PROGRAM REVIEW: A PRACTICAL GUIDE FOR TECHNICAL AND COMMUNITY COLLEGES TO ALIGN PROGRAMS TO WORKFORCE NEEDS

by

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ABSTRACT

Higher education is experiencing tremendous pressure for improved rates of degree completion to help the United States remain competitive in the global economy. Completion has become a high priority for community colleges driven by a reform movement led by federal and state policymakers, accreditors, foundations, businesses, and educators, intended to dramatically increase the number of graduates from the nation's colleges and universities. At current rates of educational attainment, and as baby boomers retire, the pipeline of college graduates will not be enough to meet future workforce skills demands. To help achieve current and future U.S. labor market needs, community colleges are focusing on strategies to increase the educational attainment level of adults. Conducting comprehensive curricular review of academic programs is one approach to address the American skills gap by increasing degree completion through the alignment of academic program to identified workforce needs.

This dissertation presents information and detailed implementation strategies for higher education stakeholders to use in the alignment of academic programs with workforce needs. With solid support, human and financial resources, and professional development efforts in place, community colleges who use the Guide will be well-equipped to conduct comprehensive program reviews, ensuring the pipeline of college graduates needed to meet demands for America's future workforce.

KEY WORDS: Program review, curriculum, workforce

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CHAPTER ONE: INTRODUCTION TO THE STUDY

Introduction

Higher education is experiencing tremendous pressure to improve rates of degree completion to help the United States remain competitive in the global economy. Completion has become a high priority for community colleges driven by a reform movement led by federal and state policymakers, accreditors, foundations, businesses, and educators intended to dramatically increase the number of graduates from the nation's colleges and universities. At current rates of educational attainment, and as baby boomers retire, the pipeline of college graduates will not be enough to meet future workforce skills demands.

To meet workforce needs, colleges must determine if they are meeting the needs of both students and workforce. Program review is a process of evaluating educational programs to ensure that these programs meet the stated objectives and outcomes intended. Information provided through the program review process allows educators to make informed decisions regarding program improvements or the elimination of programs.

Background

Fewer than 40% of community college students earn a certificate or degree within six years of enrollment (Bailey et al. 2015). Individuals who do not complete any type of credential beyond a high school diploma face dramatically reduced earning potential (Belfield and Bailey,

2017). According to data from the U.S. Bureau of Labor Statistics, earnings increase and unemployment decreases as educational attainment rises (United States Bureau of Labor Statistics, 2016).

One of the eight educational goals listed in the Educate America Act of 2000 was that every adult would be literate, knowledgeable, and able to compete in the workplace (Cohen, et al, 2014, p. 236-237). The 2012 AACC report, *Reclaiming the American Dream*, expressed concern that there was a disconnect between employment preparation and workforce needs, and that employment preparation was inadequate for the current job market (AACC, 2012, p. viii,). That same report projected that, by 2018, almost two thirds of all American jobs would require at least a post-secondary certificate. According to a report from the Georgetown University Center on Education and the Workforce, by 2020, 65% of all jobs — compared to 28% in 1973 — would require some form of postsecondary education and training beyond high school. At current rates of educational attainment, the U.S. will have fallen short of the 65% of jobs that will require postsecondary education in 2020 by around 5 million workers (Carnevale, Smith, & Strohl, 2013).

Community Colleges' Role in Meeting Workforce Needs

In *Reinventing the Open Door*, James Jacobs states that workforce education is a common mission associated with community colleges (G. Myran, 2009, p. 109). This historical emphasis is supported by American Association of Community College (AACC)'s vision statement, which states that through AACC's leadership, community colleges will be promoted as the premier workforce development providers in America (AACC, 2022).

As Jacobs et al. (2019) noted, “Postsecondary workforce development is one of the major innovations of the modern community college” (p. 1). By providing open-admission opportunities in relevant career fields, community colleges provide effective regional training that includes three essential features:

1. Curriculum driven by the needs of local industry
2. Flexible delivery systems to meet both student and industry needs
3. Work-based learning with actual workforce equipment as well as classroom learning opportunities. (Jacobs et al., 2019)

Community colleges are well situated within communities to provide workforce training as they offer flexibility and affordability while being financially feasible (Bowles, 2014). Bowles provides such an example with the High-Demand Occupational Program (HOPE) at Patrick Henry Community College. The college, in collaboration with local business leaders, designs curriculum and provides financial assistance to both students and the college (2014). Atwell, Ecton, Klein, D’Amico, and Sublett (2022) provide three exemplars of college and industry partnerships: Shasta College in rural California, Mitchell Community College in a suburban area north of Charlotte, and Chattanooga State Community College in Chattanooga, Tennessee. All three programs had common themes of being nimble, responding to need, providing flexible program scheduling, and seeking needing funding through local, state, and federal agencies (Atwell, et al., 2021)

Growth and Change in Workforce Preparation

America’s technical and community colleges provide both transfer and career training opportunities for citizens in their service area. In the 2018 academic year, 6.2 million students

were enrolled in credit programs at the 1,043 community colleges in the United States (American Association of Community Colleges, 2022). These community colleges, comprehensive in nature, offer associate of science (A.S.) transfer degrees, as well as associate of applied science (A.A.S.) and certificates geared toward workforce training. In addition to having comprehensive community colleges that offer work force training, some states also support technical colleges.

America's technical and community colleges have historically provided this needed training. During community college's infancy stage in the early part of the twentieth century, these institutions provided a trained workforce for emerging and expanding industries. After World War II, the mission of community colleges expanded to include vocationalism, which provided training for American workers (Cohen, et al, 2014). In 1964, the American Association of Junior Colleges assembled an advisory committee to support this effort.

Federal Support for Workforce Training

Federal legislation and funding have augmented workforce training. These include the 1963 Vocational Education Act and amendments in 1968 and 1972, the Comprehensive Training and Employment Administration (1973), the Job Training Partnership Act of 1982, Workforce Innovation and Opportunity Act (WIOA), and the Carl D. Perkins Vocational Education Act of 1984 with subsequent reaffirmations.

In the 1990s, a federal initiative was launched, linking community colleges and high schools through which high school students could begin their career aspirations. Tech Prep provided a focus on workforce preparation in which students could continue their education

and training with the local community college. Tech Prep provided a foundation for emerging dual enrollment and early college programs that proliferated in subsequent years (Jacobs, et al., 2019).

Following the success of dual enrollment and early college programs, a more recent development, the Guided Pathways Model, provided the opportunity for high school students to focus on a career while still in high school with subsequent articulation to a technical or community college. The Guided Pathways Model has also been suggested as a method through which to increase completion rates. As articulated by Bailey, et al., (2015) and McClenney and Arnsparger (2012), community college students typically face a myriad of course offerings that creates confusion and often results in students taking too many unnecessary credits, resulting in wasted time and money (Jones, 2015). The Guided Pathways approach provides students with academic pathways aligned to meta-majors that are influenced by job demand, providing students with well-defined, labor-related knowledge and skills, thus increasing degree attainment.

Georgia's Guided Pathway Programs of Study

An example of a Guided Pathway approach that bridges high school to college can be found in Georgia. The Career Pathway Programs of Study is a collaboration between the Georgia Department of Education (GaDOE) and the Technical College System of Georgia (TCSG). High school students have two different options for beginning a career to college path. In one option, articulation agreements have been established between GaDOE programs and TCSG for students enrolling in one of the Career Pathway Programs of study not offered through dual

enrollment. The second option falls within the dual enrollment umbrella. Both of these options allow students to start their careers while in high school, providing them with an opportunity to earn credentials and advanced standing toward a degree while still in high school.

A more recent development, the federal *Strengthening Community Colleges (SCC) Initiative* and grant, provides the opportunity for community and technical colleges to strengthen ties with local business and industry. This opportunity allows for collaboration with employers to meet local workforce needs by supplying skilled workforce in high demand careers such as advanced manufacturing, healthcare, and information technology (Department of Labor, 2022). In addition, and due to the COVID healthcare crisis, the grant supports the development and expansion of these programs into a virtual environment, again, with the focus remaining on providing a trained workforce.

Aligning Market Needs with Academic Programming

For colleges to prepare an educated and trained workforce, their programs must remain relevant. Josh Davies, chief Executive Officer of the Center for the Work Ethic Development in Denver, Colorado, exposits in *2030: The Workplace Evolution,* (2020) that the modern workplace — and, thus, workforce needs — are constantly changing. Automation has replaced the need for manual labor. Automation — combined with advances in artificial intelligence — require that higher education prepare workers for this new environment.

Moore, Jez, Chisholm, and Shulock (2012) provided an outline for an effective workforce education program that includes:

1. Articulation agreements with K-12 programs

2. Programs which are adaptive to changing workforce needs
3. Pathways for entry-level credentials
4. ROI data

A relevant curriculum can not only focus on the present; it must look forward to the needs of the future. During a 2019 keynote address to the American Technical Education Association (ATEA) Region 5 conference, Jason Feist stated, “There is a massive need for workforce development in software, hardware, and infrastructure to enable value creation and decision making with artificial intelligence and machine learning” (Feist, 2019, p. 10). The workforce is always changing, and it will always require properly skilled employees.

And finally, a third component of workforce and academic alignment is the modality and shape of instruction. Many trade programs, such as welding, automotive technology and repair, diesel repair, industrial manufacturing, and heating/ventilation/and air conditioning (HVAC), have traditionally required hands-on training. However, recent experiences during COVID-19 pushed educators to develop alternative methods, recognizing that some of the instruction can occur online utilizing a hybrid method of instruction. Instead of sitting in a classroom and having the instructor lecture on required reading, the student reads the material online, utilizes online resources such as videos, chat sessions, or discussion boards. The instructor then provides additional assistance in the lab setting, in-person or virtual. This type of instruction will be relevant to the next generation (Feist, 2019, p. 10). As reported in *Students Speak: Are We Listening,* students place a high value on learning activities that require them to complete real tasks (McClenney & Arnsparger, 2012). While these activities are common in many vocational

programs the relevancy of the specific tasks and to the mastery of skills must be continually examined.

The outcome of workforce training has also been undergoing significant realignment and revision. In many institutions, flexibility has become the goal, with stackable or micro-credentials taking the place of one-time training programs or workforce certificates. These stackable certificates are designed to be completed in the short-term, but when taken in sequence and "stacked," provide a means for students to obtain an associate's or bachelor's degree. These credentials allow students to develop a skill and earn a credential that allows them to be more employable (Marcus, 2020); they also provide a reward that may encourage more education and training.

Evaluating the Alignment: Program Review Processes

In order to maintain relevancy, a view to future needs, and an awareness of appropriate and effective educational methods and outcomes, higher education must be prepared to examine its workforce training options systematically and intentionally. One established method for ongoing systematic review has been the Academic Program Review Process.

As Weikel-Delaplane and Arellano discussed in, *The Evolving Role of Community Colleges in Workforce Development (2021),* community colleges have struggled with assessing the efficacy of workforce education programs resulting in few examples of program review. However, three review templates were discussed in their 2021 work: *Programs of Study (POS) Design Framework* by Bragg (2017), *The Instructional Program Improvement Resource Guide*

developed in 2003 by the Community College System of California, and *Steps for Conducting a Return on Investment (ROI) Model* by Kotamraju (2011).

In the Program of Study (POS) Design Framework, Bragg (2017) identifies 10 elements of program evaluation:

1. Related legislation and policy
2. Partnerships
3. Professional development opportunities for faculty and students
4. Implementation of accountability and evaluation systems
5. Consideration of college and career readiness standards
6. Availability of course sequences
7. Ease and availability of credit transfer agreements
8. Quality and availability of academic advisement
9. Quality of teaching and learning strategies
10. Technical skills assessment of students.

In addition to the POS model, Bragg (2017) also refers to the Pathways to Results model developed in 2009 by the Illinois Community College Board (ICCB) and the University of Illinois, Urbana-Champaign as providing key components of a successful evaluation model. This consists of a five-step process:

1. Engagement and commitment
2. Outcomes and equity assessment
3. Process assessment
4. Process improvement and evaluation
5. Review and reflection

The second review template, *The Instructional Program Improvement Resource Guide,* was developed in 2003 by the Community College System of California. The Guide was developed to support and advance instructional program innovation and continuous program review. The Guide offers a five-step program evaluation process:

1. Documenting program results
2. Analyzing key performance indicators
3. Identifying direct or root causes of differences
4. Selecting best solutions to impact desired outcomes
5. Pilot testing solutions and implementing best results.

The third review model, *A Return on Investment (ROI) approach*, was developed in 2011 by Kotamraju to determine whether or not college workforce development programs produced a return on investment. Kotamraju (2011) recommends the following five steps be included in conducting a ROI review:

1. Needs assessment
2. Feasibility study
3. Process Evaluation
4. Outcomes Evaluation
5. Cost Analysis

As examples of program review models, each provide the community college professional an opportunity to review and contrast the components of each approach, thus providing the opportunity to determine which components are most usable for their college or system review. Two approaches were developed to determine program efficacy for Illinois Community Colleges (POS) and the California Community College system (Instructional Program

Improvement Guide). Both contain components that both systems determined to be critical to the analysis of academic programs.

