates with a resume that includes non-degree or alternative credentials, respondents were unsure of the quality of education (46%) as well as the skills and competencies acquired (42%) (Fong et al., 2023). Employers stated they would like to be active in curriculum design and development, and work with institutions on developing alternative credentials (Fong et al., 2023).

Education Strategy Group states that navigating to a coherent list of industry-recognized credentials with labor market value will certainly be challenging for states, but it is even more challenging for students, parents, schools, and districts to wade through the thousands of industry credentials on their own and draw conclusions about which offer value. Students need targeted support to find their way through the maze of pathways from education into employment.

The Society of Human Resource Management (SHRM) recently conducted a survey of employers to learn how they view and value industry recognized credentials in the workplace. The research found that many human resource professionals and other business leaders have been slow to understand, accept and integrate alternative credentials into their talent strategies (Society of Human Resource Management, 2021).

The labor market expects workers to have some type of post-secondary education or training. If states cannot identify credentials of the highest value to employers, attainment goals and accountability metrics could drive students and returning adult learners to unwittingly pursue lower-value credentials that do not lead to good jobs (Education Strategy Group, 2018).

Employer Demand of Industry Recognized Credentials

The National Skills Coalition (NCS) is an organization made up of business, industry, education, and policy experts fighting for a national commitment to policies that expand high-quality skills training, reflect people’s real and valid career aspirations, and support industry’s

urgent need for an inclusive, skilled workforce (Vilsack, 2021). According to the National Skills Coalition, it is imperative that students, working adults, and people undergoing career transitions know what training will help them succeed in growing industries and to understand which credentials will help them upgrade their skills to find work in the new economy (Vilsack, 2021). Yet with one million unique credentials issued in the United States and well over 50,000 providers, navigating information about credentials and their outcomes to choose the most promising pathway could prove to be a daunting challenge for an individual (Vilsack, 2021). Now more than ever states need to define what makes a quality credential, so adult learners have a clear and successful pathway to the training programs needed to get better jobs (Vilsack, 2021).

> Vilsack (2021) stated, "If America wants to build an inclusive economy where all workers and all businesses have the skills, they need to stay competitive in a rapidly changing global marketplace, everyone must work together to expand access, attainment, and transparency around quality non-degree credentials" (p. 2).

Vilsack identified four key criteria for defining quality non-degree credentials. These include evidence of job opportunities associated with the credential, evidence of competencies mastered by credential holders, transparent evidence of earning and employment outcomes of individuals who earn a credential, and stack ability to additional education and training (Vilsack, 2021). An emphasis on reliable data is critical to ensuring that quality assurance definitions are student-focused and provide learners with the necessary information to make informed decisions about their employment and earnings goals (Vilsack, 2021).

Labor Market Value of Industry Recognized Credentials

Credentials Matter, a partnership between ExcelinEd and Burning Glass Technologies, is a first-of-its-kind analysis which examines how the credentials students earn align with real-

world employer demand (Credentials Matter, 2019). This project illustrates the credentials available and highlights the outcomes of credential attainment to inform key policy decisions about which pathways and associated credentials lead to middle- and high-wage employment opportunities and continued career advancement for students (Credentials Matter, 2019). The project has been collecting data from 30 states who have some type of mechanism to collect IRC data, including Wisconsin. This two-phase project began in May of 2019 with the launch of CredentialsMatter.org, an interactive website with the most extensive collection and analysis of supply, demand, and alignment of industry recognized credentials in states to date (Credentials Matter, 2019).

Determining the labor market value of a credential is a difficult task. The research shows that some credentials may be in high demand, but do not lead to a living wage and may decline over time (Credentials Matter, 2019). Another component of determining value is if employers are identifying credential requirements in job postings. External involvement by industry is meant to signal to prospective employers that an applicant has acquired at least some skills required for a specific position or occupation. Yet it is unclear how well this works in practice. What little research has been done on such credentials provides grounds for concern, as do the seemingly questionable incentives tied to them in states' accountability systems, as many of those systems prioritize quantity (number of IRCs obtained) over quality (Giani, 2022). ExcelinEd and Burning Glass have furthered their work with a goal to help states understand the broader landscape of offerings and outcomes and tackle key questions about the "value" of industry recognized credentials to both employers and students (Credentials Matter, 2019). Phase one recommendations include identifying state priorities and establishing definitions, aligning state policy, and improving data collection (Credentials Matter, 2019). In September of 2020, the

project released its next phase of research to include updated credential attainment data and expanded research to include credentials earned at the postsecondary level. The expanded research focused on identifying the number of states collecting data student credential attainment, what credentials were being earned by students and how they aligned with employer demand, and how states were supporting credential attainment through policy and funding. Overall, there were minimal changes in alignment scores across states that collected data in both Phase 1 and Phase 2 (Credentials Matter, 2020). A key finding was the prevalence of low and moderate state alignment reflects that many of the credentials earned by K-12 students carry little currency with employers, and therefore offer questionable career value to students (Credentials Matter, 2020).

Establishing a list of approved credentials was completed by most states. Thirty-five states said they maintain an approved list of K-12 industry-recognized credentials while 11 said they didn't (Credentials Matter, 2020). States indicated that they developed their lists of approved credentials in partnership with employers, workforce and labor organizations, and higher education partners. Most states include credential attainment in accountability systems, but do not include them as part of a graduation requirement or special graduation designation (Credentials Matter, 2020). However, states that establish inconsistent expectations and "lists" of qualifying (valued) credentials across various accountability and graduation policies risk creating competing priorities that may lead to perverse incentives that drive students to earn credentials that are not valued by employers (Credentials Matter, 2020). Researchers recommend that states should consider prioritizing the value of credentials in their funding and incentive structures.

Ensuring that all stakeholders are provided with information about credentials can help in decision making. Research found there is not a single source of complete information about the

potential opportunities, costs, and benefits of each credential (Credentials Matter, 2020). States can play an important role in engaging stakeholders to synthesize and disseminate actionable and consistent information about the value, benefits, costs, risks, and opportunities associated with each credential – and the larger role that credentials play in students' college and career readiness (Credentials Matter, 2020).

The report provides specific recommendations for the state of Wisconsin which include improvement of data collection, increasing alignment across K-12 and postsecondary systems, expand access and improve outcomes and clearly communicating the value of credentials across sectors and audiences (Credentials Matter, 2020). Review of credentials and programs consistently will help reduce credential oversupply and undersupply.

Research found that in many cases, state education agencies promote and include measures of knowledge and skills in their industry recognized credential lists that are not valued by employers (Credentials Matter, 2019). Many of these include CTE assessments and general career readiness credentials. Of the approximately 780,000 credentials earned, over a quarter are general career readiness credentials, which often carry little to no weight in the labor market (Credentials Matter, 2019). With better information, they would be able to pursue higher-value credentials that help them advance toward their long-term goals rather than spending their time earning credentials that are not in-demand or don't lead toward middle- and high-wage careers (Credentials Matter, 2020). Research found that oversupply of credentials that are not demanded in the labor market is the most significant source of misalignment (Credentials Matter, 2019).

As America's key industries offer high salaries in return for candidates with the necessary abilities and credentials to fill their vacancies, the knowledge, skills, and third-party industry credentials earned in secondary CTE programs seem a close match (Hendricks et al.,

2021). A recent study of CTE and credentials in Virginia sought to determine the outcomes of students who participated in CTE programs and earned an industry recognized credential and if wages were higher for individuals who had an industry recognized credential in the state of Virginia. The authors referenced “credential confusion” that exists due to over 5,000 certifications available for high school students. This is a concern as students struggle to determine what may be the best credential to earn for their field (Hendricks, et al., 2021).

The study found that there were many inconsistencies between states specific to requirements and outcomes and found that most credentials earned were soft skill certifications. Ironically, these “soft skills” certifications might undermine state efforts to promote “credentials of value” (Hendricks, et al., 2021). By meeting the Perkins-required “quality indicator” through increased numbers of “soft skill” certifications rather than having students complete three or more credits within a single CTE pathway and earning industry-recognized credentials that the labor market needs and rewards, educators may be “checking an accountability box” but shortchanging students (Hendricks, et al., 2021). The implications of this research enable policymakers, school leaders, and CTE advocates to reshape popular misperceptions of CTE and industry credentials, enhance high school students’ career and postsecondary education outcomes, and add to state treasuries (Hendricks et al., 2021). This study also adds to the literature about CTE’s role in their region and state’s labor market and for individuals’ prospects for well-paying work and lifelong learning (Hendricks et al., 2021

Nationwide data from Credentials Matter showed that six of the top ten credentials earned are very over supplied (Credentials Matter, 2019). In fact, only 18 percent of all credentials earned by high school students are considered in demand. Of the ten credentials most demanded by employers that are earned by students in high school, only three credentials—

Microsoft Office Specialist, Adobe Certified Associate and Automotive Service Excellence Certification—appear on both the top 10 credentials earned list and the top 10 credentials demanded list (Credentials Matter, 2020). In Wisconsin, the top career clusters that students are earning credentials in are health science, human services, education and training, agriculture, food, and natural resources, and manufacturing. In Wisconsin, only 9% of total credentials earned are considered in demand. Overall, the state is cited as low alignment of credential attainment to employer demand. The top credentials earned by high school students are Wisconsin Assistant Childcare Teacher, Certified Nursing Assistant, Microsoft Office Specialist, and Youth Apprenticeship.

In summary, the Credentials Matter research provides specific information on findings for identified key stakeholders. Key stakeholders include policymakers, educators and administrators, employers, credentialing bodies, and students and families. Findings of this research can help inform efforts and strengthen policies to provide high-quality career pathways, including attainment of high-value industry-recognized credentials; provide a view of what students currently earn as well as an opportunity to communicate more effectively with educators and potential employees about credentials that carry value; highlight the need to ensure local CTE programs are aligned with state and regional workforce needs and that each pathway leads to credentials that carry the highest value among employee; emphasize the opportunity to collaborate with states and educational institutions to improve data collection and reporting related to industry credential attainment; and can serve as starting point for conversations about which credentials can provide the greatest benefits for a future career and long-term success (Credentials Matter, 2020).

Chapter III: Method and Procedures

This chapter will outline the method and procedures used to complete this study. This study aimed to determine the most in-demand and valued IRCs by employers and compare that to what students earn in high school. There is a gap in the research on employer perception of the attainment of industry-recognized credentials in the secondary system. The goal of completing this study was to provide insight on better funding alignment to the most in-demand IRCs, and determine which IRCs were of the highest value to employers. This chapter reviews the research problem, the purpose of the study, research questions, a description of the sampling strategy, data collection procedures, and analysis.

The research answers the following questions:

1. What are the most in-demand Industry Recognized Credentials sought by employers?
2. To what degree do employers value credential attainment in the secondary system as a means of preparing students for the workplace?
3. Which credentials are currently being earned by students, and how do those credentials align with employer demand?