Statement of the Problem

Limited program review examples, however, were found in current literature, and none since the COVID healthcare crisis. This is supported by Weikel-Delaplane, et al. (2021) who assert that community colleges have struggled with assessing the efficacy of workforce education programs resulting in few examples of effective program review processes. Of the three models presented in this work, each contained different components. For example, while Kotamraju's, ROI approach (2011) focused on the financial aspect of academic programs, it does not provide for the inclusion of feedback from industry partners. None of the program reviews identified clearly addressed the question, "Are the college academic programs meeting current workforce needs?"

Purpose of this Guide

This product dissertation provides a guide for higher education institutions to implement an effective and comprehensive program review to ensure alignment with business and industry needs. While this Guide provides specific direction for technical and community colleges, the approach can be applied in any higher education setting. The purpose of the Guide is to provide a usable structure for colleges or systems to deploy in a comprehensive program review process. In addition to providing a rationale and approach to workforce program evaluation, insights gained from existing approaches and strategies are included to help with the implementation process.

Conducting a comprehensive program review provides an opportunity to discover and eliminate curriculum "drift" when changes occur requiring new skills and technology and curriculum "bloat," which occurs over time due to retaining everything (Downs, 2020). Curriculum drift is defined as a process in which the learning experiences and content do not match specific desired learning outcomes (Woods, 2015, pp. 641-644), such as content and activities that have no relevance to mastering skills needed for employment. Curriculum bloat occurs when additional courses are added to a program length. In both instances, program length can be impacted prolonging completion and employment.

Development Assumptions and Research Questions

Foundational to the development of this Guide was the key operational question: How can data help technical and community colleges apply market projections and current program capacities in order to align program enhancements as well as better allocate resources to meet future market needs? The following three specific questions then guided the research, development, and implementation of the Guide:

1. What data will help community colleges determine current and projected market needs?
2. What data will help community colleges identify current program availability and resources, as well as growth capabilities, or the elimination of programs?
3. How can community colleges use available data to determine appropriate allocation of resources to better meet current and projected market needs?

Overview to the Guide

As previously stated by Weikel-Deplane et al. (2021), there are few examples of effective program review processes. Thus, this Guide, *Program Review: A Practical Guide for Technical and Community College*s, adds to the available program review examples. The intent of the Guide is to provide a process through which to determine the efficacy of academic programs and workforce needs.

The Guide is organized into six chapters, with focus given to developing a systematic process, the importance of research and planning, identifying what data to collect, and the appropriate usage of the data. Methods for gathering industry input is also discussed along with the evaluation of resource allocations and cost analysis. As, as noted, while the Guide was initially developed to serve the needs of workforce programming at technical colleges, this Guide can be used in any geographic or demographic area and can be altered to meet any unique regional situations.

Definition of Terms

Several key terms are used throughout this dissertation and are defined as follows:

- **Advanced Standing** allows a student to receive course credit based on previous experience, formal or informal, and results in credit towards a program of study (TCSG Policy Manual, 2022).
- The **Associate of Applied Science** (A.A.S.) degree is offered for technical program students who intend to enter the workforce upon graduation.
- The **Associate of Science** (A.S.) degree is offered for students who intend to enter the workforce and/or immediately continue their education at the baccalaureate level.

- **Technical Certificate of Credit** is offered for students who intend to enter the workforce. These certificates are comprised of workforce courses and range from 9 to 36 credit hours in length (TCSG Policy Manual, 2022).

- **Workforce Certification** is issued upon completion of a course of training with standardized industry assessment often required.

- **Course Competencies** are identified skills and tasks required within a course.

- **Credit Hour** represents an amount of work required to master intended learning outcomes and verified by evidence of student achievement that is an institutionally established equivalency (U.S. Department of Education guidance to institutions and accrediting agencies published on October 29, 2010).

- **Curriculum Crosswalk** is a process used to cross reference or align the learning outcomes of the courses in a pathway. It can also be used as a pathway between non-credit and credit programs.

- **Diplomas** are credentials offered for students who intend to enter the workforce. These diplomas are comprised of mainly workforce courses and range from 37–59 hours in length (TCSG Policy Manual, 2022).

- **Dual Enrollment** programs are designed to prepare high school students for college and career opportunities leading students to postsecondary institutions for an industry recognized certification or licensure, an associate's and/or higher college degree, and successful employment (Georgia Department of Education, 2020).

- **Program Outcomes** are the defined intended goals of a program (The Glossary of Education Reform, 2013).

- **Workforce** development is a set of solutions to meet employment needs (Miller, 2018).

- **Skills gap** defines the difference between the skills needed by industry and the skills that employees possess.

Conclusion

Following this introduction, this dissertation is presented in four additional chapters, followed by a bibliography and appendices. Chapter Two provides a review of the literature related to workforce needs and how technical and community colleges can meet those training

needs. Chapter Three describes the process, insights, and components used to create the Guide. Chapter Four presents the Guide, *Program Review: A Practical Guide for Technical and Community Colleges.* Chapter Five discusses the implementation challenges for the Guide, discusses the Guide's delimitations and assumptions, and recommends future research that could extend the value of the Guide.

Several challenges — including the time it takes students to complete a credential, the low percentage of learners actually earning a degree, and the current and future need for a college-educated, skilled workforce — have placed a critical burden on colleges and systems to ensure that academic and workforce programs are meeting the need of today's workforce. To support the economic empowerment of workforce regions, it is critical that colleges and systems provide programs that are aligned with workforce needs. Community colleges and industry must work together in meeting workforce needs, including establishing a continuous evaluation approach to determine if these academic programs are meeting workforce needs (Weikel-Delaplane, et al, 2021).

CHAPTER TWO: LITERATURE REVIEW

Introduction

Meeting workforce needs is a common mission of community and technical colleges, having historically provided this needed training since the first community college, Joliet Junior College, was founded in the early part of the twentieth century. During community colleges' infancy stage, these institutions provided a trained workforce for emerging and expanding industries. After World War II, the mission of community colleges expanded to include vocationalism, which provided training for American workers (Cohen, et al, 2014). As Jacobs and Worth (2019) noted, "Postsecondary workforce development is one of the major innovations of the modern community college" (p. 1).

In 2012, the American Association of Community Colleges (AACC) produced *Reclaiming the American Dream: Community Colleges and the Nation's future.* Three recommendations were made, one of which is to close the skills gap by focusing on career and technical education through preparation for existing and future jobs. Implementation strategies include collaboration and developing partnerships with local employers, developing stackable credentials aimed at meeting workforce needs, and accurately identifying labor market data.

In 2019, Terry O'Banion published *A Brief History of Workforce Education in Community Colleges.* O'Banion provided a timeline of critical federal vocational acts that have benefited community colleges and impacted the growth of occupational education, starting with the First Morrill Act of 1862 and ending with the Workforce Innovation and Opportunity Act (WIOA) in

2014. Highlighted in the publication are four innovations that he contends were transforming workforce development in the community college. Those include the issuance of baccalaureate degrees by community colleges, apprenticeships, growth of STEM, and credentials less than associate degrees, specifically, technical certificates. All four of these innovations are workforce driven.

The means through which this training occurs is found in both credit and non-credit programs. Various names are associated with this training: vocational education, career and technical education (CTE), and occupational training. For the purpose of this dissertation, focus has been placed on credit-based programs.

The review of this literature presents research on the development and implementation of academic program review. This chapter provides an overview of selected research focused on elements of program review and alignment of academic programs to workforce needs. For this review, literature is organized and presented in two groups: (a) existing examples and research of academic program review and (b) research and data reflecting workforce needs.

Academic Program Review

Literature and research on academic program review is scarce, as noted throughout the dissertation. A broader categorization can be found by looking at program prioritization. Program prioritization is a process through which a college or system decides which academic programs to offer and those to not offer. Program review, as described in this dissertation, could be one component of program prioritization.

Dickeson's seminal book, *Prioritizing Academic Programs and Services (2010)*, originally published in 1999, provides a comprehensive look at academic program prioritization. As a former university president, Dickeson dealt with competing struggles of offering high quality academic programs while weighing available financial resources. In addition, factors impacting the need for prioritization include increased levels of governmental interference, decreased revenue, and increased cost to run programs. His list of 10 criteria for program prioritization are referenced in other works as the best practice model: the history, development, and expectations of a program; internal and external demand for the program; quality of program processes and outcomes; size, scope, and productivity of the program; revenue generated and costs associated to run the program; impact and justification of the program; opportunity analysis of the program. This second edition also provides resources and reports from colleges that used the suggested 10 criteria.

Similar to the reasons for prioritization highlighted by Dickeson — increased costs, decreased revenue, and external forces — Henry, Pagano, Duckett, & Wilson (2014), published the report, *5 Trends to Watch in Higher Education.* Upon researching institutions for a 12-month period, they found that the following trends were impacting the need for new strategies: decreasing funds, demands for greater ROI, greater student outcomes transparency, new delivery models such as competency-based learning and expansion of online learning, and the acceleration of global education. They suggest that colleges must look at holistic and long-term measures by looking at the market segment in which they operate, student targets, and the alignment of academic programs to market needs. While Henry, et al.'s, suggestions do not include the ROI component of Dickeson's 10 criteria, both focus on outcomes and alignment.

Shifting to focus on what academic prioritization might be occurring, in the 2015, Academic Impressions report, *Meeting the Challenge of Program Prioritization,* Mrig, et al. presented a report of *115* colleges that were surveyed to determine if program prioritization was occurring at their institution. Of the 115 institutions, 26% responded that they planned to implement in the future, 49% had undertaken a program prioritization process, and 25% responded that there were no plans to conduct program prioritization at their institution. Of 2-year colleges, 44% responded that their institution was planning to conduct program prioritization in the future, 28% were currently undergoing this process, and 28% had no plans to do so. Of note, the reasons for not utilizing a program prioritization process indicated the fear of change and faculty's ownership of programs, not being able to access needed data, and the lack of will to make tough decisions should programs need to be eliminated.

Fannin and Saran (2017), searching back a decade, sought to identify the models used for this process in comparison to those suggested in literature. By conducting internet searches, they identified 30 universities that had conducted some form of program prioritization with published results. Enrollment in these colleges varied from 4,000 to 30,000 students and covered all regions of the United States. They found commonalities in the criteria used: program quality, mission centeredness, financial health, and program demand. In their conclusion they noted that while data was used in the process, ultimately in every instance, subjective calls were made regarding whether to invest more money, maintain current budget, reduce funding, or eliminate the program(s).

Program Review and Workforce Training Programs

Pusser and Levin noted in their 2009 report that community colleges face increasing pressure to serve as workforce training leaders and in order to meet this need, these institutions need to "reimagine" their vocational and occupational programs to meet both student and workforce needs. Critical to this task is the need to determine what programs actually meet workforce needs. Thus, the need to conduct program reviews. Research on existing or historic program reviews are scarce. This is iterated most recently by Weikel-Delaplane and Arellano (2021) in *The Evolving Role of Community Colleges in Workforce Development* where they noted that community colleges have struggled with assessing the efficacy of workforce education programs resulting in few examples of program review. As part of their research, three review templates were presented: *Programs of Study (POS) Design Framework* by Bragg (2017), *The Instructional Program Improvement Resource Guide* developed in 2003 by the Community College System of California, and *Steps for Conducting a Return on Investment (ROI) Model* by Kotamraju (2011).

While dated, the model developed by the Community College System of California still provides relevancy in 2022. The Guide was developed to support and advance instructional program innovation and continuous program review. The Guide offers a five-step program evaluation process: (1) Documenting program results, (2) Analyzing key performance indicators, (3) Identifying direct or root causes of differences, (4) Selecting best solutions to impact desired outcomes, and (5) Pilot testing solutions and implementing best results.

A Return on Investment (ROI) Approach was developed in 2011 by Kotamraju to determine whether or not college workforce development programs produced a return on

investment. Kotamraju (2011) recommended the following five steps be included in conducting a ROI review: (1) Needs assessment, (2) Feasibility study, (3) Process Evaluation, (4) Outcomes Evaluation, and (5) Cost Analysis.

In the Program of Study (POS) Design Framework, Bragg (2017) identifies 10 elements of program evaluation that included partnerships, consideration of college and career readiness standards, and technical skills assessment of students.

Bragg (2017) also refers to the Pathways to Results model developed in 2009 by the Illinois Community College Board (ICCB) and the University of Illinois, Urbana-Champaign, as providing key components of a successful evaluation model. This, too, consists of a five-step process: (1) Engagement and commitment, (2) Outcomes and equity assessment, (3) Process assessment, (4) Process improvement and evaluation, and (5) Review and reflection.

After viewing campuses engage in program review, Eggleston (2020) provides a shared definition of program review, which she feels is lacking. The article articulates that program review is a comprehensive look at academic programs and should include a review of staffing and assessment of learning outcomes, both elements missing from program review models listed in this dissertation. Of note, the alignment with external accrediting agencies such as nursing boards is mentioned as a critical element to include in the program review process. The article presents questions for colleges to use as guidance.

In 2021, Ada, Sagnak, and Ilic presented a framework for identifying skills needed for Industry 4.0. Although the authors are Turkish, their research is applicable for American technical and community colleges as these colleges are training students for Industry 4.0 jobs. This trend was also evidenced by articles in the Spring/Summer 2019 *American Technical*

Education Association journal. Randy Swearer, vice president of Learning with Autodesk, and Paul Perkins, president and CEO of Amatrol, discussed modern technology needs and how, in partnerships with technical and community colleges, advanced training is meeting workforce needs. The framework suggested by Ada et al. involves collaborating with experts that include educators as well as industry.

Most recently, Rockey and Bourne (2022), addressed the value of an annual program review process highlighting the efforts of the Illinois Community College Board (ICCB) in regard to their established program review process. As identified earlier in this chapter, the ICCB review process was established to be conducted every five years. A new annual review template was developed by a new Program Review Advisory Committee (PRAC) consisting of college faculty, staff, and local advisory board members. Three goals were identified: (1) Identify challenges, redundancies, and omissions; (2) Implement or increase professional development and technical support; and (3) Improve the application of review findings in programs.

Defining Workforce Need

Market Predictors

In their 2016 book, *Preparing for a World that Doesn't Exist — Yet*, Smyre and Richardson cite a 2000 Hewlett Packard blog post that predicted that, by 2020, 40% of the professions and jobs that existed in 2020 would evolve from technologies that did not exist in 2000. They emphasized that forward thinking in the search for market data to support the development or revision of academic programs to meet workforce needs is needed. Smyre and

Richardson (2016) also predict an increased need for advanced computerization, deep data, composite materials, artificial intelligence, and increased technology skills.

The Center on Education and the Workforce (CEW) at Georgetown University conducts research on education at all levels and current workforce trends. Carnevale, Garcia, and Gulish in their 2017 report, *Career Pathways: Five Ways to Connect College and Careers*, presented five practices that colleges can implement to better align postsecondary education and workforce. Two of their areas of emphasis include program alignment with labor market demand and curricular alignment with workforce requirements. Both practices involve the collection and review of data relevant to local labor needs.

Carnevale, Strohl, Ridley, and Gulish published a report in 2018 titled, *Three Educational Pathways to Good Jobs: High School, Middle Skills, and Bachelor Degrees*. In this report, middle skill jobs were identified as the fastest growing of the three categories, and required post-secondary education credentials such as certificates, diplomas, or associate degrees. They made note in this report that good jobs can be attained in programs that are well aligned to labor market needs.

In *The Workforce Playbook: A Community College Guide to Delivering Excellent Career and Technical Education* (2019), Davidson, Henthorne, Ilakkuvan, Perlstein, Witham, and Wyner categorized four domains of essential practices that excellent colleges demonstrate. The second domain, Deliver High Quality Programs Aligned to Regional Needs, includes the implementation of impactful program reviews. Exceptional program reviews include an annual review of programs that include gathering feedback from faculty, administration, industry advisory councils; analyzing regional data; and assuring transparency in the process. Examples of college

excellence in this domain include Valencia College, Columbus State Community College, Northeast Wisconsin Technical College, and Clark State in Ohio.

In 2019, Stevens, et al. published a report focused on labor market outcomes of Career and Technical Education (CTE) programs. Research was conducted using data from the California Community College system. Also in 2019, Cotner's work encouraged colleges to pay attention to trends. In contacts with business and industry, inquire what impacts automation and artificial intelligence will have on hiring needs: What skills will be needed, and will this necessitate program changes to meet these new skills?

In 2021, Atwell, et al. stressed the need for community colleges to use labor market data in order to align academic programs with workforce demand. Three exemplars were highlighted at rural, urban, and suburban community colleges. Shasta College in California (rural), Chattanooga State Community College in Tennessee (urban), and Mitchell Community College in North Carolina (Suburban). In all three colleges, data was used to drive the discussion with local business and industry. The execution of successful apprenticeship programs was found to be a common thread among all three.

Also published in 2021 was a report by Sublett and Tovar. They conducted research to determine the alignment between community college students' majors and projected workforce needs. Their sample size consisted of 4,950 students enrolled between 2011 and 2014. Data was used from the National Center for Educational Statistics (NCES) and the Beginning Postsecondary Student Longitudinal Study. All students had declared majors within the 16 Career Technical Education Clusters. To their surprise, the study revealed that by in large, the students in the sample did not select majors based on market projects. Sublett and

Tovar hypothesized three possible reasons for that occurrence: (1) Students considered skills rather than credentials; (2) High demand workforce programs were not offered; (3) the classification system used to sort — CIP and SOC codes — are artificial. In their conclusion, the authors suggest the need for qualitative research to determine reasons that students select majors. In addition, they strongly recommend that workforce data be shared with colleges to help better inform colleges of needed academic programs.

Market Data

The use of market data is critical in the process of program review. In order to meet workforce needs, colleges must first know what those needs are. There are several key questions to ask and areas to investigate: What is the need and demand for higher education and job training in the area? Do the two (need and demand) overlap? Does the college's existing programming currently meet the needed demand? Does the state collect data and publish a list of high-demand careers? Are these identified careers matched to the institution's existing program offerings?

Unfortunately, there is no consistency of sources as market data vary from state to state. Ganzglass (2014) highlights Kentucky as a state that requires requests for new programs to use the DACUM (Developing A CurriculUM) process. An occupational task analysis is conducted and real time labor market information (LMI) from Burning Glass is used.

Many states and/or higher education systems prepare and publish annual descriptions of workforce needs and projections. The Tennessee Board of Regents (2018), for example, published a report describing employment needs based on required educational attainment

levels and current unemployment rates linked to a geographic distribution of related higher education programs. This report also includes demographic and labor market data and workforce maps.

Atwell et al. (2021) provided an example for Chattanooga State Community College in Tennessee. The Chattanooga Chamber of Commerce takes the lead and provides a report to the college about current and future workforce needs. This information is gathered through surveys and direct interviews. In addition, the college stays in constant contact with the local American Job Center and WIOA board. Atwell et al. (2021) also noted that the college has developed close working partnerships with business information and do not solely rely on advisory board feedback.

In Indiana, the Department of Workforce Development provides a website that delivers detailed job needs (Indiana Department of Workforce Development, 2022). "*Hoosiers by the Numbers,"* for example, provides workforce demographic and statistics by region. The site also includes maps, charts, and infographics. Colleges and universities in Indiana then use this information to determine program needs based on projected workforce changes.

Another key source of information is labor market data for both national and local areas. There are multiple sources of this data. First, national data can be found by accessing the U.S. Department of Labor website: the Employment and Unemployment site (2022). At this location, national, state, and local employment data can be found. Other sites will provide demographic and geographic data. Secondly, you can access state and regional data through your state agency. For example, the Georgia Department of Labor collects, analyzes, and publishes current information about the economy, job market, and needs on the site, "Get

Labor Market Information" (Georgia Department of Labor, 2022). In addition to overall labor market information, Georgia's website provides local analysis. Look for similar sources in your area.

A final resource is the use of a labor market data company, such as Lightcast (formerly known as Emsi), which provides economic modeling reports for a region or state. Lightcast will custom the solution to the institution's needs that can include an analysis of labor market data and a gap analysis (Lightcast, 2022).

Partnerships

Community colleges sit in a unique position with local government and industry. As such, they have the opportunity to develop partnerships aimed at workforce training to meet local needs. This is not a new concept. Orr (2001) published an article focusing on the critical need for collaboration among communities and community colleges though which to meet workforce needs in what was labeled, "new vocationalism." New vocationalism was a term used to emphasize vocational-technical education to meet the training needs of new skills and technologies. Texas Instruments was given as an example of a partnership built with the local community college that provided training for the company. Central Piedmont Community College in North Carolina was also cited as a positive partnership example with local business and industry. Then, as now, community colleges have resources to offer in the training of a skilled workforce: academic and training curriculum, training facilities, student advisement and outreach to students, and flexibility.

Bowles (2014) provides examples from Patrick Henry Community College in Virginia, Delaware County Community College in Media, Pennsylvania, and Grand Rapids Community College in Michigan. At Patrick Henry, local business owners work directly with the college to design curriculum based on needed skills for the job market. Students at Grand Rapids Community College have an opportunity to work in a factory four days a week, and in the classroom one day per week. A similar experience with a hydraulic drill industry is provided at Delaware County Community College.

In the 2014 AACC, *Empowering Community Colleges to Build the Nation's Future: An Implementation Guide,* one of the recommendations provided is to actively engage with, and develop partnerships with, business and industry, as well as local Workforce Investment boards. A second recommendation, and one through which a college can provide the training needed for businesses in this partnership, is to incorporate more work-based learning. This can take the shape of apprenticeships or internships.

As part of their executive summary, Campbell et al. (2016) noted that the success of our nation's economy rests within our communities. The full report published by the Education Commission of the States (ECS) discusses building and leveraging partnerships between community colleges, local industry, and the use of Workforce innovation and Opportunity ACT (WIOA) of 2014 funds. Examples included in the report include Alaska, which has developed pathways into industry which are critical to the state's economy.

San Diego Community College District (SDCCD) has developed solid partnerships in manufacturing and healthcare through which to fund program growth directed at meeting local workforce needs (Carroll, 2016). Jacoby (2017) stated that community colleges are the only

higher education institutions with the reach and scale to meet workforce needs. To meet those needs, cooperation between colleges and employers is critical. Partnerships between community colleges and employers ensure that students are learning the in-demand skills needed to meet workforce needs. Jacoby also asserts the need for program review through the use of data to measure outcomes, including enrollment, completion rates, and job placement.

Davidson, et al.'s (2019) work, *The Workforce Playbook: A Community College Guide to Delivering Excellent Career and Technical Education,* explained in their fourth playbook "domain" that excellent colleges develop responsive, mutually beneficial partnerships with employers. Furthermore, these colleges with strong workforce outcomes adapt to regional work needs.

Jacobs and Worth (2019) provided a picture of a different type of partnership that involves community college workforce development networks. In this model, community colleges in the Midwest collaborated to develop the Community College Workforce Consortium (CCWC). Colleges in this consortium developed joint programs and shared resources. [Unfortunately, it appears that this consortium no longer exists.] However, another initiative highlighted in their publication does exist is the National Coalition of Certification Centers (NC3). Initially developed through the efforts of Gateway College in Kenosha, Wisconsin, the Center includes over 75 colleges working in partnership with major employers such as Trane, 3M, Snap-on, and Kubota. The Center's mission is connecting employers and educational institutions in cooperative partnerships that foster effective training to meet current workforce needs (National Coalition of Certification Centers, 2022).

Hellyer and Jones (2020) highlight apprenticeship programs that they contend are the oldest examples of partnerships between colleges and industry existing for centuries, providing students with an education and on the job training. Hellyer, president of San Jacinto College in Houston, presented successful examples of partnerships between her college and industries: Dow Chemical, Schuetz Containers, and Port Houston. She stresses the need for successful apprenticeships to be flexible and for the college to be open to customizing curriculum to meet workforce needs.

Most recently, Dr. Jeff Pittman, chancellor of St. Louis Community College, iterated the need for community colleges to map their curriculum with workforce needs (2021). This should include K-12 and university partners in order to provide pathways from high school to community college, to workforce or on to a four-year university. This process and partnerships are needed to meet the expanding workforce needs of middle-skilled jobs.

Advisory Boards

The use of program advisory boards to design, develop, and evaluate academic programing is not new. There is a rich history through which to view advisory boards and committees. In a report for the American Association of Junior Colleges, Riendeau (1967) described three types of advisory boards, which still exist today: (1) apprenticeship; (2) occupational, which provides guidance and feedback for specific trades, and (3) general, which review and advise from a broader perspective. Members of advisory boards are members of the community and represent business and industry. Today, colleges determine the scope of

these advisory boards, but the board membership and objective remain the same — to provide feedback and guidance regarding the efficacy of academic programs.

This report was followed up by Harrison (1975), who iterated that the purpose of the advisory committee (board) was to serve the community, and act as a liaison between the community and the community colleges as an informant of what academic programs should contain. Harrison added an additional type, judicial advisory committee, to the three suggested by Riendeau (1967).

Moving forward several decades, research provided a guide developed for Minnesota technical program advisory committees (Mercer & Dillon, 1997). A useful and still relevant guide, it provides readers a practical manual covering the purpose, organization, and structure of advisory committees. In addition, the guide provides how to work together as a committee to meet the needs of the community and college.