Research Methodology

This study employed a mixed methods approach by collecting qualitative and quantitative data simultaneously. Convergent mixed methods are a form of mixed methods design in which the researcher converges or merges quantitative and qualitative data to provide a comprehensive analysis of the research problem (Creswell & Poth, 2018). In this design, the investigator typically collects both forms of data at roughly the same time and then integrates the information in the interpretation of the overall results (Creswell & Poth, 2018). The research was conducted as a single-phase study where both quantitative and qualitative data were collected, reported, and

analyzed separately. Convergent design was utilized and occurs when “the researcher intends to bring together the results of the quantitative and qualitative data analysis so they can be compared or combined” (Creswell & Clark, 2017, p. 65). The intent of convergent design is “to obtain different but complementary data on the same topic” (Creswell & Clark, 2017 Through the distribution of an online survey instrument, the researcher collected both quantitative and qualitative data.

Population and Sample

Wisconsin employers were given the opportunity to provide feedback and complete the online survey for the quantitative and qualitative portions of the study. The researcher analyzed IRC completion data collected through publicly available listings of credential attainment from the Wisconsin DPI/DWD for 2021 high school graduates. This data is housed on the public website of the Wisconsin Department of Public Instruction. This data identified the number of credentials awarded by the school district, and the type of credential earned. This data was used to determine what credentials students are earning and how they align to survey responses from employers.

Research Design

This study utilized a qualitative case study approach on the value of IRCs held by identified stakeholders and the relationship of that to employer and industry demand. According to Creswell, qualitative research is employed because a problem or issue needs to be explored and a lack of fit to a quantitative study is absent and a complex detailed understanding of the issue was needed (Creswell & Poth, 2018). In addition, a case study approach aligns well with a mixed methods study. A case study approach “is an in-depth examination of a particular case or several cases” (Creswell & Poth, 2018, p.91)

According to Creswell, in a mixed-methods study, both quantitative and qualitative data together will provide a better understanding of the research problem than either type alone (Creswell & Clark, 2017). Qualitative research begins with assumptions and the use of interpretative and theoretical frameworks that inform the study of research problems addressing the meaning individuals or groups ascribe to a social or human problem (Creswell & Poth, 2018). The theoretical framework of this research aligned with a pragmatism framework. The final written report or presentation of qualitative research includes the voices of participants, the reflexivity of the researcher, a complex description and interpretation of the problem, and its contribution to the literature or call for change (Creswell & Poth, 2018, pg.44). The research occurred in a natural setting. Multiple methods were used to organize data. This included surveys and publicly available IRC completion data.

A sample of employers from across Wisconsin included small and large employers. Employers were selected from those who have participated in K-12 activities and have been actively engaged in career pathway development and curriculum guidance. Employers from various sectors were selected for the survey including advanced manufacturing, architecture and construction, arts, A/V, and communication, business management, administration, and finance, healthcare, and information technology. Employer listings were obtained from nine Wisconsin Regional Economic Development Organizations, 12 Cooperative Educational Services Agencies (CESA), eight Regional Career Pathway State Employer groups, and INSPIRE Wisconsin partners. After the surveys were completed, quota sampling was employed to select responses based upon industry groups. This provided a greater level of detail specific to the industry sector. An invitation email to complete the survey was sent to 257 employers in Wisconsin. The survey

remained open for 14 days. A follow up email was sent one week following the initial invitation to complete the survey. A total of 86 employers responded to the survey.

The researcher identified potential issues specific to the research topic. Being proactive in the approach and realizing that other effects are causing employers to answer questions differently than they may have in the past, is something the researcher was aware of. For example, it is important to understand and highlight in the literature review, current hiring practices of Wisconsin employers. Are credentials outdated? Is higher education, specifically technical college education programs that award IRCs, not as relevant as they had been? Being aware of the current economic factors affecting hiring of employees, teacher credentialing, secondary facilities and resources, and K-12 budgets were all considerations in the research. To address questions about the rates of IRC acquisition and factors associated with them, the researcher used descriptive statistics to identify the most common IRCs awarded.

According to research (George, 2021) mixing methods allow you to put findings in context and add richer detail to your conclusions. Using different methods to collect data on the same subject can make your results more credible and strengthen the validity of the analysis.

Combining the two types of data means you benefit from both the detailed, contextualized insights of qualitative data and the generalizable, externally valid insights of quantitative data (George, 2021). In research from George (2021), the strengths of one type of data often mitigate the weaknesses of the other. Adding qualitative data deepens and enriches your quantitative results. Below are examples of what could contaminate my research and how it was addressed:

- Population studied: It was imperative to survey employers who understood IRCs.

- The sample used: The researcher focused on a sample from Wisconsin. This comes with caution as what happens in Wisconsin may not happen in Illinois or other neighboring states.
- Selection error: Suppose only manufacturing employers responded to the survey, and employers from other sub sectors did not respond. This would create a selection error. By ensuring the researcher surveyed all employers and obtained results from all employers (regardless of sub sector), she ensured she did not have selection error.
- Nonresponsive or absence of data:
- Measurement error: If the researcher only surveyed healthcare employers, or if most respondents are healthcare employers, measurement error will occur. This is because most healthcare positions require a credential or license. The researcher must ensure that she did not rely on responses of healthcare employers only because the measurement would not be accurate.

Instrumentation

After the researcher received Institutional Board Review (Appendix A) approval, an online survey was distributed to answer open-ended questions. Employers completed the survey. The researcher did not use random sampling, but rather purposive sampling. This type of sampling is used by selecting individuals that the researcher believes will be reliable sources of information. Survey questions were built on the premise of value, offerings, and employer input. The researcher designed the survey instrument to collect data on current and future workforce credentials in demand by employers.

The researcher surveyed Wisconsin employers to learn about the demand and value of industry recognized credentials (IRC) that can be earned in high school. Employers representing

a variety of industry sectors were asked to complete the survey. This included Advanced Manufacturing; Architecture and Construction; Business Management, Administration, and Finance; Information Technology; Healthcare; Hospitality and Tourism; Arts, A/V Technology, and Communications; and Early Childhood Education. The researcher provided a listing of current credentials that are included in the CTE Incentive Grant and had respondents rate the value and demand of each IRC. Respondents selected "Required, Preferred, Not Considered, and Not Familiar With" when rating the IRC listing. The researcher also asked about familiarity with a state-funded program that provides reimbursement for IRC completion while in high school. The researcher asked several open-ended questions that included an opportunity for an employer to identify an IRC that was not listed. The full survey can be found in Appendix B.

As part of research question one and two, the research questions were answered through the survey instrument that the researcher developed. Qualtrics, a web-based software tool allowing users to create surveys and generate reports, was used to conduct all surveys, and generate findings. To ensure adequate response rates and participation among the sample population, follow-up emails were sent one week after the initial email.

Reliability and Validity

The reliability of survey responses presents issues. For example, if an employer has a certain partnership with a third-party vendor, or a high school has a sponsorship from a specific employer who values a certain credential, and another employer doesn't: how reliable are those results? To mitigate reliability issues, the researcher needed to have a large enough sample of employers from each sub sector to obtain reliable results. Employers from across the state in identified industry sectors were surveyed to ensure a large enough sample size representing all industry sectors.

Validity, according to Patten and Newhart (2017), researchers call a measure valid to the extent that it measures what it is designed to measure and accurately performs the function(s) it is purported to perform (p. 123). Measuring value is challenging to do, but if the survey instrument is designed well, the result is a high level of face validity. For example, in the survey, the researcher asked direct questions. Empirical validity is also known as predictive validity. For example, this was used to predict that students who earn a certain credential would obtain related employment. Construct validity, according to Patten and Newhart (2017), is hypothesizing about components that make up the construct they wish to measure (p. 133). In this example, the researcher hypothesized that school districts offer students credentials based on teachers' credentials.

Research Questions

Research question 1 asked “What are the most in-demand industry recognized credentials sought by employers?” The researcher used empirical validity. Reliable data from employers was obtained to prove that earning a certain credential directly relates to employment. For example, a nursing assistant is required to complete a class and earn a state license.

Research question 2 asked “To what degree do employers value credential attainment in the secondary system as a means of preparing students for the workplace?” The researcher employed a combination of face validity and predictive validity. This is a two-part research question. Employers were asked what makes an industry recognized credential valuable and what is preventing wider acceptance of industry recognized credentials. The researcher hypothesized that value varied by industry sector employer perspective.

Research question 3 asked “Which credentials are currently being earned by students, and how do those credentials align with employer demand?” The researcher used face validity. If an

employer is defining a certain credential as valuable, but students don't have access to it, finding out why is important.

Data Collection Procedures

In this section, the researcher provides an overview of data collection. First, the researcher presents detailed data on steps taken to collect stakeholder contact information prior to officially collecting data. The researcher presents specifics on how data were collected through a combined quantitative and qualitative survey instrument distributed through electronic emails.

The investigator went through UW-Stout's Protection of Human Subject Training before conducting the study. The next step was to locate specific contact information for each stakeholder group member. Due to the researcher's current position at Fox Valley Technical College in Wisconsin and past statewide project management that included business partnerships, the researcher created an initial listing. In addition, the researcher utilized the Wisconsin Workforce Development Board to share the survey with the membership. Qualtrics electronic surveys were sent to 257 businesses in Wisconsin. The introductory email (Appendix C) included a summary of the value of the research on industry-recognized workforce credentials. Further, the introductory email provided information on the purpose of the research, date the electronic survey would be closed, security of data, protocol to ensure anonymity of respondents, dissemination of survey results, and option to reject participation in the survey.

The researcher pursued multiple streams of data collection. The first step in the research project was to create the survey questions (Appendix B). Questions were developed to obtain ordinal-level data on value and demand related to IRC attainment from employers. As part of the data collection for the research, the researcher collected both formal and informal data. Formal

data consisted of publicly available IRC completion data by IRC type and survey responses from employers. Informal data consisted of a series of open-ended survey questions where employers could provide feedback. Thematic analysis was utilized for those questions.

Surveys and Documents

The researcher utilized a comprehensive approach that included surveys and document review to help gain more in-depth knowledge about employers' demand for industry-recognized credentials and the value placed upon them. The researcher designed the survey to identify participants' views on the value of industry-recognized credentials and in-demand credentials needed by employers in Wisconsin. The researcher considered open-ended questions essential because respondents were not only asked about current credential needs, but they were also asked to indicate what makes a credential valuable. A survey instrument is best for collecting data on attitudes, observations, and perceptions. The quantitative data were statistically analyzed and interpreted by the researcher. Four open-ended questions were analyzed and reported within each survey using thematic reduction and focused coding.

Documents reviewed included the Wisconsin CTE Incentive Grant Program eligible credentials listing (Appendix C) for reimbursement to school districts and the 2022 listing of completed credentials by high school graduates. Both listings are publicly available on the Wisconsin DPI and DWD website and identifies the type and number of IRC's earned in Wisconsin high schools. The approved credentials list from Wisconsin DPI/DWD was also used to generate survey questions. Each school year, an updated list of approved certifications is published by Wisconsin DPI/DWD. The list includes all the certifications that are approved for that school year and is used by school districts for planning purposes. Districts are only able to claim dollars for students who have graduated high school. For instance, a graduate of the class

of 2022 may have earned a certification in 2020. To be eligible for the funding, the school district should refer to the list from the class of 2020 and see if the certification had been approved for that year and what the documentation requirements are. If the certification were not approved for the class of 2020, it would not be eligible for grant funding.