Genheimer and Shehab (2009) conducted a survey of 208 engineering school directors to determine the operation and effectiveness of Industry Advisory Boards (IAB). The relevancy of this research pinpoints the need for clear communication between academic programs and the role and goal of the IAB. Seven survey categories sought to determine the correlation between what the program directors felt were important roles of the IAB and, conversely, what the IAB felt were important roles. Agreement between both groups were found for advocacy, program assistance, research, health and development, and assistance with ABET accreditation. However, two areas did see differences. Board members saw their role of providing curriculum input of more importance than the program director, and a high disproportion of program directors saw the role of IAB as fund raisers of greater importance than the IAB.

In *Developing a High-Impact Industry Advisory Board*, presented at the 2014 ASEE North Midwest Sector Conference, McIntyre and Fox provide guidance for developing an effective advisory board. Much like the Minnesota guide, (Mercer et al., 1997), McIntyre et al. (2014) deliver recommendations in the development of advisory boards, which they refer to as an industry advisory board (IAB). The stated purpose of these boards is to advise by reviewing academic program goals while incorporating industry standards; assist programs by providing financial assistance, including student scholarships; providing guest lectures, and judging skills events; and advocating and supporting the academic programs. Their recommendations include developing a work plan including a self-assessment and evaluation process administered annually. This, they state, is critical in order for the IAB to function and provide academic programs with needed support.

Because of calls for greater accountability from accrediting bodies, Schaeffer and Rouse (2014) advocate for the utilization of academic advisory committees. As experts in their fields, advisory committee members can provide advice and guidance as well as program assistance, support, promotion, and advocacy. Similar to other articles reviewed, they stressed the need for established goals and objectives to allow for long-term successful relationships.

Pathways

In the 2014 AACC, *Empowering Community Colleges to Build the Nation's Future: An Implementation Guide,* as a strategy to close the skills gap, the authors included recommendations to design academic programs linked to workforce needs through the development of guided pathways and the use of stackable credentials. Following this work, in

2015, Stan Jones, Complete College America President, produced five “game changers” for student success. One of the five game changers is *Guided Pathways to Success.* Guided pathways are developed to include highly focused curriculum and only those courses needed for completion of a credential — a certificate, diploma, or degree (Jones, 2015). In 2015, as part of their work for the Community College Research Center (CCRC), Bailey, Jaggars, and Jenkins iterated the need for the development of Guided Pathways through which to increase completion rates in academic programs. They included the expansion of the pathways to reach back to high school, with the inclusion of dual enrollment courses. This gives students a head start to program completion.

In 2016, Jenkins was again part of a research group assessing the efficacy of structure and Guided Pathways in community colleges. Van Noy, Trimble, Jenkins, Barnett, and Wachen (2016), published an article titled, *“Guided Pathways to Careers – Four Dimensions of Structure in Community College Career-Technical Programs.”* A qualitative search study was conducted at Washington State Community and Technical Colleges. Working from an assertion that students from low-income and first-generation families would lack knowledge of how best to navigate career as well as course choices, they evaluated programs along four dimensions: (1) Program length and required courses; (2) Program alignment to workforce needs; (3) Student access to career and program information; and (4) Intentional advising. They found a high level of structure in allied health, computer and information systems, and mechanics and repair programs. These programs limited electives and used workforce and advisory boards to determine program content, thereby aligning with workforce needs and eliminating needless

courses, and used effective scheduling techniques such as block scheduling. They recommended all of these strategies for successful pathway programs.

Jenkins, Lahr, and Fink (2022) published a reflection paper on what has been learned about Guided Pathways since the 2015 report from CCRC. They reviewed program design; student onboarding, which includes advising; remediation and academic support; as well as teaching and learning. Their findings still support Guided Pathways but also make recommendations for institutions moving forward in the areas reviewed. First, colleges must ensure that the program has value. First, it must be aligned to workforce needs or clearly articulated bachelor programs, thus providing assurance that there will be a job waiting for students. Students should be provided with career exploration opportunities early in their education. To support student efforts to find employment in their field, institutions must help students make connections with faculty and staff as well as employers. Both concepts were reported to be critical to student success in career programs over a decade earlier by Hirschy et al. (2011). Learning opportunities should be active and experiential and include what they refer to as, “light the fire” moments. In terms of remediation and academic support, Jenkins et al. (2022) continue to support corequisite education and multiple placement measures citing Ran and Lin (2019), who conducted research with the Tennessee Board of Regents 13 community colleges. Ran and Lin (2019) found that students benefited from being placed directly into college math and English courses with academic support and were just as likely to pass those gateway courses as those students who directly placed into college math and English. Jenkins et al. (2022) contend that initiative is still a vital part of Guided Pathways, and with the other recommendations, again, support Guided Pathways continuation.

In addition to Guided Pathways, reference in literature is given to Career Pathways. In 2014, the Center for Law and Social Policy (CLASP) established the Alliance for Quality Career Pathways consisting of community college educators, higher education system leaders, and state workforce personnel from ten states. The overall goal of the project was to develop a framework through which to strengthen state and regional economies by filling workforce shortages. This objective is accomplished by developing more focused training programs, using data, and increasing industry partnerships. Over a 2-year period, the Alliance developed the Framework document that includes a working definition and conceptual model. The framework also provides examples from the states participating in the Alliance, participant metrics, and criteria for developing a quality system.

Kazis, R. (2016) provides a policy brief for Manpower Demonstration Research Corporation (MDRC) addressing Career Pathways. In this brief, Career Pathways are defined as clearly defined skill training programs which provide credentials and lead to employment. These programs are provided in secondary educational institutions and colleges. Examples are provided of secondary school models, those addressing out of school and disconnected youth, and low income adults. Kazis recommends aligning programs between systems, such as secondary to post-secondary institutions. He also iterated that demand side matters: seek input and alignment with business and industry.

In a policy brief for CLASP, Mortrude (2018) highlighted the July 2018 meeting, titled, “Maximizing the Power of Pathways: Vital Career Pathway Conversations.” In attendance were representatives from national education and workforce development leaders. A history of career and guided pathway efforts were presented, best practices noted, and

recommendations for improvement through which to increase student completion of needed workforce programs. In this article, career pathways is defined as the process to align training programs at colleges, adult education programs, and local workforce development boards with documented workforce needs. Guided pathways is defined as the curricular pathway from secondary through bachelor programs. Guided pathways provide an on and off-ramp for students at various points: earned short-term credential, associate of science (AS) or associate of applied science (AAS), or bachelor degrees in technical fields. Washington State's IBEST program and the Illinois career pathway model were highlighted as best practice models. Recommendations included linking career and guided pathway efforts and including business and industry in the development of these programs. Again, targeting the program to meet statewide workforce needs.

O'Banion, in *13 Ideas That Are Transforming the Community College World* (2019), reminds the reader that the development of pathways is not new. Pathway work emerged from the work on Tech Prep which was supported by the Carl D. Perkins Vocational and Applied Technology Act in 1990. Tech Prep allowed students to focus on careers while in high school, earning credits which were articulated to their local community college. That work continues today with the Guided Pathways model.

Connected to pathways programming, Ganzglass (2014) provides a brief, but comprehensive report of the need for stackable credentials. Gansglass interviewed state officials in Kentucky, Oregon, Virginia, and Wisconsin, as well as faculty from colleges in each state. Stackable credentials were a core feature of career pathways in each state. To meet workforce needs and to better connect students with careers, the article highlights the need to

modularize existing programs, embed existing certifications in programs, streamline processes, and create a “lattice” credential that allows for vertical as well as horizontal skills development.

Prior to the Ganzglass report, Spak (2013), reported on stackable credentials as a “new” innovation which could close the skills gap and provide more trained workers in advanced manufacturing. At the time of his 2013 article, the National Association of Manufacturing (NAM) had created training units referred to as “Stackables” and this curriculum was being piloted in Ohio, North Carolina, Texas, and Washington.

Audant (2016), conducted a research study at her institution — Kingsborough Community College (KCC), CUNY — to review stackable credentials in Culinary Arts. KCC offers a 60-credit hour Associate of Applied Science (AAS) degree in Culinary Arts. Two stackable credentials exist within the program. Emphasis was placed primarily on the 7-credit, Certification of Completion degree with a sample size of 209. Of the 209, 12% continued their educational pursuits within the 2 years of the research; 50% were gainfully employed in their field upon graduation. The article did not provide the employment information for the second certificate nor for the AAS degree. The author did discuss the need for additional embedded math and reading instruction in the program, and increased industry input into the course curriculum.

In *Stackable Credentials: Awards for the Future?* Bailey and Belfield (2017) question the need for, and efficacy of, stackable credentials, which they described as a group of courses that allow students to progress through an associate degree program, earning employable credentials that are then “stacked.” Bailey and Belfield (2017) referenced the 2015 work by

Bailey, et al. in their report, concluding that stackable credentials work most effectively if part of a Guided Pathways program.

Jacoby (2017) highlights the use of stackable credentials through which to meet workforce needs. Stackable credentials are short-term and include fewer requirements than an associate degree, may result in a technical certificate, and can include industry certifications. Students can earn multiple certifications or certificates that enhance job skills and possibly lead toward an associate degree. Stackable credentials continue to be emphasized in the literature over the next couple of years. In *Preparing for the Future of Work,* Cotner (2019), in fact, stressed leveraging stackable credentials as a tool to meet workforce needs as these credentials are shorter and more accessible than longer associate degree requirements. They are also applicable for shorter programs directed at "upskilling" currently employed workers.

Bohn and McConville (2018), conducted research at the California community colleges seeking to quantify how many students earned more than one short-term certificate, of 6-29 credits that was considered a stackable credential. Recognizing that community colleges provide a strong, trained workforce, they examined 200,000 students. Their findings showed that one in 4 students earn a second credential within 3 years. Their findings also reflected that students are 10-16% more likely to earn stackable credentials when career education programs have an explicit and clear pathway for students to do so, therefore, a recommendation to strengthen career pathways is to have well-defined pathways with short-term certificated linked.

Micro-credentials are an avenue that colleges and systems are researching as possible opportunities to meet workforce needs. The State University of New York (SUNY) system

convened a micro-credentialing task force to develop a process and procedure to offer micro-credentials that would meet business and industry expectations and market demand, provide marketable skills, be stackable, and be short-term in nature. For SUNY, the micro-credential could be issued once a skill was mastered in either a credit or non-credit manner, and the award could take the form of a badge or actual award. The report, published in 2018, also highlighted the positive aspects of issuing micro-credentials such as establishing new industry partnerships or strengthening existing partnerships, motivating students to complete their long-term career and academic goals by awarding shorter credentials, and bridging the gap between credit and non-credit courses and programs.

In *A Strategic Reset: Micro-credentials for Higher Education Leaders,* McGreal and Olcott (2022) provide a look at the micro-credential landscape in America and globally. While directed specifically at universities, not community or technical colleges, the definitions and information are relevant for either. First, they define a micro-credential as certification provided for learning achievement, short-term in nature, and skill based. Micro-credentials allow for the "unbundling" of longer degree programs, thus allowing for employability faster. Concerns noted in the article stressed the lack of understanding what micro-credentials are, that the interpretation of a micro-credential can vary from institution to institution, and that there is a lack of data demonstrating market need.

Apprenticeship

Another avenue that community and technical colleges take to meet workforce needs is through registered apprenticeship programs.

As established in other articles, technical and community colleges are well situated to provide workforce training, and in fact, it has historically been part of the mission of these colleges. Apprenticeship programs are one method through which to do so. Apprenticeship programs provide on-the-job training with related academic course work. These programs require partnerships between industry, colleges, and in some states, collaboration with workforce boards. To better understand how partnerships are developed between business and industry for the purpose of apprenticeship programs, Education Commission of the States (ECS) surveyed apprenticeship program managers in three states: Indiana, Ohio, and South Carolina. Anderson and Keily (2021) reported that each of the states require a varying range of participation from stakeholders that include employers, state agencies, United States Department of Labor (USDOL), and colleges. Regarding the need to fill highly skilled and in-demand jobs, research from both Jacobs and Worth (2018) and Carnevale et al., (2020) were cited. For apprenticeship programs to be successful, Anderson and Keily (2021) supports the need for stakeholder engagement and collaboration. In addition, they suggest that state legislative bodies should also be included to encourage financial support of these workforce critical programs.

Conclusion

It is clear that workforce development continues to be a priority for technical and community colleges. This year, for example, in the 2021-22, Joint Legislative Agenda for the 117th congress: Advancing America's Community Colleges, Association of Community College

Trustees (ACCT) and the American Association of Community Colleges (AACC), workforce development and the advancement of CTE are addressed.

While one can assume that colleges and systems evaluate their academic programs for relevancy and to gauge whether or not workforce needs are being met, additional research and models of program review are needed. Resources for technical education and educators exist and can provide opportunities for these models and research to be shared. As the names suggest, the American Association of Technical Education (ATEA) and the Association for Technical Education (ATE) both support technical education. The Association for Community Colleges (AACC), the League for Innovation, and the National Institute for Organizational Development (NISOD) are three organizations that support both technical and community colleges. Both provide opportunities for presentations and publication. Additional publication focusing on examples of program are needed to provide guidance for higher education professionals seeking to align their college's academic programs with workforce needs. Also important to consider are accrediting organization requirements governing significant change in academic programs, commonly referred to as substantive change. For example, the Southern Association of Colleges and Schools Commission on Colleges has a detailed substantive change policy with strict reporting processes and timelines (2022). Another source is the U.S. Department of Education (2022), which provides other accrediting body requirements.