Nominal variables were credential content area, certifying entity, credential type earned by DPI/DWD, defined industry sector, and IRC workforce demand. Ordinal variables were employer value and employer ranking of credentials by required, considered, not considered, and not familiar with. Both nominal and ordinal data were analyzed by descriptive statistics.

Data Analysis

In qualitative analysis, there is no right or wrong way to analyze the data. Lichtman (2012) shared that as a qualitative researcher, your task is to organize and make sense of the data. In qualitative research, data comes from words or pictures, and key concepts are derived from the data through a process of coding, sifting, sorting, and identifying themes (Lichtman, 2012, p.243). Lichtman (2012) explains this process as dissecting and categorizing the stories. The process involves researchers assigning codes to the content, which are then organized into categories, and then the categories are organized into concept or themes (Lichtman, 2012, p.252).

Gill (2014) describes the van Manen approach as a four-step process. This includes: “a researcher conducts thematic analyses to determine the themes or experiential structures that make up an experience, a researcher describes the phenomena through the art of writing, a researcher maintains a strong and oriented relation to the phenomenon, and a researcher balances the research context by considering the parts and whole” (Gill, 2014, p.124).

Thematic analysis or narratives can be used to analyze the information. Lichtman (2012) outlined the process of thematic analysis as “the three C’s-coding, categorizing and concepts

(p.252). Lichtman shared that the goal in the three C's analysis is to move from coding initial data through identification of categories to the recognition of important concepts or themes (Lichtman, 2012, p.254)

Quantitative data was analyzed using descriptive statistics. The purpose of descriptive statistics is to analyze a data set. Data was analyzed to determine credentials that were most in demand. A table was completed to provide a visual of the results for each industry sector. Parallel databases variant is a common approach in which two parallel stands of data are collected and analyzed independently and are only brought together during the interpretation (Creswell & Clark, 2017, p.73). By using this approach, the researcher reviewed current IRC credential attainment and compared that to employer value and demand.

Chapter IV: Presentation of the Findings

To evaluate the value and demand of industry-recognized credentials earned at the secondary education level in Wisconsin, a study was conducted to obtain the employer perspective on credential attainment. The study was guided by the following research questions:

1. What are the most in-demand Industry Recognized Credentials sought by employers?
2. To what degree do employers value credential attainment in the secondary system as a means of preparing students for the workplace?
3. Which credentials are currently being earned by students, and how do those credentials align with employer demand?

The study incorporated both quantitative and qualitative data collection. This chapter presents the results of the data collection.

An invitation email was sent to 257 employers in Wisconsin to complete the survey. The survey remained open for 14 days. A follow-up email was sent one week following the initial invitation to complete the survey. A total of 86 employers responded to the survey. This represents a 33.4 percent response rate. All respondents agreed to the informed consent.

Several survey questions were not specifically linked to a research question but helped set the stage for understanding credentials. When asked if an employer would provide pay increases for credential completion, 44 percent of respondents indicated no, while 56 percent of respondents indicated yes. According to survey results, credentials play an important role in hiring or promoting an employee. In fact, 45 percent of employers indicated the lack of a credential limits the ability to hire for occupations in their industry.

Demographic Data

Data for this research consisted of survey responses from Wisconsin employers. A total of 86 employers responded to the survey. Most employers (84%) who responded represented businesses that employ over 50 individuals. To maintain the anonymity of respondents, names of respondents and companies were not collected. Participants identified the industry sector they best aligned with (Table 1). Participants who aligned with multiple industry sectors did not complete this question.

Table 1

Employer Response by Industry Sector

Industry Sector	%	Participants
Architecture and Construction	15.79	9
Business Management, Administration, Finance	8.77	5
Healthcare	40.35	23
Hospitality and Tourism	5.26	3
Advanced Manufacturing	26.32	15
Arts, A/V Technology, and Communications	0.00	0
Information Technology	1.75	1
Early Childhood Education	1.75	1
Total	100	57

Findings by Each Overarching Research Question

The following will detail the findings of each research question.

Research Question 1

Research question 1 asked "What are the most in-demand industry recognized credentials sought by employers?" Question 1 involved the collection of quantitative data from employers in Wisconsin. The survey provided a credential listing by industry sector. The credential listing was developed by the Wisconsin DPI/DWD and is used for the CTE Incentive Grant Program. School districts *that* have students' complete credentials on the list are eligible for grant funding. The researcher provided *a* list that was organized by industry sectors. The first question asked of participants was if they were familiar with the CTE Incentive Grant Program in Wisconsin. Results indicated that 75 percent of respondents were unfamiliar with the program, while 25 percent were familiar with it. The researcher asked employers if they participate in a business and education partnership and 73 percent of respondents indicated they do.

The following questions had employers rate industry recognized credentials by required, preferred, not considered, or not familiar with. Employers were asked to only rate the area in which they would employ people. Several employers were able to rate multiple industry sectors due to the nature of the occupations they employ. In addition, employers were provided the opportunity to identify credentials that were not listed. The industry sectors were Advanced Manufacturing, Architecture and Construction, Arts, A/V Technology, and Communications, Business Management, Finance, and Administration, Health Science, and Hospitality and Tourism. The following is a descriptive analysis of employer responses by industry sector.

Advanced Manufacturing Industry Recognized Credentials

Employers were asked to rate 25 Advanced Manufacturing credentials. These credentials are currently eligible for school district reimbursement through the Wisconsin CTE Incentive Grant program. Commercial Driver License (CDL) was identified as the highest ranked credential by employers. Other than CDL, over 70 percent of the credentials listed were not considered or respondents were not familiar with them. Table 2 reflects the highest rated credentials that were required or preferred by employers.

Table 2

Advanced Manufacturing Industry Recognized Credentials

Certification	Required %		Preferred %		Not considered %		Not familiar with %		Total
Commercial driver license (CDL)	13.64	6	29.55	13	25.00	11	31.82	14	44
SolidWorks: Certified solidworks professional (CSWP)	2.44	1	12.20	5	24.39	10	60.98	25	41
SolidWorks: Certified solidworks associate (CSWA) – Academic	2.44	1	12.20	5	24.39	10	60.98	25	41
Autodesk AutoCAD	2.33	1	27.91	12	27.91	12	41.8	18	43
MSSC: Certified production technician (CPT) full program	0.00	0	2.38%	1	21.43	9	76.19	32	42
MSSC: CPT - Safety Module	0.00	0	4.76	2	19.05	8	76.19	32	42
Level I SENSE/Entry Welder	0.00	0	11.90	5	26.19	11	61.90	26	42

Certification	Required %		Preferred %		Not considered %		Not familiar with %		Total
MSSC: CPT - Quality practices & measurement module	0.00	0	7.14	3	19.05	8	73.81	31	42
Autodesk inventor- Imperial or metric	0.00	0	7.14	3	30.95	13	61.90	26	42
MSSC: CPT - manufacturing processes & production module	0.00	0	4.76	2	21.43	9	73.81	31	42
Autodesk Maya	0.00	0	2.38	1	23.81	10	73.81	31	42
MSSC: CPT maintenance Awareness	0.00	0	7.32	3	21.95	9	70.73	29	41
Autodesk fusion 360	0.00	0	2.38	1	26.19	11	71.43	30	42
MSSC: CPT green production	0.00	0	2.38	1	19.05	8	78.57	33	42
National institute for metalworking skills (NIMS): Any level 1 or level 2 certification	0.0	0	7.14	3	23.81	10	69.05	29	42

Certification	Required %		Preferred %		Not considered %		Not familiar with %		Total
HAAS CNC certification	0.00	0	12.20	5	21.95	9	65.85	27	41
Smart automation certification alliance (SACA): C-101 certified industry 4.0 associate basic operations	0.00	0	9.52	4	23.81	10	66.67	28	42
Autodesk 3dsMax	0.00	0	2.44	1	24.39	10	73.17	30	41
SACA: C-104 Certified industry 4.0 associate IIoT data analytics	0.00	0	7.32	3	24.39	10	68.29	28	41
SACA: C-103 certified industry 4.0 associate robot systems	0.00	0	9.76	4	24.39	10	65.85	27	41
SACA: C-102 certified industry 4.0 associate advanced operations	0.00	0	11.90	5	23.81	10	64.29	27	42
master service technician briggs and stratton corporation	0.0	0	6.98	3	25.58	11	67.44	29	43

Certification	Required %		Preferred %		Not considered %		Not familiar with %		Total
Autodesk REVIT- imperial or metric	0.00	0	20.93	9	25.58	11	53.49	23	43
HVAC excellence - any employment ready certification	0.00	0	16.28	7	34.88	15	48.84	21	43
FANUC certified robot operator 1	0.00	0	14.63	6	19.51	8	65.85	27	41

Architecture and Construction Industry Recognized Credentials

Employers were asked to rate six credentials in relation to architecture and construction. Over 50 percent of respondents were not familiar with the credentials listed. Of those listed, HVAC Excellence, North American Technician Excellence Certification HVAC Support Technician, and International Carpenters Training Fund: Career Connections Level 3 Certificate were the highest-ranked credentials.

Table 3

Architecture and Construction Industry Recognized Credentials

Credential	Required %		Preferred %		Not Considered %		Not familiar with %		Total
HVAC excellence	0.00	0	15.00	6	37.50	15	47.50	19	40
North American technician excellence certification: HVAC support technician	0.00	0	15.00	6	30.00	12	55.00	22	40
International carpenters training fund: Career connections level 3 certificate	0.00	0	12.82	5	28.21	11	58.97	23	39
National center for construction education & research	0.00	0	10.26	4	30.77	12	58.97	23	39
North American building trades council: Multi-craft core curriculum (MC3)	0.00	0	7.69	3	33.33	13	58.97	23	39
Woodwork career alliance: Sawblade	0.00	0	5.13	2	30.77	12	64.10	25	39

Arts, A/V Technology, and Communications Industry Recognized Credentials

Employers were asked to rate six credentials in this industry sector. Adobe Certified Professional InDesign was ranked the highest. Over 50 percent of respondents were not familiar with the credentials.

Table 4

Arts, A/V Technology, and Communications Industry Recognized Credentials

Certification	Required %		Preferred %		Not Considered %		Not familiar with %		Total
Adobe certified professional: Photoshop	2.56	1	7.69	3	38.46	15	51.28	20	39
Adobe certified professional: Premiere pro	2.56	1	7.69	3	33.33	13	56.41	22	39
autodesk: Maya	0.00	0	2.63	1	23.68	9	73.68	28	38
Autodesk: 3dsmax	0.00	0	2.63	1	23.68	9	73.68	28	38
adobe certified professional: Illustrator	0.00	0	10.26	4	35.90	14	53.85	21	39
adobe certified professional: InDesign	0.00	0	15.38	6	33.33	13	51.28	20	39

Business Management, Finance, and Administration Industry Recognized Credentials

Employers were asked to rate seven credentials related to business management, finance, and administration industry sectors. Microsoft Office Specialist (MOS) was ranked the highest by employers.

Table 5

Business Management, Finance and Administration Industry Recognized Credentials

Credential	Required %		Preferred %		Not considered %		Not familiar with %		Total
Microsoft office specialist (MOS)	5.00	2	30.00	12	25.00	10	40.00	16	40
Intuit-quickBooks	5.13	2	15.38	6	30.77	12	48.72	19	39
Certified user google workspace	0.00	0	17.95	7	41.03	16	41.03	16	39
A*S*K business institute: Concepts of finance	0.00	0	5.13	2	25.64	10	69.23	27	39
A*S*K business institute: any business or marketing certificate	0.00	0	2.56	1	17.95	7	79.49	31	39
center for financial training through American banking association-customer service representative	0.00	0	2.56	1	20.51	8	76.92	30	39
Center for financial training through American	0.00	0	0.00	0	21.05	8	78.95	30	38

banking association-bank teller									

Health Science Industry Recognized Credentials

Employers were asked to rate 11 credentials in the Health Science industry sector. Certified Nursing Assistant was ranked the highest by employers.

Table 6

Health Science Industry Recognized Credentials

Credential	Required %		Preferred %		Not Considered %		Not familiar with %		Total
Certified nursing assistant	32.50	13	5.00	2	27.50	11	35.00	14	40
Medication aide	12.82	5	12.82	5	33.33	13	41.03	16	39
Pharmacy technician	5.41	2	5.41	2	35.14	13	54.05	20	37
Phlebotomy technician	2.70	1	5.41	2	37.84	14	54.05	20	37
NREMT: Emergency medical technician	2.70	1	13.51	5	35.14	13	48.65	18	37
Feeding assistant	2.70	1	8.11	3	43.24	16	45.95	17	37
National health career associations: Any certificate	2.63	1	15.79	6	26.32	10	55.26	21	38

Credential	Required %		Preferred %		Not Considered %		Not familiar with %		Total
American medical technologists: Phlebotomy	0.00	0	13.51	5	37.84	14	48.65	18	37
Dental assisting national board: National entry level dental assistant	0.00	0	2.78	1	36.11	13	61.11	22	36
Dental assisting national board: Certified dental assistant	0.00	0	5.56	2	36.11	13	58.33	21	36
NREMT: Emergency medical responder	0.00	0	13.89	5	33.33	12	52.78	19	36

Hospitality and Tourism Industry Recognized Credentials

Employers were asked to rate four credentials in the Hospitality and Tourism industry sector. The credential ranked the highest was National Restaurant Association credentials.

Table 7

Hospitality and Tourism Industry Recognized Credentials

Credential	Required %		Preferred %		Not considered %		Not familiar with %		Total
National restaurant association: Level 2 NRA foundations restaurant management and culinary arts	0.00	0	10.53	4	23.68	9	65.79	25	38
national restaurant association: ProStart	0.00	0	10.53	4	21.05	8	68.42	26	38
American hotel & lodging educational institute (AHLEI): Hospitality and tourism management program	0.00	0	5.41	2	24.32	9	70.27	26	37
AHLEI: Skills, tasks, and results training (START)	0.00	0	2.70	1	29.73	11	67.57	25	37

Information Technology

Employers were asked to rate 31 Information Technology credentials in the Information Technology industry sector. Adobe Flash was ranked the highest by employers.

Table 8

Information Technology Industry Recognized Credentials

Credential	Required %		Preferred %		Not considered %		Not familiar with %		Total
Adobe: Flash	2.78	1	13.89	5	25.00	9	58.33	21	36
CompTIA network+	2.78	1	11.11	4	22.22	8	63.89	23	36
CISCO certified network associate	0.00	0	11.11	4	27.78	10	61.11	22	36
CISCO certified entry networking technician	0.00	0	10.81	4	27.03	10	62.16	23	37
CISCO CCT routing and switching	0.00	0	10.81	4	27.03	10	62.16	23	37
CompTIA project+	0.00	0	10.81	4	21.62	8	67.57	25	37
Oracle: Any certified junior associate or higher	0.00	0	10.81	4	21.62	8	67.57	25	37

Credential	Required %		Preferred %		Not considered %		Not familiar with %		Total
Certiport: Databases	2.78	1	8.33	3	19.44	7	69.44	25	36
Certiport: Java	2.78	1	8.33	3	25.00	9	63.89	23	36
CISCO: IT essentials	2.78	1	8.33	3	30.56	11	58.33	21	36
CompTIA security+	2.78	1	8.33	3	25.00	9	63.89	23	36
CompTIA cloud essentials+	2.78	1	8.33	3	22.22	8	66.67	24	36
Certiport: device configuration and management	0.00	0	8.33	3	19.44	7	72.22	26	36
CIW Web foundations associate	0.00	0	8.33	3	27.78	10	63.89	23	36
Adobe: Dreamweaver	2.70	1	8.11	3	27.03	10	62.16	23	37
Certiport: Internet and computing core certification	2.70	1	8.11	3	21.62	8	67.57	25	37
Certiport: Information technology specialist	2.70	1	8.11	3	24.32	9	64.86	24	37

Credential	Required %		Preferred %		Not considered %		Not familiar with %		Total
Certiport: HTML5 application development	2.70	1	8.11	3	18.92	7	70.27	26	37
Certiport: Networking	2.70	1	8.11	3	21.62	8	67.57	25	37
Certiport: Networking security	2.70	1	8.11	3	21.62	8	67.57	25	37
Certiport: Software development	2.70	1	8.11	3	24.32	9	64.86	24	37
CompTIA A+	2.70	1	8.11	3	24.32	9	64.86	24	37
Microsoft technology associate (MTA)	2.70	1	8.11	3	24.32	9	64.86	24	37
Certiport: Python	0.00	0	8.11	3	24.32	9	67.57	25	37
Google IT Support professional	0.00	0	8.11	3	29.73	11	62.16	23	37
Certiport: HTML & CSS	5.41	2	5.41	2	18.92	7	70.27	26	37
Certiport: JavaScript	5.41	2	5.41	2	24.32	9	64.86	24	37

Credential	Required %		Preferred %		Not considered %		Not familiar with %		Total
Apple: Certified support professional	2.70	1	2.70	1	32.43	12	62.16	23	37
Apple: App development with swift	2.70	1	2.70	1	29.73	11	64.86	24	37

In summary, the highest rated credentials for each industry sector were Commercial Driver's License, HVAC Excellence, Adobe: Flash, Certified Nursing Assistant, National Restaurant Association: Level 2 NRA Foundations Restaurant Management and Culinary Arts, Adobe Certified Professional: InDesign, Microsoft Office Specialist (MOS), and Adobe Flash. Overall, the data indicates that many respondents were not familiar with many of the credentials.

Research Question 2

Research question 2 asked, "What degree do employers value credential attainment in the secondary system as a means of preparing students for the workplace?" This question involved the collection of qualitative data from employers in Wisconsin. The survey contained two questions related to value. The questions were what makes an industry-recognized credential valuable and what is preventing wider acceptance of industry-recognized credentials by employers. Thematic analysis was completed to develop themes.

The first question to be analyzed was what is preventing wider acceptance of industry-recognized credentials by employers. After analysis of the data, several major themes emerged. The themes are identified in table 9 in no particular order.

Table 9

Themes of Employer Perspective on Credential Acceptance within the Context of this Study

• The requirement of an industry-recognized credential depends upon the industry sector or occupation. • Not all industry sectors rely on an individual earning a credential. • There is no incentive for a student to earn a credential when it will not increase wages or lead to employment. • There is an overall lack of awareness of credentials by employers and high school students. • There are not enough people to fill the occupations in demand. • It can be difficult to understand the education and training to earn a credential since they are changing rapidly, and it is hard to keep up with the changes.

Quotes from participants included “The difference between what is taught and what is expected in the work environment,” “Funding needed for younger people to obtain these credentials, a lack of awareness about what credentials exist,” and “No pay incentive or recognition of the credential.” Several participants indicated that while industry-recognized credentials are helpful, they are not required. Understanding the content behind the credentials in rapidly evolving areas can also be challenging.

The second question to be analyzed was what makes an industry-recognized credential valuable? After analysis of the data, several major themes emerged. The themes are identified in table 10 in no particular order.

Table 10

Themes of Employer Perspective on Value of Credentials within the Context of this Study

• An industry-recognized credential is considered valuable when it is a requirement and industry standard to obtain employment. • An industry-recognized credential is proof that completers have a foundation of skills that can be applied immediately. • The training and knowledge that leads to the attainment of an industry-recognized credential make it valuable. • Obtaining an industry-recognized credential is proof of competence.

One quote from a participant indicated that an industry-recognized credential is valuable "If VPs and Directors, Business Department Leaders, are aware of them, part of creating them, value them, encourage current employees to earn them, and look for them on potential candidate applications." According to another respondent, a valuable credential means "That it is widely known in the industry, and it is a rigorous process to obtain to demonstrate the credential is worthy for the individual to have."

Research Question 3

Research question 3 asked, "Which credentials are currently being earned by students, and how do those credentials align with employer demand?"

This involved a review of current credentials earned by Wisconsin high school students and a comparison of that to the most in-demand credentials identified by employers. The most recent credential completion data is available on the Wisconsin Department of Public Instruction website. The data is reported by graduating class. According to information released by the Wisconsin Department of Public Instruction, 5,011 CTE Incentive Grant claims were submitted for industry credential attainment. As stated earlier in the research, it is important to note that K-12 school districts are not required to report credential attainment, nor does the Wisconsin Department of Public Instruction collect information on multiple credentials earned by one student. Only one credential per high school graduate is allowable for CTE Incentive Grant claims. The only time multiple credential information is collected for a student is if the student earned Emergency Medical Technician, Emergency Medical Responder, Firefighter 1, Firefighter 2, or Firefighter Inspector.

K-12 school districts report credential completion to access CTE Incentive Grant funding. The top credentials earned by high school graduates are identified in the table below. Refer to Appendix D for a full listing of credentials awarded to 2022 high school graduates.

Assistant Childcare Teacher was the most earned credential in Wisconsin for 2022 high school graduates. Due to no response in the survey from employers in early childhood education, data was not collected on this credential. Microsoft Office Specialist was the second most earned credential in Wisconsin for 2022 high school graduates. This is in alignment with employer feedback. Advanced Manufacturing employers ranked Commercial Driver's License as the most in demand credential. However, only 5 high school students who graduated in 2022 were reported as earning that credential. Employers preferred Autodesk REVIT over Inventor, yet only 17 students earned Autodesk REVIT, versus 175 students earning Autodesk Inventor. In the Architecture and Construction industry sector, Sawblade was ranked last by employers, but was the number one credential earned by students.

The following tables provide a representation of employer ranking of in-demand credentials versus credentials earned by 2022 Wisconsin high school graduates in the industry sectors researched as part of this project.