While this dissertation is focused on aligning academic programs to workforce needs at technical and community colleges, universities also provide a trained workforce. Focus on articulation between technical and community colleges and their four-year counterpart is needed. Additional research is needed that include Guided Pathways and stackable credentials

in relation to meeting workforce needs. And finally, Jacobs et al. (2019), recommend that the review of, and determination of what academic programs should be offered to meet workforce needs should be a holistic approach, with participation from many parts of the college.

CHAPTER THREE: CONCEPTUAL DESIGN OF THE GUIDE

Introduction

This chapter describes the background and process that contributed to the development of *Program Review: A Practical Guide for Technical and Community Colleges* contained in the following chapter. Program Reviews are designed to be comprehensive evaluations of a state or institution's academic programs, ensuring that the alignment of academic programs meet the needs of a state or region's workforce.

Background and Process for Developing the Guide

The content of the Guide represents suggestions, lessons learned, and best practices identified through the experience of the writer who researched, planned, and implemented a program review process at a technical college. In addition, an example review is included to provide illustrate the process.

In September 2019, the Technical College System of Georgia (TCSG) initiated the process of program review aimed at better aligning academic programs with state workforce needs. The TCSG system includes 22 colleges with the mission to build a well-educated, globally competitive workforce through technical education, adult education, and customized training for Georgia's business and industries (TCSG, 2021). In fact, the system provides a "warranty" to students and employers as defined in the Official TCSG Policy Manual (TCSG, 2022). The author,

a system-level professional, was assigned leadership of this project by the agency deputy commissioner and commissioner.

When the process was first initiated, the system's Presidents' Council was notified of the upcoming review. The first step in this process was to identify key participants. Participants included college faculty, department chairs, deans, representation from vice presidents of academic affairs, and presidents. Business and industry representation was sought, and statewide meetings were scheduled. This process is the foundation of the Guide presented in Chapter Four.

Goals of the Guide

The intent of creating the Guide is to assist community colleges with the development of a comprehensive program review process aimed at better aligning academic programs with state workforce needs. It is designed as a framework that can be used by professionals at technical and community colleges to determine the efficacy of academic programs in meeting workforce needs.

As mentioned in Chapter One and supported by Weikel-Delaplane and Arellano (2021), community colleges have struggled with assessing the efficacy of workforce education programs resulting in few examples of effective program review processes and procedures. This Guide seeks to bring together detailed advice and best practices so that others who do this work can benefit from the author's research and experiences. Review components, such as the review of program data and the process for soliciting feedback from business and industry, are

similar to those found in other review models; however, this Guide provides additional elaboration on effective methods and approaches.

Delimitations and Assumptions of the Guide

This product dissertation provides a systematic approach to the implementation of a formal program review process at a community or technical college. During the Guide planning stage, the author had to make several decisions regarding the Guide's contents. The following outlines the various assumptions and delimitations that were made in writing the guide.

Delimitations

The product was designed specifically for community and technical college faculty and staff; thus, consideration has not been given to traditional transfer programs at either the community college or four-year college/university. While community colleges and some technical colleges do have a transfer mission, providing workforce training is a key piece of their mission. Therefore, the focus of this Guide is to provide a framework through which to measure the efficacy of academic programs developed to provide workforce training.

The product does not provide a student perspective of the alignment of academic programs to workforce needs; thus, it does not provide the opportunity to hear from students about their career goals or their employment career paths. The focus of the Guide, then, is centered on the administrative goal of meeting workforce demands and the alignment of academic programs to those demands.

The product does not address the financial aspect of making needed changes to academic programs; thus, colleges or systems needing to measure investment and ROI will wish

to include those measures in their program review process. Examples of financial considerations include the need for both increased and decreased financial obligations. Increased financial obligations include the cost of hiring new faculty and staff, purchasing essential equipment, and developing appropriate instructional space. Decreased financial obligations include the elimination of program faculty and staff, equipment, and space when these are no longer needed.

Assumptions

Several key assumptions were also foundational to the development of this Guide. First, faculty and staff engagement are critical to the successful implementation of a program review process. Faculty teach the classes and ensure that program outcomes are met. They are the individuals who will make curricular changes. In addition, they meet with program advisory committees and should therefore be aware of local workforce needs. Therefore, it is important that they be included in the process.

Second, committed and supportive leadership and administration is necessary to sustain and expand a successful program review process. Support is needed from senior leadership, including the president, provost, the vice president of workforce, chief financial officer (CFO), and the chief information officer (CIO). Communication from the president indicating support as well as the importance of regular, systematic program reviews are needed to convey the significance of the project. The president, provost, and vice president of workforce interact with business and industry and should be either directly involved or kept informed throughout the process to ensure everyone is on the “same page.” Keeping the CFO apprised of the process will

be crucial should recommended changes require additional funds to develop and implement new programming or should the elimination of a program be recommended. Involvement and support of the CIO will allow for access to needed institutional data and reports.

Third, sufficient resources must be available to support program development and implementation. If changes to a program are recommended, these changes will invariably require curriculum revision, a process which could require funds to pay for faculty time or pay for consultation. Funds for possible professional development and new equipment might also be required.

Fourth, institutional research resources must also be available to provide pre-implementation data for planning purposes and outcome data for program evaluation and continuous improvement. One of the key steps of an effective program review process is the collection and review of program data to include enrollment, graduation rates, and job placement numbers.

Guide Structure

The Guide (Chapter Four) is intended to serve as an instrument to assist community college faculty, staff, and administration build a successful program review process. It is not an all-inclusive tool but rather a resource for college employees who are challenged with leading a program review process. The Guide is divided into six Chapters:

- Chapter 1: Purpose and Planning provides guidance for a system or college, through a review of academic programs, to provide to develop a skilled workforce.
    - Curriculum “bloat” and “drift” are defined and implications for program review are discussed.

- Table 1 lists the benefits of a program review for students, institutions, and industry.

- Definitions of common academic and program terminology is provided.

- Chapter 2: Purpose and Process outlines process steps, as well as needed administrative backing, collaboration with workforce, and support from faculty.

    - A framework of seven steps to guide a college through a program review process is provided.

    - The need for support of administration, faculty, as well as business and industry is discussed.

    - Suggested individuals to include in the review process is included.

- Chapter 3: Research and Planning recommends what data to gather, and which sources may be the best sources of this data.

    - Table 2 provides suggested data elements and data points.

    - Workforce data resources are provided.

    - A quadrant measuring academic program needs versus workforce needs is provided as an example of one state's effort to guide academic programs in order to meet workforce needs.

- Chapter 4: College Engagement discusses the need for college involvement.

    - The importance of faculty involvement is discussed, including consideration to transfer articulation and the involvement of accrediting agencies.

    - A map listing national accrediting bodies is provided.

- Chapter 5: Business and Industry Input reiterates the need for business and industry input in the review of curriculum to ensure relevancy in meeting workforce needs.

    - Three methods for gathering workforce data are provided that include program advisory board meetings, surveys, and face-to-face meetings.

    - Four components of information to be reviewed are also included, including outcomes, courses, program length, and general education courses.

- Chapter 6: Approval and Implementation of Changes describes an approval process and considerations for implementation.

- A sample list of system and college personnel involved in the approval process is provided for consideration.
- The importance of communicating curricular changes and the college units to be included in the process are discussed.

Conclusion

The structure and design of the Guide provides a systematic approach that follows the logical steps a community college could take when considering implementation of a program review. The Guide includes the critical elements to consider from the research and planning stage through marketing and public relations. The practical suggestions are not intended to be comprehensive, but to provide guidance and an implementation framework based on research, best practices, and advice learned through experience.

CHAPTER FOUR: THE GUIDE

Introduction to the Guide

This chapter provides the entire Guide, *Program Review: A Practical Guide for Technical and Community Colleges.*

PROGRAM REVIEW: A PRACTICAL GUIDE FOR TECHNICAL AND COMMUNITY COLLEGES

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PREFACE

Over the past 19 years, I have had the benefit of working in 3 different states, at 3 different institutions: Chattanooga State Community College is part of the Tennessee Board of Regents (TBR) system, and is the only community college in the state with a Tennessee College of Applied Technology (TCAT) associated with the institution; Ivy Tech is the largest singly accredited, and statewide comprehensive community college of Indiana; the Technical College System of Georgia (TCSG) is comprised of 22 technical colleges across the state of Georgia.

At each of these, the review of completion rates and data have been a part of my job. In my current systems role, I have been responsible for the comprehensive review of all statewide standard programs. This has included interacting with college faculty, staff, and administrators as well as business and industry representatives. Our charge has been to review existing programs and ensuring the alignment with business and industry needs.

This guide is designed for those interested in conducting a comprehensive program review. Throughout the guide, you will find helpful information and resources both from my own experience implementing a program review, and from the Tennessee Board of Regents and Ivy Tech Community College, with whom two of my committee members are employed.

ACKNOWLEDGEMENTS

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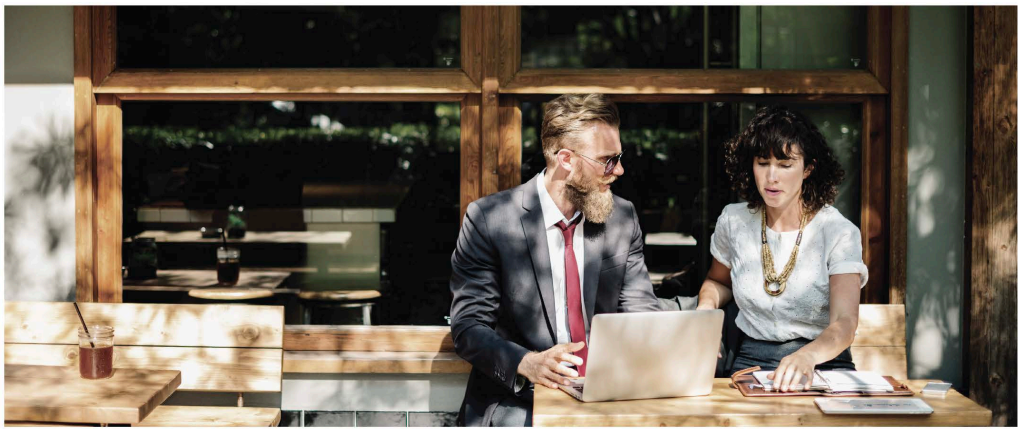
CHAPTER 1: PURPOSE AND PLANNING

INTRODUCTION

Workforce Program Review processes are designed to be comprehensive evaluations of a state or institution's academic programs with the goal of ensuring that academic programs are aligned with the needs of a state or region's workforce. In a search of processes used by state systems of higher education, you will find numerous examples of program audits. While these provide a review and assessment of academic programs, they typically do not include a comprehensive review of curriculum aligned to workforce needs.



Conducting a comprehensive program review process for workforce programming provides an institution with a valuable opportunity to discover and eliminate curriculum "drift" when workforce changes occur that require new skills and technology and to identify curriculum "bloat," which occurs over time when a curriculum an established curriculum continues to add courses and outcomes, retaining everything without trimming or eliminating outdated elements (Andersen, M.H. via Downs, L.R., 2020). The literature further defines curriculum drift as a process in which the learning experiences and content do not match specific desired learning outcomes (Woods, 2015, pp. 641-644), such as content and activities that have no relevance for students who need to master skills needed for employment. Curriculum bloat most often occurs when additional courses are added to address new market needs or changing workforce skills. In both instances, program length can be

impacted, prolonging students' completion and eventual employment. Students, institutions, and industry can benefit from a comprehensive program review process. Some of these benefits are listed in Table 1.

TABLE 1: Benefits of Program Review

STUDENTS	INSTITUTIONAL	INDUSTRY
• Accelerates Completion • Focus on Skills • Ready for Employment	• ROI • Alignment with Institutional Mission	• Highly Skilled Employees • Appropriate Training and Certification • Upskilling of Current Employees

DEFINITIONS

Throughout this document, the following terms are used:

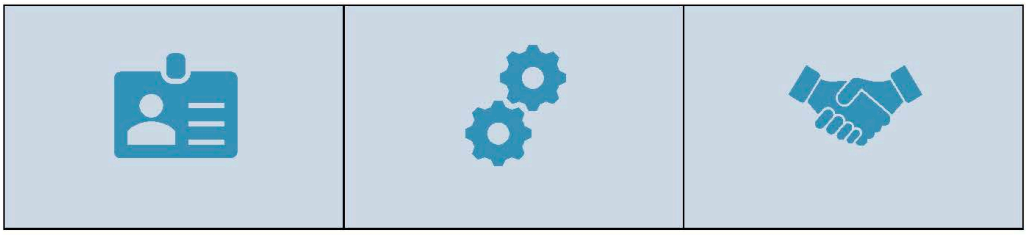
- **Accreditation**: The process used to ensure that institutions of higher education provide standards of quality and integrity (U.S. Department of Education, 2020).
- **Accrediting Agencies**: Organizations/Associations comprised of institutions established to enforce academic standards (U.S. Department of Education, 2020).
- **Associate of Applied Science Degree**: Programs comprised of both general education and career courses. Offered for students who wish to enter the workforce upon graduation (TCSG State Board Manual, 2020).
- **Associate of Science Degree**: Programs comprised of both general education and career courses. Offered for students to enter the workforce or continue their education at the baccalaureate level (TCSG State Board Manual, 2020).
- **Certificate**: Specific set of competencies that match a field of work, most often for specializations that require fewer courses and credit hours than either a diploma or degree (TCSG State Board Manual, 2020).
- **Course Competencies**: Identified skills and tasks required within a course.
- **Credit Hours**: "An amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally established equivalency." (U.S. Department of Education, October 29, 2010, Final Regulations).
- **Curriculum:** Courses offered within a program of study.

- **Diploma**: Programs of shorter length than degree but require more courses and training than certificate programs (TCSG, State Board Policy Manual, 2020).
- **Program Outcomes:** Intended goals of a program (the Glossary of Education Reform, 2013).
- **Substantive Change**: A significant modification of the nature and scope of a program (SACSCOC Substantive Change Policy Statement, 2019).
- **Workforce:** The number of potential workers for a specific enterprise (Merriam-Webster, 2020).
- **Workforce Certification:** A credential issued upon completion of a course of training, often requiring standardized industry assessment.

SUMMARY

Conducting a comprehensive program review provides an opportunity for input, program clarity, ridding a program of unnecessary content, examines teaching methodology, examine enrollment, completion, job placement rates, and ROI. All of these are critical to providing a skilled workforce for your state and/or service area.

CHAPTER 2: PURPOSE AND PROCESS



PROGRAM REVIEW PURPOSE

If you are a community or technical college leader charged with providing programs and services to meet workforce needs in your service area, you understand the importance of having academic programs aligned to these needs. To meet current workforce requirements and to help prepare for future U.S. labor market needs, community colleges will need to assess their academic program offerings to ensure that they are, and remain, aligned to the changing workforce needs. This Guide is developed to assist with the review of your college programs through which to assure program relevancy and efficacy. These three questions should guide your program review process:

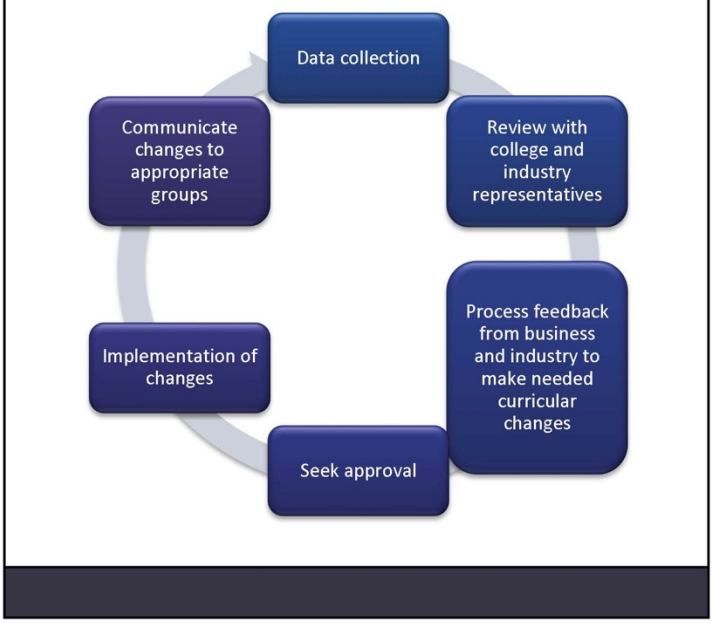
1. What are the critical needs of workforce and how can your institution meet them?
2. By examining current academic programs, how can your college gain helpful feedback to ensure that its programs are aligned to current and future workforce needs?
3. How have different instructional methods impacted learning and preparing skilled students for the workforce?

THE PROCESS

Steps in the process:

1. To prepare for joint meetings with business and industry representatives, you will need to collect data and program information. This information should include the following:
   - Program curriculum to include learning outcomes
   - Number of credit and contact hours
   - Enrollment numbers
   - Number of credentials awarded
   - Job placement numbers and percentages
   - Regional or state workforce data: number of current or projected job openings with job titles.

FIGURE 1: Review Process



2. Include business and industry in this process – after all, these are the people hiring your students and, in many cases, support your programs with dollars and equipment. After you collect the suggested data and information in #1, schedule a meeting, or meetings, with industry representatives, program faculty, and administrators (deans or vice presidents of workforce development or academic affairs). During the meeting, review the data and program information gathered. This meeting should allow for dialogue between the college faculty and staff and business and industry representatives. Make sure to document discussion points and feedback.

3. After the meeting, internally process feedback from business and industry with college faculty and administration (or at a system level). This review should include a chancellor, provost, and workforce vice president. Based on feedback received and the evaluation of data, identify program changes, program deletions, or program additions. During this step, you will begin to consider the costs involved. For example, if industry has indicated, and data supports, the need for skilled hybrid auto mechanics, you need to determine if you have the necessary equipment

and credentialed faculty to offer such a program. You can't offer a program without both. What are the costs associated with acquiring these?

4. Once a decision has been made regarding any needed changes or updates, you must follow either your college or system policy or guidelines governing program changes. An example would be presenting updated or new curriculum to a college curriculum committee. At a system level, this might also include obtaining the approval of a statewide committee of presidents or academic officers, or the approval of a board of trustees.

5. After the program change process has been completed, the job isn't finished. Now you must implement changes across the operational systems, including
   - Updating any affected databases
   - Updating your Student Information System (SIS)
   - Updating advising and admission material
   - Submitting appropriate documentation to national accrediting agencies.

6. And, of course, throughout the process you must also communicate these changes to all appropriate groups:
   - Colleges within the system (if the review is conducted at the system level)
   - Faculty and staff
   - Students

SUPPORT

For a Program Review process to be successful, it is critical that support for this endeavor to exist at all levels. For a system, that will include the system head (chancellor, commissioner, president) as well as the people providing oversight to both academic and student affairs, finance, and workforce development. In addition, the support of college leadership is vital.

Why do you need support? A memorandum from either a system or college head conveys to faculty and staff that the program review is not capricious and is needed to ensure that workforce needs are being met through training at their college.

The support of senior leadership is also critical when considering political influence. An example: If your review indicates that there are no jobs for workers in a particular location, you might

recommend terminating that program at that specific location. However, local influences may also dictate that you continue offering that program.

REVIEW LEADERS

It is important to have the right people involved in the process. For either a college or system review, faculty must be involved as they "own" and teach the curriculum as well as work directly with students.

If this review is being conducted at a state level, representatives from each college should be included in the process because the programs are taught at the colleges, not in the system office.

Changes to programs could have a financial impact as well, for example, requiring new equipment and faculty needs. Or, if a program is being recommended for termination, the college will be responsible for handling faculty terminations as well as notifying accreditation agencies such as the Higher Learning Commission (HLC).

Step two in the process involves bringing both college/system faculty and staff together with industry representatives to review the programs. At TCSG, this collaborative group included:

1. TCSG System Office:
   - Senior Executive Director of Academic Affairs
   - Curriculum Program Specialist
2. One college president
3. At least one vice president of Academic Affairs
4. Program chairs and/or faculty from each college that offered the program under review
5. Dean(s) from each college that offered the program under review
6. Representatives from business and industry served by the programs.

SUMMARY

Conducting a program review should be a collaborative process. The collaboration should include representatives from business and industry as these are the people who know what jobs need to be filled, and know the necessary skills required of those workers. The faculty who teach the program

courses and the college administrators who provide program oversight, including hiring and ensuring that that the program has adequate funds, must also be involved from the very beginning.

CHAPTER 3: RESEARCH AND PLANNING

INTRODUCTION

Prior to beginning a comprehensive program review, the person tasked with conducting the review should work with your college or system's Information Technology Data Research (ITDR) team to collect program data. Information should include enrollment, completion, and placement data. This information will be used to set a base line through which changes can be measured. This will also provide a gauge through which to measure future changes.

PRE-IMPLEMENTATION DATA

Program Enrollment and Completion

At an institutional or system level, you will need to gather the needed data with the assistance of your Institutional Research office. If you reside and work in a state with a system structure, you can obtain the necessary information provided either as collective or by-institution data with the help of the Institutional Research division. Table 2 presents suggested categories and types of data you will need:

- Current and historical enrollment data by college.
- Completion rates
- Placement rates
- ROI if available

TABLE 2: Data and Information to Collect

Elements	Data and Process
Program	• Enrollment • Credentials Awarded • Placement Numbers • Program Costs • ROI (if available)
Workforce Needs	• Number of Jobs • Pay ranges • Required Skills and Abilities
Mission Statement	Review to ensure alignment between program and institutional mission and vision
Policies and Guidelines	Identify the range of expected or required credit hours for the planned certificate or degree program

Labor Market

In order to meet workforce needs, you must first know what those needs are. There are several key questions to ask and areas to investigate: What is the need and demand for higher education and job training in your area? Do the two overlap? Does your college and existing programming currently meet the needed demand? Does your state collect data and publish a list of high-demand careers? Are these identified careers matched to your existing program offerings?

Many states and/or higher education systems prepare and publish annual descriptions of workforce needs and projections. The College System of Tennessee, for example, published a report (2018) describing employment needs based on required educational attainment levels and current unemployment rates linked to a geographic distribution of related higher education programs (https://www.tbr.edu/sites/default/files/media/2018/12/Tennessee%20Education%20%26%20Workforce%20Maps_User%20Guide.pdf). This report also includes includes demographic and labor market data and workforce maps.

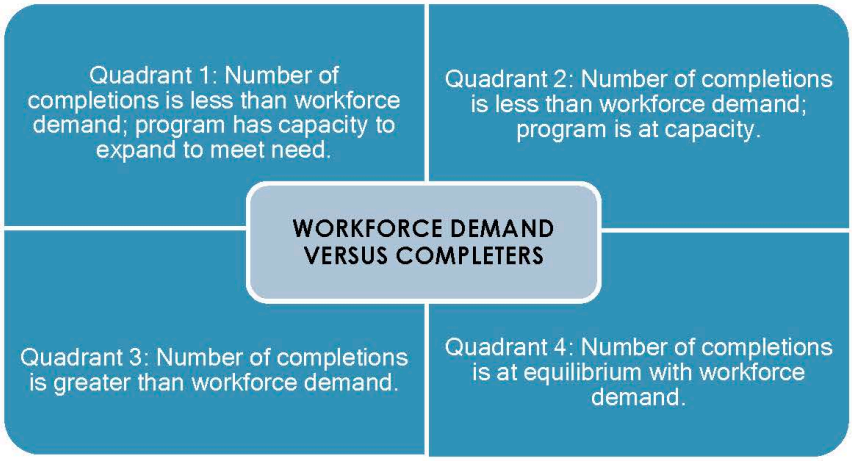
As is demonstrated clearly by this report, when considering factors relating to demand, consideration should be given to regional need. Not all areas of a state or even service area may have the same need for workers or for specific programming.

In Indiana, the Department of Workforce Development provides a website that provides detailed job needs (https://www.in.gov/dwd/). Colleges and universities in Indiana then use this information to determine program needs based on projected workforce changes.

Another key source of information is labor market data for both national and local areas. There are multiple sources of this data. First, national data can be found by accessing the U.S. Department of Labor website (https://www.dol.gov/). Secondly, you can access state and regional data through your state agency. For example, the Georgia Department of Labor collects, analyzes, and publishes current information about the economy, job market, and needs (https://dol.georgia.gov/get-labor-market-information). In addition to overall labor market information, Georgia's website provides local analysis. Look for similar sources in your area.

Figure 2 provides an example of how a community college (in this case, the Ivy Tech Community College system) uses workforce projections to determine program needs. Ivy Tech developed this 4-quadrant system for its data collection process to identify levels of program needs.

Figure 2: Workforce Data and Information to Collect



SUMMARY

Before beginning the program review process, it is important to gather information and data relevant to the review. This information should include current labor market trends and, if possible, projections of future workforce needs. It is also important to collect and review current program data including enrollment, graduation, and placement trends.

CHAPTER 4: COLLEGE ENGAGEMENT

INTRODUCTION

The Program Review process affects an institution's current and future directions; thus, the process needs to include input from across the institution, from program admissions officers to faculty and administrators.

As previously mentioned, faculty "own" the curriculum: they provide curricular updates and determine the teaching modality, such as hybrid, online, clinic-based, lab-supported, face-to-face, or asynchronous. Therefore, they must actively participate in the Program Review process from the very beginning.