Of the 25 advanced manufacturing credentials, 18 of the credentials were earned by 2022 high school graduates. Of the top 10 employer identified credentials, seven aligned with the top credentials earned by 2022 high school graduates.

Table 11

Advanced Manufacturing Industry Recognized Credentials

Top credentials by employer demand	Top credentials by supply (2022 HS Grads)
Commercial driver license (CDL)	Autodesk inventor
Certified solidworks professional (CSWP)	Certified solidworks associate (CSWA) – academic
Certified solidworks associate (CSWA) – Academic	MSSC CPT - safety module
Autodesk AutoCAD	Autodesk AutoCAD
MSSC: Certified production technician (CPT) full program	Haas CNC certification
MSSC: CPT - Safety module	Autodesk fusion 360
Level I SENSE/entry welder	MSSC certified production technician (CPT) - full program
MSSC: CPT - quality practices & measurement module	Autodesk REVIT
Autodesk inventor- imperial or metric	Level I SENSE/entry welder
MSSC: CPT - manufacturing processes & production module	MSSC CPT - Quality practices & measurement module
Autodesk maya	Certified solidworks professional (CSWP)
MSSC: CPT maintenance awareness	Commercial driver license (CDL)
Autodesk fusion 360	NIMS any level 1 or level 2 certification
MSSC: CPT green production	C-101 certified industry 4.0 associate - basic operations
National institute for metalworking skills (NIMS): Any level 1 or level 2 certification	MSSC CPT - maintenance awareness
HAAS CNC certification	MSSC CPT - manufacturing processes & production module
Smart automation certification alliance (SACA): C-101 certified industry 4.0 associate basic operations	Master service technician (Briggs and Stratton)
	FANUC certified robot operator 1

Top credentials by employer demand
Autodesk 3dsMax
SACA: C-104 certified industry 4.0 associate IIoT data analytics
SACA: C-103 certified industry 4.0 associate robot systems
SACA: C-102 certified industry 4.0 associate advanced operations
master service technician Briggs and Stratton corporation
Autodesk REVIT- imperial or metric
HVAC excellence -any employment ready certification
FANUC certified robot operator 1

Of the six architecture and construction credentials, no students earned HVAC Excellence which was the top-rated credential by employers. Sawblade, the least rated credential by employers, was the number one credential earned by students.

Table 12

Architecture and Construction Industry Recognized Credentials

Top credentials by employer demand	Top credentials by supply (2022 HS Grad)
HVAC excellence	Sawblade
North American technician excellence certification: HVAC support technician	Career connections - level 3 certificate
International carpenters training fund: Career connections level 3 certificate	NCCER any specialty incl core curriculum
National center for construction education & research	Multi-craft core curriculum (MC3)
North American building trades council: Multi-Craft core curriculum (MC3)	
Woodwork career alliance: Sawblade	

Credentials rated by employers and earned by students in the Arts, A/V, and Communications industry sector had good alignment with each other. The two credentials that employers ranked as third and fourth in-demand were not earned by any 2022 high school graduates.

Table 13

Arts, A/V, Communications Credentials

Top credentials by employer demand	Top credentials by supply (2022 HS Grad)
Adobe certified professional: photoshop	Adobe Illustrator
Adobe certified professional: Premiere pro	Adobe InDesign
Autodesk: Maya	Adobe Photoshop
Autodesk: 3dsMax	Adobe Premier Pro
Adobe certified professional: Illustrator	Adobe certified associate (ACA)
Adobe certified professional: InDesign	

In the business management, finance, and administration industry sector, three of the top four employer rated credentials were in alignment with credentials that students earned.

Table 14

Business Management, Finance and Administration Industry Recognized Credentials

Top credentials by employer demand	Top credentials by supply (2022 HS Grads)
Microsoft Office Specialist (MOS)	ANY A*S*K Business or Marketing Certificate
Intuit-QuickBooks Certified User	
Google Workspace	Microsoft Office Specialist and TWO certifications
A*S*K Business Institute: Concepts of Finance	Microsoft Technology Associate (MTA)
A*S*K Business Institute: any business or marketing certificate	QuickBooks Certified User
Center for Financial Training through American Banking Association-Customer Service Rep	
Center for Financial Training through American Banking Association-Bank Teller	

Students earned credentials in three of the 11 health science credentials available. Certified Nursing Assistant was the top-rated employer credential, and was the top credential earned by 2022 high school graduates.

Table 15

Health Science Industry Recognized Credentials

Top credentials by employer demand	Top credentials by supply (2022 HS Grads)
Certified nursing assistant	CNA (Certified Nurse Aide)
Medication aide	NREMT emergency medical responder
Pharmacy technician certification board: Pharmacy technician	NREMT emergency medical technician
American society for clinical pathology: Phlebotomy technician	
NREMT: Emergency medical technician	
Feeding assistant	
National health career associations: Any certificate	
American medical technologists: Phlebotomy	
National entry level dental assistant	
Certified dental assistant	
NREMT: Emergency medical responder	

Employers rated the National Restaurant Association credentials as the most in demand, which was in alignment with the top credentials earned by 2022 high school graduates.

Table 16

Hospitality and Tourism Industry Recognized Credentials

Top credentials by employer demand	Top credentials by supply (2022 HS Grads)
National restaurant association (NRA): Level 2 NRA foundations restaurant management and culinary arts	NRA prostart
National restaurant association (NRA): ProStart	NRA level foundation restaurant and culinary arts
American hotel & lodging educational institute (AHLEI): Hospitality and tourism management program	
AHLEI: Skills, tasks, and results training (START) curriculum completion	

In the information technology industry sector, there are 31 available credentials to earn. Of these credentials, 2022 high school graduates earned credentials in six of the 31 credentials on the list.

Table 17

Information Technology Industry Recognized Credentials

Top credentials by employer demand	Top credentials by supply (2022 HS Grads)
Adobe: Flash	Adobe Dreamweaver
CompTIA Network+	Cisco Certified Network Associate (CCNA) - Any specialty
CISCO Certified Network Associate	CompTIA A+
CISCO Certified Entry Networking Technician	CompTIA Network+
CISCO CCT Routing and Switching	IT Essentials (CISCO)
CompTIA Project+	Internet Core Computing (IC3)
Oracle: Any certified junior associate or higher	
Certiport: Databases	
Certiport: Java	
CISCO: IT Essentials	
CompTIA Security+	
CompTIA Cloud Essentials+	
Certiport: Device Configuration and Management	
CIW Web Foundations Associate	
Adobe: Dreamweaver	
Certiport: Internet and Computing Core Certification	
Certiport: Information Technology Specialist	
Certiport: HTML5 Application Development	
Certiport: Networking	

Top credentials by employer demand
Certiport: Networking Security
Certiport: Software Development
CompTIA A+
Microsoft Technology Associate (MTA)
Certiport: Python
Google IT Support Professional
Certiport: HTML & CSS
Certiport: JavaScript
Apple: Certified Professional
Linux Professional Institute: Linux Essentials
Apple: Certified Support Professional
Apple: App Development with Swift

Employers identified several occupations with a shortage due to credentialing requirements. These included occupations in nearly all industry sectors. Examples of occupations included medical assistants, CDL drivers, certified nursing assistants, SERV Safe managers, welders, technicians, and farm equipment operators. Employers also provided additional credentials to be considered for offering in the high schools, including Certified Medical Assistant, SERV Safe Food Manager, OSHA, and Off-Highway Diesel Technician.

Summary

This chapter detailed the findings of qualitative and quantitative data collected through a survey of employers in Wisconsin. Quantitative data identified the most in-demand and valuable

industry-recognized credentials by Wisconsin employers. Descriptive analysis was used to evaluate the quantitative data. Qualitative data included the collection of employer perceptions of the acceptance and value of industry-recognized credentials in the secondary system. Results from the qualitative data were analyzed through thematic analysis to identify themes.

Chapter V: Discussion, Conclusion, and Recommendations

The purpose of this study was to determine the most in demand and valued IRCs by employers. The study aimed to address the significance and of IRC attainment in Wisconsin high schools. The study was designed to answer the following questions: (1) What are the most in-demand industry-recognized credentials sought by employers? (2) To what degree do employers value credential attainment in the secondary system as a means of preparing students for the workplace? (3) Which credentials are currently being earned by students, and how do those credentials align with employer demand? This chapter will summarize the research findings, form conclusions, and make recommendations for future research, offerings, and funding of industry-recognized credentials in Wisconsin.

Discussion

This section contains a discussion of each research question.

Research Question 1

Research question 1 states, “What are the most in-demand industry-recognized credentials sought by employers?” Employers ranked industry-recognized credentials by industry sector. The choices were required, preferred, not considered, and not familiar with. The highest ranked credentials were Commercial Driver’s License, HVAC Excellence, Adobe Certified Professional-In Design, Microsoft Office Specialist, Certified Nursing Assistant, Adobe Flash, and National Restaurant Association: Level 2 NRA Foundations Restaurant Management and Culinary Arts. Several of the credentials that ranked the highest are required for employment in the occupation.

Research Question 2

Research question 2 states, “To what degree do employers value credential attainment in the secondary system as a means of preparing students for the workplace?” The survey contained two questions related to value. The questions were what is preventing wider acceptance of industry recognized credentials by employers and what makes an industry recognized credential valuable. Employer responses led to several themes regarding wider acceptance of industry recognized credentials. These included the requirement of an industry recognized credential being dependent upon the industry sector or occupation, not all industry sectors are reliant on an individual earning a credential, no incentive for a student to earn a credential when it will not increase wages or lead to employment, overall lack of awareness of credentials by employers and high school students, not enough people to fill the occupations in demand, and difficulty understanding the education and training to earn a credential since they are changing at a rapid pace.

One employer stated “a lack of awareness about what credentials exist” is preventing wider acceptance of credentials by employers. The research indicated that many employers were not familiar with several of the credentials currently being offered in the secondary system. Due to the lack of employer engagement on developing the CTE Incentive Grant listing, it would make sense that employers are not familiar with all the credentials being offered in the secondary system. Another employer stated “understanding of how the credential brings value and knowledge to the organization” supports other comments indicating a disconnect between human resources and hiring managers within companies. Employers also cited the need to fill positions quickly that in the past required a credential, but now are not as relevant.

The second question employers answered was what makes an industry recognized credential valuable. Again, several themes emerged including an industry recognized credential is considered valuable when it is a requirement and industry standard to obtain employment, proof that completers have a foundation of skills that can be applied immediately, training and knowledge that leads to the attainment of an industry recognized credential, and proof of competence.

One quote from a participant indicated that an industry recognized credential is valuable "if VPs and Directors, Business Department Leaders, are aware of them, part of creating them, value them, encourage current employees to earn them, and look for them on potential candidate applications." Employers need to be actively involved in all steps related to credential offerings. This includes employers ensuring that credentials of value are included in job postings. According to another respondent, a valuable credential means "that it is widely known in the industry, and it is a rigorous process to obtain to demonstrate the credential is worthy for the individual to have."