As an example of college engagement, at TCSG face-to-face meetings were held to "kick-off" the review process. Faculty from each college that offered the program being reviewed were invited, as well as business and industry representatives. Many of these representatives also serve on program advisory boards at colleges across the state and know the programs and the curricula well.

Notes:

- The importance of including business and industry representatives is discussed in more detail in the next chapter.
- A sample agenda for the kick-off meetings can be found in the appendices.

If you are conducting a statewide (system level) curriculum review, you must also have college engagement during a statewide review of curriculum. Why? Because the colleges are the entities teaching and providing the trained work force, not the system office!

Many of the people involved in a college level review should also be included in a system level review. System level program reviews include many of the same processes and people, just on a much broader scale. Also consider who has the final vote on curricular changes. Make sure that this person or group understands the purpose of the review and any impact that program changes might bring to their college(s). You don't want to go through an entire review process only to encounter naysayers at the end of the process.

SUMMARY

It is always a good idea to garner support for a program review upfront and in the beginning of a process to ensure that whatever changes that need to be made at the backend will not be blocked by someone who wasn't on board in the beginning. And, whether you are conducting a college or system level review, include faculty from the onset. Involving key stakeholders from all areas and all levels must be intentional, well planned, and well documented.

CHAPTER 5: BUSINESS & INDUSTRY INPUT

If a college's goal is to serve the local community and provide a skilled workforce for local business and industry, then the importance of a good relationship with representatives from across community is essential to the health and well being of the college.

When conducting a Program Review process, one key element is an effective process for soliciting feedback from business and industry to ensure that the programs your college is offering meet the needs of business and industry.

You can gather effective information through various avenues:

Advisory Boards

Collect feedback during program advisory board meetings. Community and technical colleges rely on their program advisory committees. These meetings occur at least annually, if not bi-annually. Use the time during at least one of these meetings to share workforce data, program

data and information, and to solicit direct feedback from the business and industry representatives present regarding workforce needs.

Market-based Surveys

Solicit feedback by using quick data-collection surveys in the specific market. This can be done using a digital product such as Qualtrics or SurveyMonkey. If using this method, develop and pre-test your questions first, making sure that you'll gather the data you need. Then, using existing contact information obtained through your college's workforce development department as well as your program advisory council lists, email the survey with a personalized message to your area's business and industry leaders. Your message must reinforce the importance of their input to keep your programming up to date and viable.

Town-and-Gown Meetings

As previously discussed, meetings between business and industry representatives (*town*) and college faculty and administrators (*gown*) are essential for all workforce programs and are especially important during the Program Review process.

During regular sessions, having the groups collaboratively review curriculum helps keep the academic outcomes based on realistic workplace needs and keeps the communication doors open as needs change.

During the Program Review process, though, more specific information should be reviewed and gathered during these meetings:

- Program Outcomes: Do the skills being taught in the academic programs meet what is currently needed in the workforce? Does the training stand up to workforce warranties (such as the TCSG example provided earlier)? Are there redundancies or outdated outcomes that should be removed? Is there an outcome or outcomes that should be added to the program?
- Program courses: Because program outcomes are taught through program courses, the courses themselves must also be reviewed. This review should cover key factors, including how much time is needed in lecture and lab (or other modalities) to master the essential competencies; how much time should be dedicated to "hands on" learning; and how well are the assessment and evaluation components measuring student learning?
- Type and Length of Program: Once the program outcomes, course outcomes, and course modality and structures have been reviewed, these should be examined in

terms of depth and breadth of coverage; thus, the review should include an assessment of program level (certificate, associate degree) and length.

- Institutional Requirements by Type: A final component of the discussion with industry and business representatives is the role and function of non-program requirements, such as the institution's General Education courses. What level of skills in the foundational courses — mathematics, writing, communication — is needed in the workplace? Which courses and which levels of abilities need to be included in the program?

SUMMARY

Including business and industry in the Program Review process ensures that academic programs contain the needed content required for the current job market. In addition, if your college or system provides a warranty (similar to TCSG's) that verifies that graduates possess the needed skill to proficiently do the work for which they are hired, it is critical that your programs align properly.

TCSG's warranty (https://www.tcsg.edu/tcsgpolicy/files/5.1.7.pdf) states, in part:

> As a demonstration of our confidence in the quality of our technical college programs, the Technical College System of Georgia [TCSG] warrants every graduate of our technical college programs offering a technical certificate of credit, diploma, or associate degree as follows:
>
> The warranty guarantees that the graduate has demonstrated the knowledge and skills and can perform each competency as identified in the industry-validated Standard or Program Guide. Any program graduate who is determined to lack such competence shall be retrained at no cost to the employer or the graduate for tuition or instructional fees.

CHAPTER 6: APPROVAL & IMPLEMENTATION OF CHANGES

APPROVAL PROCESS

As the Program Review process unfolds, you will begin to see areas where change is needed. Those changes can be minimal, such as editing existing outcomes with no change to credit or contact hours. Other changes, however, may be more significant, such as changing contact or credit hours or even recommending the elimination of a program.

Once the review process has been completed and curricular changes have been recommended, these changes are then moved through an approval process. The approval process will vary dependent upon the scope, college- or system-level review requirements.

For example, at the Technical System of Georgia, once curricular changes are recommended, the changes are reviewed and voted upon by the President's Council. Those programs approved by the President's Council are next reviewed and voted upon by the State Board of Trustees.

As you move your approvals through normal channels, the process would involve some, if not all, of the following steps:

1. College or statewide curriculum committees.
2. Level approvals
   - At the local college level, approval by the provost and/or president.
   - At a statewide level, approval by a vice presidents' or presidents' council.
3. Institutional approvals, such as Board of Trustees at either a college or system level.
4. Program accrediting bodies, such as the Commission on Accreditation in Physical Therapy Education (CAPTE), for substantive changes or revisions to any program with external accreditation.
5. National higher education accrediting agencies such as the Higher Learning Commission (HLC).

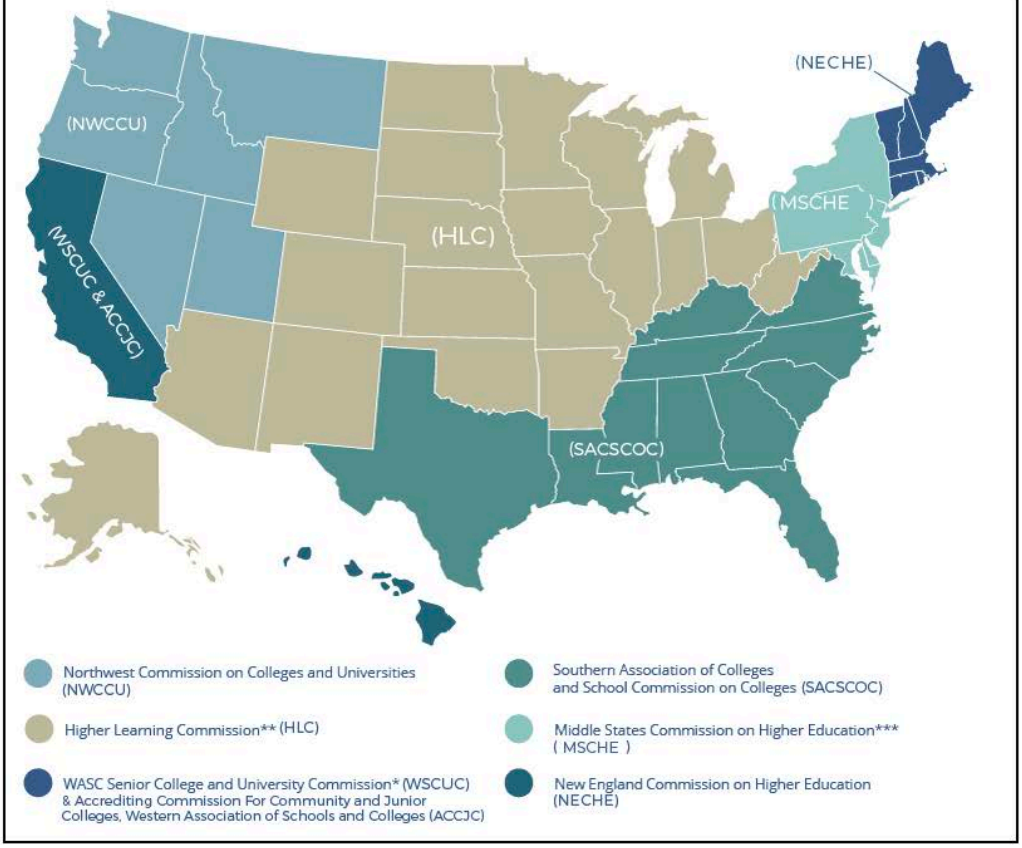
As noted in items #4 and 5 above, accrediting bodies must be informed about any programmatic changes resulting from the Program Review process. While some of these may be "for information

only" notifications, other more significant revisions will require approvals and communication throughout the review process.

Many workforce programs that have national boards and associations have strict processes and requirements for program assessment and evaluation. Be sure to contact these groups early in the Program Review process to determine the timeline for approvals and final acceptance of any changes.

Regional accrediting bodies (see Figure 3) that provide accreditation to colleges must also be informed of any curricular revisions. These 6 educational "commissions" are responsible for ensuring quality standards within and across U.S. higher education institutions.

Figure 3: U.S. Accreditation Boards



Implementation

The implementation process within a college or system may involve significant operational and programmatic steps, including edits to Student Information Systems (SIS), catalogs, college and system websites, and marketing material.

For the Program Review process to be smooth and efficient, it is recommended that individuals responsible for these edits be involved and informed of the review process as it progresses. If the changes have been significant and impact student completion — such as additional courses, a change in required credit hours, or revisions to lab or clinical requirements — the academic division may also need to develop a "teach out" plan to include a timeline for helping currently enrolled students complete the existing program. Communicating this information to students is critical.

Communication

Providing adequate information to college faculty and staff about the Program Review process from the very beginning will be essential to both the acceptance of the results and the smoothness of the implementation process.

As you develop your Program Review team and identify your review tasks, be sure to identify and include those individuals and offices who interact with students and provide information about your college's academic programs. These offices and functions should be included in the process and will also need updated program information — and agreed-upon messaging — to share with students at its completion. Three key areas include the affected academic units, the advising team from across the college, and those involved in the registration processes.

Foundational to the communication process is the "door" to your institution: the college's website! Make sure that all references to the program — across all areas of your college website — reflect the program changes and provide connections to people who can address student questions or concerns.

SUMMARY

Both colleges and systems have approval processes in place to approve curricular changes. Follow those processes. While this chapter has provided suggestions of components and people who should be involved in the process flow, remember that the first step in curricular change is faculty involvement. Faculty "own" curriculum and are the professionals who will implement the changes and communicate directly with the students.

Of course, students (both current and new) need to know what the changes are and how those changes impact their academic progression — or possibly even their career choice in the case of program elimination. Departments that interact with students and provide academic information also need to be included in the discussion.

Other college staff that will be involved in the implementation of program changes will include the registrar or registrar office staff, those responsible for updating information in your Student Information System (SIS) such as Banner or People Soft, representatives from financial aid, and marketing personnel who will ensure that the college publications and website reflect all program changes.

Communication is key to the successful implementation of curricular changes!

CHAPTER 7: CONCLUSION

From an analysis of Program Review processes reported in the literature, examples from several states, and my personal experience, this Guide provides critical elements and steps that should help you conduct a comprehensive Program Review process.

A well-designed Program Review process includes data, feedback from industry partners, and communication and collaboration among all participants.

- Participants should include representatives from business and industry, as well as state and college level faculty and staff.
- Data should include enrollment, graduation rates, placement numbers – overlapped with current and projected job needs.
- Program information should include program and course outcomes, applicable courses, and credit and contact hours.

Follow your college or system level guidelines and policies that provide direction for curricular change. At a college level, this most likely includes getting the approval of a curriculum committee, provost, and/or college president. At a system level, this could include approval from a statewide provost or president's council as well as the system head such as a chancellor. At either a college or system level, there might also be a need for Board of Trustees approval as well. Identify the processes and policies that guide your work locally and invite participation and involvement from the very beginning.

An effective, comprehensive Program Review process will lead to a better alignment of your college's programming with workforce needs and will strengthen the partnerships with those businesses and industries within your service area.

Best wishes as you conduct this important work!

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APPENDICES

APPENDIX A: PROGRAM REVIEW KICK-OFF AGENDA

Program Review Meeting

Objective of review process: How might we develop quality programs which meet industry needs while allowing flexibility and shorter time to market?

I. Introductions -All
II. Setting the stage for the review process -Saundra
III. Review of business and industry needs – Business and Industry Representatives
IV. Review of Program Outcomes – CPS, All
    A. Additions
    B. Deletions
V. Working Lunch

VI. Continue Review of Program Outcomes
VII. Courses
VIII. Scheduling
IX. Other...next steps?

Meeting Goal: Reach an agreement about program outcomes, flexible content and delivery.