Research Question 3

Research question 3 states, "Which credentials are currently being earned by students, and how do those credentials align with employer demand?" To answer this question, the researcher utilized publicly available data on the Wisconsin Department of Public Instruction web site. The most recent data was for 2022 high school graduates in Wisconsin. It is important to note that the Wisconsin Department of Public Instruction and Wisconsin Department of Workforce Development do not collect all credential information. The only credential information collected is for the CTE Incentive Grant program. Assistant Childcare Teacher was the most earned credential in Wisconsin for 2022 graduates. Certified Nursing Assistants and

Microsoft Office Specialists were ranked second and third, which aligned with employer rankings of required or preferred credentials. Employers ranked Commercial Driver's License (CDL) number one, yet only two students were reported as earning the credential. The limited number of high school students earning a CDL is likely linked to industry requirements that students must be 18 years of age and the cost to obtain the credential. Most training programs in Wisconsin cost anywhere between $2500 and $8000.

When comparing employer demand of credentials against secondary student credential supply, students are earning credentials in several of the highest ranked employer credentials. However, there are many credentials on the state listing that no one students are earning.

Conclusions

This section contains conclusions from the research. The result of the data collected allowed the researcher to gather feedback from employers on industry-recognized credentials. The results of the research are consistent with the literature review findings. Existing research gathering the employer's voice was limited. Rachel Vilsack with the National Skills Coalition identified four key criteria for defining quality non-degree credentials. These include evidence of job opportunities associated with the credential, evidence of competencies mastered by credential holders, transparent evidence of earning and employment outcomes of individuals who earn a credential, and stack ability to additional education and training (Vilsack, 2021). Vilsack's recommendations align with the overarching themes of qualitative analysis.

Several ethical concerns arose during the research regarding industry recognized credentials offered in the secondary system. One could assume that school districts only offer credentials they will be reimbursed for, and not the credentials that are most sought out in the workplace. This was highlighted in the research when employers identified lower cost

credentials that are in-demand, yet not available for reimbursement. Employers are not allowed to submit credentials for consideration to the Wisconsin Department of Workforce Development, only school district superintendents. From a workforce development perspective, is it the job of the secondary school to ensure students are job-ready? One could argue that the secondary system's role should be to ensure that students are college and career ready, emphasizing the importance of academic preparation.

The highest ranked credentials were those required for employment. Giani (2022), as quoted in the literature review, concludes that the attainment of credentials is a "net positive but not a game changer" (p. 5). For industry-recognized credential attainment to be a game changer, employers must play a key role in valuing credentials. Giani (2022) stressed, "states, educators, and employers need to help students prioritize the credentials that will carry the most value in the workforce given the time and resource constraints inherent in schools." (p.7). The research found that many credentials currently approved for CTE Incentive Grant funding are not familiar to employers, and not considered for employment. According to findings from the second phase of the Credentials Matter project in 2020, while many states indicated they are working to improve the link between their CTE programs and their labor markets, half of all states aren't collecting the necessary data to know how aligned their credential programs are with employer demand, and not a single state's secondary credential program measures as "highly aligned" with the job market (Credentials Matter, 2020).

Education Strategy Group cited that accurate and reliable data on credential completion, employer demand, and value of credential attainment will ensure that the right credentials are incentivized and prioritized. Finding real data about individuals possessing industry credentials and credentials, in general, has been equated to a "black hole" (Foster, 2013). Wisconsin has

limited data on industry-recognized credential completion by high school students. Credentials Matter, an organization conducting national research on credential attainment in the secondary system, indicated that data would allow states to analyze the statewide landscape of credential offerings and attainment – in other words, the state's talent pipeline – and develop strategies to increase alignment, improve quality, ensure equity, and maximize return on investment across systems (Credentials Matter, 2020).

Recommendations

After conducting the study and analyzing the data, the following recommendations are offered:

- Regarding listing grant-eligible industry-recognized credentials in the secondary system, it would appear on the surface that in some industry sectors, there are too many options. For example, 25 credentials are eligible for funding in the advanced manufacturing industry sector. Many of these are not offered in school districts. The Wisconsin Department of Workforce Development should work with employers to create a listing of industry-recognized credentials that are most in demand and valued. At present, school district superintendents are the only individuals allowed to submit new credential requests. It is unknown if school district superintendents communicate with employers to develop a list of credentials to be offered.
- Due to some credentials not being on the approved CTE Incentive Grant Funding list, school districts may choose not to offer them, even though employers indicated they are in demand. Several credentials are cost-prohibitive to school districts. With a tiered approach, more in-demand and valued credentials would be offered in Wisconsin school districts. A tiered approach to funding for credentials would allow

for lesser-cost credentials to be offered. For example, OSHA and SERV Safe are relatively inexpensive credentials. Tiered funding would also allow for additional funding to be allocated to higher cost credentials that employers indicate are in demand.

- The research revealed that employers do not understand what credentials are offered in school districts. The Wisconsin Department of Workforce Development should develop a statewide marketing plan of the CTE Incentive Grant program and communication of credentials being offered to help employers better understand the program and provide them a voice to identify in demand and valued credentials.
- Wisconsin is lacking a data system to collect credential attainment information. At the present time, school districts only provide credential attainment for grant funding. Consistent with the literature, the necessary data is not being collected to better understand alignment of credential attainment and industry demand.
- There are few, if any, incentives for secondary educators to obtain the proper training to offer courses that lead to credential attainment. A program like that of Florida's CAPE Act where educators are provided the training to offer credentials and earn a bonus when students complete credentials should be explored.
- High schools should partner with technical colleges, training centers, and business and industry partners to offer in-demand and valued industry recognized credentials.
- The Wisconsin Department of Workforce Development should partner with employers to develop an industry recognized credential list spanning the education and workforce systems that are backed by labor market data and have demonstrated postsecondary value.

The value that employers place upon the attainment of industry recognized credentials earned by high school students has been under researched. Areas for further research include deeper analysis of occupations that require credentials, expanded research of employer opinions and recommendations for industry recognized credentials in the secondary system, and research specific to the value that K-12 school district administration and educators place upon offering credentials and credential attainment.

References

Advance CTE. (2023, February). *State policies impacting CTE: 2022 year in review*. https://careertech.org/wp-content/uploads/2023/09/CTEWorks-February-2023.pdf

Career clusters. (n.d.). Advance CTE. https://careertech.org/career-clusters

Castellano, M., III, J.R.S. & Stringfield, S. (2005). Earning Industry-Recognized Credentials in High School: Exploring Research and Policy Issues. *Journal of Career and Technical Education*, *21*(2). DOI: http://doi.org/10.21061/jcte.v21i2.653

Credentials Matter. (2019). *Report 1: A national landscape of high school student credential attainment compared to workforce demand*. ExcelinEd/burningglass Technologies. https://www.excelined.org/wp-content/uploads/2019/05/ExcelinEdBurningGlassTechnologies.CredentialsMatterNationalLandscapeofHighSchoolCredentialAttainmentComparedtoWorkforceDemand.May2019.pdf

Credentials Matter. (2020). *Phase 2: A 2020 update on credential attainment and workforce demand in america*. ExcelinEd/burningglass Technologies. https://excelined.org/wp-content/uploads/2020/11/ExcelinEdBurningGlassTechnologies.CredentialsMatter.Phase2_.Report.September2020.pdf

Creswell, J. W. (1998). *Qualitative inquiry and research design: choosing among five traditions*. SAGE Publications.

Creswell, J. W., & Clark, V. L. (2017). *Designing and conducting mixed methods research*. SAGE Publications.

Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry & research design: choosing among five approaches* (Fourth edition.). SAGE.

Cushing, E., English, D., Therriault, S., and Lavinson, R. (2019). *Developing a **c**ollege- and **c**areer-ready **w**orkforce: An analysis of ESSA, Perkins V, IDEA, and WIOA*. American Institutes for Research. https://www.air.org/sites/default/files/Developing-a-Career-Ready-Workforce-Brief-March-2019.pdf

D'Agostino, S. (2023, March 3). *Microcredentials confuse employers, colleges, and learners*. Inside Higher Ed. https://www.insidehighered.com/news/2023/03/03/microcredentials-confuse-employers-colleges-and-learners

Eagan, J., & Koedel, C. (2021, September). *Career readiness in public high schools: An exploratory analysis of industry recognized credentials* [Working Paper No. 257-0921]. National Center for Analysis of Longitudinal Data in Education Research. https://files.eric.ed.gov/fulltext/ED616072.pdf

Education Strategy Group. (2018). *Credential currency: How states can identify and promote credentials of value.* https://edstrategy.org/wp-content/uploads/2018/10/ESG-Credential-Currency-Full-Report.pdf

Education Strategy Group. (2019). *Building credential currency: Resources to drive attainment across K-12, higher education, and workforce development.* https://edstrategy.org/wp-content/uploads/2019/06/Building-Credential-Currency_FINAL-1.pdf

Education Strategy Group. (n.d.). *Who we are*. Retrieved July 31, 2020, from https://edstrategy.org/who-we-are/

Estes, A. (2020, June 4). Navigating CTE during COVID-19: What are credential providers doing to respond to COVID-19? *Advance CTE*. http://blog.careertech.org/?p=16682

Fong, J., Etter, B., & Sullberg, D. (2023, February). *The effect of employer understanding and engagement on non-degree credentials*. Collegis Education. https://collegiseducation.com/wp-content/uploads/2023/02/UPCEA-Collegis-Employers-and-Microcredentials-Report.pdf

Foster, J. (2013, December). Industry credentials. *An educational revolution. American Technical Education Association Journal, 41* (2). https://ateaonline.org/resources/ATEA-Journal%20Fall%202013.pdf

George, T. (2021, August 13). *Mixed methods research: Definition, guide & examples*. Scribbr. https://www.scribbr.com/methodology/mixed-methods-research/

Giani, M. (2022). *How attaining industry-recognized credentials in high school shapes education and employment outcomes*. The Thomas B. Fordham Institute Advancing Educational Excellence. https://fordhaminstitute.org/sites/default/files/publication/pdfs/final-industry-recognized-credentials-08232022irc.pdf

Gill, M. J. (2014). The possibilities of phenomenology for organizational research. *Organizational Research Methods*, *17*(2), 118–137. https://doi.org/10.1177/1094428113518348

Gyll, S. P. (2021). Career development by design, not default: Creating a more efficient and data-driven process by connecting aptitude-based learner guidance to post-secondary pathways, competency-based credentials, and high-demand jobs. *The Journal of Competency-Based Education*, *6*(1). https://doi.org/10.1002/cbe2.1236

Hendricks, A., Myran, S., Katsioloudis, P. J., Owings, W., & Kaplan, L. (2021). Career and technical education industry credentials and its potential impact on a state's economy. *The*

Journal of Applied Business and Economics, *23*(8), 1-10. https://doi.org/10.33423/jabe.v23i8.4870

Laprade, N., Bird, K., Good, L., La Prad, J., MacFarlane, T., & Farley, C. (2015). *Making a market for competency-based credentials*. Corporation for a Skilled Workforce. https://skilledwork.org/wp-content/uploads/2013/12/MakingaMarketforCompetency-BasedCredentials.pdf

Lichtman, M. (2012). *Qualitative research in education: A user's guide* (3rd Edition). Sage Publication.

Malin, J. R., Bragg, D. D., & Hackmann, D. G. (2017). College and Career Readiness and the Every Student Succeeds Act. Educational Administration Quarterly, 53(5), 809-838. https://doi.org/10.1177/0013161X17714845

Malkus, N. (2019). *The evolution of career and technical education: 1982-2013*. American Enterprise Institute. https://www.aei.org/wp-content/uploads/2019/04/The-Evolution-of-Career-and-Technical-Education.pdf

Mantick, K. (2019, February 18). 7 Perkins V changes every school should know about. *Solid Professor*. https://www.solidprofessor.com/blog/7-perkins-v-changes-every-school-should-know-about/

Patten, M. L., & Newhart, M. (2017). *Understanding research methods: An overview of the essentials*. (10th ed.). Routledge. https://doi.org/10.4324/9781315213033

Perkins Collaborative Resource Network. (n.d.). Perkins V. Retrieved (July 21, 2023), from https://cte.ed.gov/legislation/perkins-v. Perkins V. (2018, July).

Rojewski, J.W. (2002). Preparing the Workforce of Tomorrow: A Conceptual Framework for Career and Technical Education. The Journal of Vocational Education Research, 27, 7-34. https://doi.org/10.5328/JVER27.1.7

Society for Human Resource Management. (2021). *Making alternative credentials work: A new strategy for HR professionals*. https://www.shrm.org/foundation/about/Documents/Making%20Alternative%20Credentials%20Work%20A%20New%20Strategy%20for%20HR%20Professionals.pdf

STEMconnector. (2015). *Advancing a jobs-driven economy: Higher education and business partnerships lead the way advancing a jobs-driven economy**:** higher education and business partnerships lead the way*. Morgan James Publishing.

Sussman, S. (2019, January). Identifying and encouraging students to earn industry-recognized credentials. *Thomas B. Fordham Institute: Advancing Educational Excellence*. https://fordhaminstitute.org/national/commentary/identifying-and-encouraging-students-earn-industry-recognized-credentials

The Lumina Foundation. (2015, June). *Connecting **c**redentials: Making the case for reforming the U.S. Credentialing system.* https://connectingcredentials.org/wp-content/uploads/2015/06/MakingTheCase-6-8-15.pdf

United States Department of Education. (2023, January). *Raise the bar: Lead the world executive summary*. https://www2.ed.gov/about/inits/ed/raise-the-bar/executive-summary.pdf

United States Bureau of Labor Statistics, (n.d.). *Occupational requirements survey*. https://www.bls.gov/ors/factsheet/credentials.htm

Vilsack, R. (2021, August). *Creating an impact with credential quality and transparency*. National Skills Coalition. https://nationalskillscoalition.org/wp-content/uploads/2021/08/NSC-credential-quality_toolkit_final.pdf

Wilcox, D. (n.d.). The National Skill Standards Board: Building the Foundation for a Dynamic Workforce. *National Skill Standard Board*. https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.506.6423&rep=rep1&type=pdf

Wisconsin Department of Public Instruction. (2020). *CTE technical incentive grants*. https://dpi.wi.gov/cte/technical-incentive

Wisconsin Department of Public Instruction. (2023). *Career pathway type*. https://dpi.wi.gov/wise/data-elements/career-pathway-type

Appendix A

IRB Approval Letter

INSTITUTIONAL REVIEW BOARD

Office of Research and Sponsored Programs

Robert S. Swanson Learning Center #201

715-232-4042

irb@uwstout.edu

Date: June 2, 2023

PI: Jennifer Wagner

Department: TEACHING LEARNING & LEADERSHIP, GRADUATE STUDENT

Re: Initial - IRB-FY2023-215

Perception of Business and Industry Credential Attainment in the Secondary Education System

Dear Jennifer Wagner,

In accordance with Federal regulations, your project, Perception of Business and Industry Credential Attainment in the Secondary Education System, was reviewed by a member of the University of Wisconsin - Stout Institutional Review Board and was determined to be Exempt from full review under the below Categories in accordance with Federal Policy for the Protection of Human Subjects (45 CFR 46).
Category: Category 2. (i). Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met:
The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects; You project is hereby approved and deemed exempt from further IRB review for 5

years from June 2, 2023. If a renewal of this approval is needed, it is to be submitted at least 10 working days prior to the expiration date.

Responsibilities for Principal Investigators of UW-Stout IRB-approved research:

1. No subjects may be involved in any study procedure prior to the IRB approval date or after the expiration date.
2. All unanticipated or serious adverse events must be reported to the IRB.
3. All protocol modifications must be approved prior to implementation unless they are intended to reduce risk.
4. All protocol deviations must be reported to the IRB.
5. All recruitment materials and methods must be approved by the IRB prior to being used.
6. Research which involves financial compensation to participants must follow appropriate UW-Stout payment procedures.
7. Consent forms must adhere to UW-Stout IRB standards and indicate that the research has been approved by the UW-Stout IRB as required by federal regulations (see UW-Stout IRB consent form templates for more details).
8. Researchers conducting human subjects' research under an approved exempt category are still ethically bound to follow the basic ethical principles of the Belmont Report, as reflected in the practice of obtaining informed consent from participants and adherence to IRB approved methods.
9. Any modifications to the approved study must be submitted for review through Cayuse IRB. All approval letters and study documents are located within the Study Details in Cayuse IRB.

Thank you for your cooperation with the IRB and best wishes with your project. If you have questions, please contact the IRB office at irb@uwstout.edu or by phone 715-232-4042, and your question will be directed to the appropriate person.

Sincerely,

Michael Mensink, Ph.D.; IRB Chair

University of Wisconsin-Stout Institutional Review Board

Appendix B

Survey on Industry-Recognized Credentials Demand and Value

Start of Block: Vote and Rank

Instruction You are being asked to complete the following survey to help inform a better understanding of in demand and valued industry recognized credentials. The purpose of this study is to determine the most in demand and valued IRCs by employers and identify ways to ensure students have access to earn those credentials. The study will aim to address the significance and return on investment of IRC attainment in high school. The goal is to give insight on better funding alignment to the most in demand IRCs. In the process, school districts will be able to better students for employment. Employers will see an increase in the number of skilled high school graduates.

The study will seek to answer the following research questions: What are the most in-demand Industry Recognized Credentials sought by employers? To what degree do employers value credential attainment in the secondary system as a means of preparing students for the workplace? Which credentials are currently being earned by students, and how do those credentials align with employer demand?

Your response will be kept confidential, and any aggregation of findings will preserve anonymity. The survey should take approximately 10 minutes to complete.

Informed Consent
You are invited to participate in the research study described below. Your participation is entirely voluntary, and you may stop your participation or withdraw from the study at any time and for any reason. If you choose to not participate or to stop your participation, there will be no negative consequences to you. Your decision to participate or not in this study will not change your relationship with the researchers or the University of Wisconsin-Stout.

The researcher does not believe this study will cause you any discomfort or other risk beyond what you would normally experience in your daily life.

The researcher will have access to the survey data. The survey data will be housed on a password protected computer.

The purpose of this study is to determine the most in demand and valued IRCs by employers and identify ways to ensure students have access to earn those credentials. The study will aim to address the significance and return on investment of IRC attainment in high school. The goal is to give insight on better funding alignment to the most in demand IRCs. In the process, school districts will be able to better students for employment. Employers will see an increase in the number of skilled high school graduates.

I agree to participate in this study and understand that I may stop my participation or withdraw my consent at any time during active participation.

O Yes (1)

O No (2)

Q1 Are you familiar with the Career and Technical Education Incentive Grant Program in Wisconsin?

O Yes (1)

O No (2)

Q2 What industry sector does your company align best with?

- O Agriculture, Food, Natural Resources (1)
- O Architecture and Construction (2)
- O Business Management, Administration, Finance (3)
- O Healthcare (4)
- O Hospitality and Tourism (5)
- O Advanced Manufacturing (6)
- O Arts, A/V Technology, and Communications (7)
- O Information Technology (8)
- O Early Childhood Education (9)

Q3 My company employs:

- O More than 50 employees (1)
- O Fewer than 50 employees (2)

Q4 My company provides pay increases for credentials earned.

- O No (1)
- O Yes (2)

Q5 Based on your experience and knowledge, how important is each credential in deciding to hire or promote an individual?

- O Not at all important (1)
- O Slightly important (2)
- O Moderately important (3)
- O Very important (4)
- O Extremely important (5)

Q6 Are there any occupations in your industry that are particularly difficult to fill because prospective employees lack the necessary non-degree credentials?

- O Yes (1)
- O Maybe (2)
- O No (3)

Q7 If you answered "Yes" to the question above, please explain which occupations you have noticed a shortage due to credentialing.

_____

Q8, Do you participate in a business and education partnership with your local school district?

- O Yes (1)
- O No (2)

Q9 Have you been asked to provide input and feedback related to programming at your local school district?

- O Yes (1)
- O No (2)
- O Unsure (3)

Q10 What is preventing wider acceptance of industry recognized credentials in the hiring process?

_____

Q11 What makes an industry recognized credential valuable?

The following questions will have you rate Industry Recognized Credentials by required, preferred, not considered, or not familiar with. Please only rate the area in which you would employ people.

Q12 Please rate the following Advanced Manufacturing Industry Recognized Credentials by how valued they are in relation to employment.

	Required (1)	Preferred (2)	Not Considered (3)	Not familiar with (4)
Level I SENSE/Entry Welder (1)	O	O	O	O
Autodesk AutoCAD (2)	O	O	O	O
Autodesk Inventor-Imperial or Metric (3)	O	O	O	O
Autodesk REVIT-Imperial or Metric (4)	O	O	O	O
Autodesk Maya (5)	O	O	O	O
Autodesk 3dsMax (6)	O	O	O	O
Autodesk Fusion 360 (7)	O	O	O	O
Master Service Technician Briggs and Stratton Corporation (8)	O	O	O	O
Commercial Driver License (CDL) (9)	O	O	O	O
FANUC Certified Robot Operator 1 (10)	O	O	O	O
HAAS CNC Certification (11)	O	O	O	O
HVAC Excellence -Any Employment Ready Certification (12)	O	O	O	O
MSSC: Certified Production Technician (CPT) full program (13)	O	O	O	O
MSSC: CPT - Safety Module (14)	O	O	O	O
MSSC: CPT - Quality Practices & Measurement Module (15)	O	O	O	O
MSSC: CPT - Manufacturing Processes & Production Module (16)	O	O	O	O

MSSC: CPT – Maintenance Awareness (17)	0	0	0	0
MSSC: CPT– Green Production (18)	0	0	0	0
National Institute for Metalworking Skills (NIMS): Any Level 1 or Level 2 Certification (19)	0	0	0	0
Smart Automation Certification Alliance (SACA): C-101 Certified Industry 4.0 Associate – Basic Operations (20)	0	0	0	0
Smart Automation Certification Alliance (SACA): C-102 Certified Industry 4.0 Associate – Advanced Operations (21)	0	0	0	0
Smart Automation Certification Alliance (SACA): C-103 Certified Industry 4.0 Associate – Robot Systems (22)	0	0	0	0
Smart Automation Certification Alliance (SACA): C-104 Certified Industry 4.0 Associate – IIoT and Data Analytics (23)	0	0	0	0
SolidWorks: Certified SolidWorks Associate (CSWA) - Academic (24)	0	0	0	0
SolidWorks: Certified SolidWorks Professional (CSWP) (25)	0	0	0	0

Q13 Please rate the following Architecture and Construction Industry Recognized Credentials by how valued they are in relation to employment.

	Required (1)	Preferred (2)	Not Considered (3)	Not familiar with (4)
HVAC Excellence (1)	O	O	O	O
National Center for Construction Education & Research (2)	O	O	O	O
North American Building Trades Council: Multi-Craft Core Curriculum (MC3) (3)	O	O	O	O
North American Technician Excellence Certification: HVAC Support Technician (4)	O	O	O	O
International Carpenters Training Fund: Career Connections Level 3 Certificate (5)	O	O	O	O
Woodwork Career Alliance: Sawblade (6)	O	O	O	O

Q14 Please rate the following Arts, A/V Technology, and Communications Industry Recognized Credentials by how valued they are in relation to employment.

	Required (1)	Preferred (2)	Not Considered (3)	Not familiar with (4)
Autodesk: Maya (1)	O	O	O	O
Autodesk: 3dsMax (2)	O	O	O	O
Adobe Certified Professional: Illustrator (3)	O	O	O	O
Adobe Certified Professional: InDesign (4)	O	O	O	O
Adobe Certified Professional: Photoshop (5)	O	O	O	O
Adobe Certified Professional: Premiere Pro (6)	O	O	O	O

Q15 Please rate the following Business Management, Finance, and Administration Industry Recognized Credentials by how valued they are in relation to employment.

	Required (1)	Preferred (2)	Not Considered (3)	Not familiar with (4)
A*S*K Business Institute: any business or marketing certificate (1)	O	O	O	O
Google Workspace (2)	O	O	O	O
Microsoft Office Specialist (MOS) (3)	O	O	O	O
A*S*K Business Institute: Concepts of Finance (4)	O	O	O	O
Center for Financial Training through American Banking Association-Bank Teller (5)	O	O	O	O
Center for Financial Training through American Banking Association-Customer Service Representative (6)	O	O	O	O
Intuit-QuickBooks Certified User (7)	O	O	O	O

Q16 Please rate the following Health Science Industry Recognized Credentials by how valued they are in relation to employment.

	Required (1)	Preferred (2)	Not Considered (3)	Not familiar with (4)
American Medical Technologists: Phlebotomy (1)	O	O	O	O
American Society for Clinical Pathology: Phlebotomy Technician (2)	O	O	O	O
Dental Assisting National Board: National Entry Level Dental Assistant (3)	O	O	O	O
Dental Assisting National Board: Certified Dental Assistant (4)	O	O	O	O
National Health career Associations: Any Certificate (5)	O	O	O	O
National Registry of Emergency Medical Technicians (NREMT): Emergency Medical Responder (6)	O	O	O	O
NREMT: Emergency Medical Technician (7)	O	O	O	O
Pharmacy Technician Certification Board: Pharmacy Technician (8)	O	O	O	O
Certified Nursing Assistant (9)	O	O	O	O
Feeding Assistant (10)	O	O	O	O
Medication Aide (11)	O	O	O	O

Q17 Please rate the following Hospitality and Tourism Industry Recognized Credentials by how valued they are in relation to employment.

	Required (1)	Preferred (2)	Not Considered (3)	Not familiar with (4)
American Hotel & Lodging Educational Institute (AHLEI): Hospitality and Tourism Management Program (1)	O	O	O	O
AHLEI: Skills, Tasks, and Results Training (START) Curriculum Completion (2)	O	O	O	O
National Restaurant Association: Level 2 NRA Foundations Restaurant Management and Culinary Arts (3)	O	O	O	O
National Restaurant Association: ProStart (4)	O	O	O	O

Q18 Please rate the following Information Technology Industry Recognized Credentials by how valued they are in relation to employment.

	Required (1)	Preferred (2)	Not Considered (3)	Not familiar with (4)
Adobe: Dreamweaver (1)	O	O	O	O
Adobe: Flash (2)	O	O	O	O
Apple: Certified Support Professional (3)	O	O	O	O
Apple: Certified Professional (4)	O	O	O	O
Apple: App Development with Swift (5)	O	O	O	O
Certiport: Internet and Computing Core Certification (6)	O	O	O	O
Certiport: Information Technology Specialist (7)	O	O	O	O
Certiport: Databases (8)	O	O	O	O
Certiport: Device Configuration and Management (9)	O	O	O	O
Certiport: HTML & CSS (10)	O	O	O	O
Certiport: HTML5 Application Development (11)	O	O	O	O
Certiport: Java (12)	O	O	O	O
Certiport: JavaScript (13)	O	O	O	O
Certiport: Networking (14)	O	O	O	O
Certiport: Networking Security (15)	O	O	O	O
Certiport: Python (16)	O	O	O	O
Certiport: Software Development (17)	O	O	O	O

CISCO: IT Essentials (18)	O	O	O	O
CISCO Certified Entry Networking Technician (19)	O	O	O	O
CISCO Certified Network Associate (20)	O	O	O	O
CISCO CCT Routing and Switching (21)	O	O	O	O
CIW Web Foundations Associate (22)	O	O	O	O
CompTIA A+ (23)	O	O	O	O
CompTIA Security+ (24)	O	O	O	O
CompTIA Network+ (25)	O	O	O	O
CompTIA Cloud Essentials+ (26)	O	O	O	O
CompTIA Project+ (27)	O	O	O	O
Google IT Support Professional (28)	O	O	O	O
Linux Professional Institute: Linux Essentials (29)	O	O	O	O
Microsoft Technology Associate (MTA) (30)	O	O	O	O
Oracle: Any certified junior associate or higher (31)	O	O	O	O

Q19 Please rate the following Early Childhood Education Industry Recognized Credential by how valuable it is in relation to employment.

	Required (1)	Preferred (2)	Not considered (3)	Not familiar with (4)
Assistant Childcare Teacher (1)	O	O	O	O

Q20 Are their additional industry recognized credentials in your industry that are not on the list above that you believe are in-demand leading to high-skill and high-wage occupations?

O Yes (1)

O No (2)

Q21 If you answered "Yes" to the question above, please list the industry recognized credential(s) here (no abbreviations). Please do not include proprietary credentials specific to your organization.

Appendix C

Survey Email

Good afternoon,

My name is Jennifer Wagner, and I am currently a doctoral candidate at the University of Wisconsin Stout. I have been in the field of career and technical education my entire career. I have completed all my educational requirements at the college, with my dissertation research being the last step!

The purpose of the study is to determine the most in-demand and valued Industry Recognized Credentials by employers and identify ways to ensure students have access to earn those credentials. The study will address the significance of credential attainment in high school.

The study aims to address the following research questions:

1. What are the most in-demand Industry Recognized Credentials sought by employers?
2. To what degree do employers value credential attainment in the secondary system as a means of preparing students for the workplace?
3. Which credentials are currently being earned by students, and how do those credentials align with employer demand?

Your participation in the research is entirely voluntary, and you may stop your participation or withdraw from the study at any time and for any reason. If you choose to not participate or to stop your participation, there will be no negative consequences to you. Your decision to participate or not in this study will not change your relationship with the researchers or the University of Wisconsin-Stout. The survey will not identify you or the company you work for. The survey data will be housed on a password protected computer. This research has received Institutional Review Board Approval from UW Stout.

Visit this link to complete the survey:
https://uwstout.qualtrics.com/jfe/form/SV_0jGWPvNwDTzBqsK
OR Scan the QR Code below to complete the survey:

My request is for only employers to complete the survey. Please forward this survey to any employers that you work with. The survey will close at 11:59 p.m. on Monday June 19th, 2023.

If you have any questions, do not hesitate to contact me. My email address is wagnerjj@charter.net. The final survey results, recommendations, and dissertation will be shared with those who request it.

I look forward to your participation!

Jennifer Wagner
University of Wisconsin-Stout
Doctor of Education, Career and Technical Education Leadership

Appendix D

Wisconsin 2022 High School Graduate Industry Recognized Credential Attainment

Wisconsin Class of 2022 Career and Technical Education Incentive Grants Paid Claims by Certification* * This report is for program purposes only. Appropriate use of this report is limited to identifying the categories and specific certifications for district incentive grant claims submitted by school districts for the Class of 2022 graduates and that were paid. The numbers reported herein should not be interpreted as the number of certifications earned by Wisconsin students in public school districts.	
Specific Certification	**Count of Paid Claims**
Category: Business and Industry	**5100**
Adobe Certified Associate (ACA)	3
Adobe Dreamweaver	13
Adobe Illustrator	55
Adobe InDesign	5
Adobe Photoshop	159
Adobe Premier Pro	6
ANY A*S*K Business or Marketing Certificate	193
ASE Certification - ANY area	86
ASE Entry-Level Certification	132
ASE Student Career Development	3
Assistant Child Care Teacher	969
Autodesk AutoCAD	30
Autodesk Fusion 360	26
Autodesk Inventor	175
Autodesk REVIT	17
C-101 Certified Industry 4.0 Associate - Basic Operations	3
Career Connections - Level 3 Certificate	429
Certified SolidWorks Associate (CSWA) - Academic	100
Certified SolidWorks Professional (CSWP)	10
Cisco Certified Network Associate (CCNA) - Any specialty	22
CNA (Certified Nurse Aide)	833
Commercial Driver License (CDL)	5
CompTIA A+	2
CompTIA Network+	1
FANUC Certified Robot Operator 1	1
Fire Fighter 1	28
Fire Fighter 2	1
Fire Inspector	1

Haas CNC Certification	28
Infant Toddler	94
Internet Core Computing (IC3)	1
IT Essentials (CISCO)	92
Level I SENSE/Entry Welder	16
MSSC Certified Production Technician (CPT) - full program	18
MSSC CPT - Maintenance Awareness	2
MSSC CPT - Manufacturing Processes & Production Module	2
MSSC CPT - Quality Practices & Measurement Module	16
MSSC CPT - Safety Module	54
Master Service Technician (Briggs and Stratton)	1
Microsoft Office Specialist and TWO certifications	939
Microsoft Technology Associate (MTA)	31
Multi-Craft Core Curriculum (MC3)	4
NCCER Any specialty incl Core Curriculum	25
NIMS Any Level 1 or Level 2 Certification	5
NRA ProStart	8
NRA Level Foundation Restaurant and Culinary Arts	12
NREMT Emergency Medical Responder	4
NREMT Emergency Medical Technician	53
QuickBooks Certified User	2
Snap-On Or any TWO other certifications	107
Snap-On Precision Measurement Instruments	129
Sawblade	149