APPENDIX B: PARALEGAL PROGRAM REVIEW DOCUMENTS

Program Revision Summary

Paralegal Studies Program Revision Summary Points

The Paralegal Studies programs and courses retain similar structure and hours to the current versions. After reviewing industry input, all PARA courses were streamlined to remove redundancy. Terminology was modified to ensure workforce ready graduates. All PARA courses (except internships and practicum) remained at 3 credit hours and 45 contact hours.

Proposed Programs

Degree – Paralegal Studies (69 cr hrs)

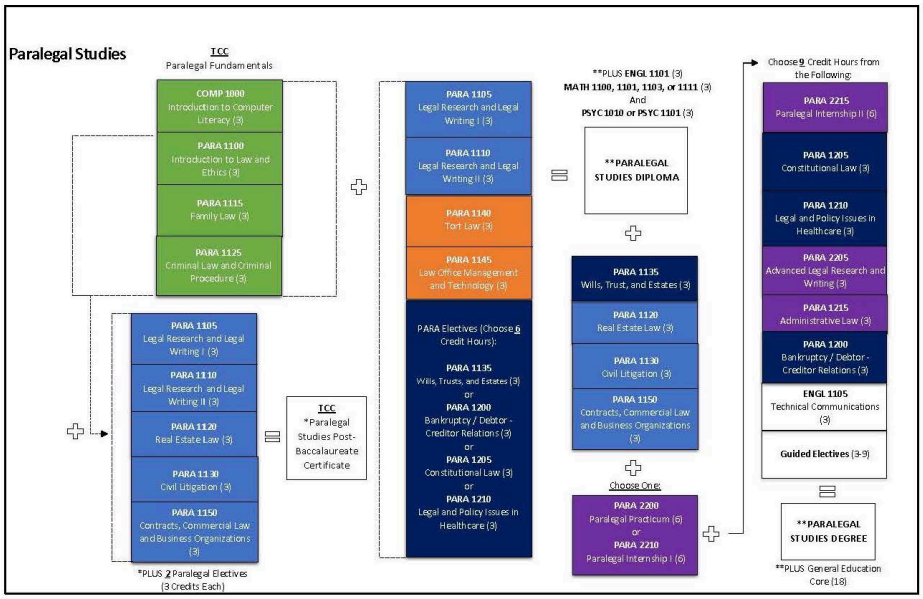
Diploma – Paralegal Studies (39 cr hrs)

TCCs:

- Paralegal Fundamentals (12 cr hrs)
- Paralegal Studies Post-Baccalaureate Certificate TCC (30 cr hrs)*

*The Post-Baccalaureate TCC is for individuals who have previously earned a Bachelor's degree. It's a pathway that is quicker to the workforce than the Associate's Degree, but allows the graduate to be equally prepared.

Program Visual



Proposed Courses and Competencies

Paralegal Studies
Work Group Recommendations

Certificates, Diploma, and Degree

Paralegal Fundamentals TCC (12 Credits / 13 Contact Hrs)

COMP	1000	Introduction to Computer Literacy
PARA	1100	Introduction to Law and Ethics
PARA	1115	Family Law
PARA	1125	Criminal Law and Criminal Procedure

Paralegal Studies Post-Baccalaureate Certificate TCC (30 Credits / 30 Contact Hrs)

PARA	1100	Introduction to Law and Ethics
PARA	1105	Legal Research and Legal Writing I
PARA	1110	Legal Research and Legal Writing II
PARA	1115	Family Law
PARA	1120	Real Estate Law
PARA	1125	Criminal Law and Criminal Procedure
PARA	1130	Civil Litigation
PARA	1150	Contracts, Commercial Law and Business Organizations
PARA	XXXX	PARA Elective
PARA	XXXX	PARA Elective

Paralegal Studies Diploma (39 Credits / 40 Contact Hrs)

ENGL	1101	Composition and Rhetoric
PSYC	1010	Basic Psychology Or PSYC 1101
MATH	1100	Quantitative Skills and Reasoning Or MATH 1101, 1103, or 1111
COMP	1000	Introduction to Computer Literacy
PARA	1100	Introduction to Law and Ethics
PARA	1105	Legal Research and Legal Writing I
PARA	1110	Legal Research and Legal Writing II
PARA	1115	Family Law
PARA	1125	Criminal Law and Criminal Procedure
PARA	1140	Tort Law
PARA	1145	Law Office Management and Technology

PARA Electives: Choose 6 credit hours from the following:

PARA	1135	Wills, Trusts, and Estates
PARA	1200	Bankruptcy / Debtor – Creditor Relations
PARA	1205	Constitutional Law
PARA	1210	Legal and Policy Issues in Healthcare

Paralegal Studies Degree (69 Credits / 82-94 Contact Hrs)

COMP	1000	Introduction to Computer Literacy
PARA	1100	Introduction to Law and Ethics
PARA	1105	Legal Research and Legal Writing I

PARA	1110	Legal Research and Legal Writing II
PARA	1115	Family Law
PARA	1120	Real Estate Law
PARA	1125	Criminal Law and Criminal Procedure
PARA	1130	Civil Litigation
PARA	1135	Wills, Trusts, and Estates
PARA	1140	Tort Law
PARA	1145	Law Office Management and Technology
PARA	1150	Contracts, Commercial Law and Business Organizations
Choose one:		
PARA	2200	Paralegal Practicum
PARA	2210	Paralegal Internship I
Electives: Choose 9 credit hours from the following:		
PARA	1200	Bankruptcy / Debtor – Creditor Relations
PARA	1205	Constitutional Law
PARA	1210	Legal and Policy Issues in Healthcare
PARA	1215	Administrative Law
PARA	2205	Advanced Legal Research and Writing
PARA	2215	Paralegal Internship II
ENGL	1105	Technical Communications
XXXX	xxxx	Guided Electives (3 to 9 hours)
General Education:		
ENGL	1101	Composition and Rhetoric
SPCH	1101	Public Speaking
AREA II	xxxx	Social/Behavioral Sciences Elective
MATH	11xx	1100, 1101, 1103 or 1111
AREA IV	xxxx	Humanities/Fine Arts Elective
GEN ED	xxxx	Program-Specific General Core Elective

Curriculum Content

PARA 1100 Introduction to Law and Ethics

3 credit hours (3 lecture, 0 lab = 3 contact hours)

American Legal System Survey

1. Describe the structure of the American legal system.
2. Identify and explain the four primary sources of law.
3. Describe the structure of federal and state court systems.
4. Describe the difference between civil and criminal law.
5. Describe the differences between substantive and procedural law.
6. Define jurisdiction and differentiate between the various types of jurisdiction.
7. Describe the litigation process.
8. Describe the alternative methods of dispute resolution

Code of Professional Responsibility and Ethics Overview

1. Review and discuss the ABA Code of Professional Responsibility and the Georgia Code of Profession Responsibility.

2. Recognize ethical issues in the practice of the law and apply the appropriate rules of professional responsibility.
3. Describe the role of the lawyer and the paralegal in the American legal system.

Legal Reasoning and Problem Solving
1. Analyze statutes and cases.
2. Identify specialty areas of law.

Introduction to Areas of Law and Legal Vocabulary
1. Define legal concepts and terminology commonly used in American law.

PARA 1105 Legal Research and Legal Writing I
3 credit hours (3 lecture, 0 lab = 3 contact hours)

Identification of Search Terms and Legal Issues
1. Generate search terms to use in research.
2. Identify legal issues related to a particular set of facts.

Sources of State and Federal Statutes and Case Law
1. Read legal sources critically and accurately to identify relevant information.
2. Determine the applicable federal or state law and sources of the law for a research task.
3. Locate both federal and state primary and secondary sources.
4. Determine jurisdiction and venue and differentiate between the various types of jurisdiction.

Citation of Legal Authorities
1. Use the current edition of The Blue Book and the ALWD Citation Manual to correctly site sources.
2. Update research using a citator.

Research, Analysis and Writing
1. Analyze the research task and its purpose, considering the weight and hierarchy of authorities within the American legal system.
2. Define non-legal research and whether it is needed for the task.
3. Research specific rules utilized in specific courts.
4. Apply law to facts to objectively analyze potential legal consequences.

Writing to Communicate and Strategies for Effective Writing
1. Construct effective written communications using correct grammar and paragraphs.
2. Explain strategies for argumentative, persuasive, objective, and predictive writing.

Legal Correspondence
1. Describe the purpose, audience, and basic formats for legal correspondence.
2. Explain the differences between letters, memoranda, briefs, and the formats for each.

Legal Memoranda and Briefs
1. Describe the components of a memorandum.
2. Describe the difference between a trial brief and an appellate brief.

PARA 1110 Legal Research and Legal Writing II
3 credit hours (3 lecture, 0 lab = 3 contact hours)

Preparation for Legal Research and Writing

1. Interpret a factual situation and determine whether the issues presented are criminal or civil.
2. Identify the central questions or issues and recognize the areas of the law to be addressed.

Developing a Research and Writing Strategy

1. Outline the process of a research assignment and estimate the amount of time needed for completion.
2. Choose legal authority appropriately to build legal arguments.

Research, Analysis and Writing

1. Use computer-assisted legal research to locate primary and secondary sources.
2. Write an office memorandum utilizing a structured analysis of the legal issues related to a particular set of facts.
3. Identify initial and responsive pleadings required for a particular legal action.
4. Identify the discovery documents required for a particular legal action.
5. Predict available remedies and the opposing parties' response to pleading documents and discovery requests.
6. Examine the rules of the appellate court to which the losing party will appeal.
7. Write a persuasive argument.

Legal Correspondence

1. Draft communications to opposing counsel, witnesses, and others related to the case. .
2. Communicate in writing to court personnel regarding necessary matters.

PARA 1115 Family Law
3 credit hours (3 lecture, 0 lab = 3 contact hours)

Issues Associated with Client and Witness Interviews

1. Describe initial intake and interview process
2. Identify legal issues presented by the facts.

Marriage Validity and Dissolution

1. Define the essentials of a valid marriage.
2. Define the grounds for dissolution of marriage.
3. Describe the factors a court or jury may consider when making awards of child custody, child support, alimony, and equitable division of property.
4. Describe basic tax implications of dissolution of marriage.

Litigation Support in Family Law Matters

1. Draft pleadings and assemble other family law-related documents.
2. Describe court jurisdiction over family law matters.

Program Chart

Paralegal Studies Diploma								
Course	**Number**	**Title**	**Total Credit Hours**	Lecture Credit Hours	Lecture Contact Hours	Lab Credit Hours	Lab Contact Hours	**Total Contact Hours Per Week**
COMP	1000	Introduction to Computer Literacy	**3**	2	2	1	2	**4**
PARA	1100	Introduction to Law and Ethics	**3**	3	3	0	0	**3**
PARA	1105	Legal Research and Legal Writing I	**3**	3	3	0	0	**3**
PARA	1110	Legal Research and Legal Writing II	**3**	3	3	0	0	**3**
PARA	1115	Family Law	**3**	3	3	0	0	**3**
PARA	1125	Criminal Law and Criminal Procedure	**3**	3	3	0	0	**3**
PARA	1140	Tort Law	**3**	3	3	0	0	**3**
PARA	1145	Law Office Management and Technology	**3**	3	3	0	0	**3**
PARA Electives: Choose 6 credit hours from the following:								
PARA	1135	Wills, Trusts, and Estates	**3**	3	3	0	0	**3**
PARA	1200	Bankruptcy / Debtor - Creditor Relations	**3**	3	3	0	0	**3**
PARA	1205	Constitutional Law	**3**	3	3	0	0	**3**
PARA	1210	Legal and Policy Issues in Healthcare	**3**	3	3	0	0	**3**
Basic Skills								
ENGL 1101 Composition and Rhetoric			**3**	3	3	0	0	**3**
PSYC 1010 or PSYC 1101			**3**	3	3	0	0	**3**
MATH 1100, 1101, 1103, or 1111			**3**	3	3	0	0	**3**
Total Diploma Hours			**39**	**38**	**38**	**1**	**2**	**40**

Paralegal Fundamentals TCC								
Course	**Number**	**Title**	**Total Credit Hours**	Lecture Credit Hours	Lecture Contact Hours	Lab Credit Hours	Lab Contact Hours	**Total Contact Hours Per Week**
COMP	1000	Introduction to Computer Literacy	**3**	2	2	1	2	**4**
PARA	1100	Introduction to Law and Ethics	**3**	3	3	0	0	**3**
PARA	1115	Family Law	**3**	3	3	0	0	**3**
PARA	1125	Criminal Law and Criminal Procedure	**3**	3	3	0	0	**3**
Total Certificate Hours			**12**	11	11	1	2	**13**

Paralegal Studies Post-Baccalaureate Certificate TCC								
Course	**Number**	**Title**	**Total Credit Hours**	Lecture Credit Hours	Lecture Contact Hours	Lab Credit Hours	Lab Contact Hours	**Total Contact Hours Per Week**
PARA	1100	Introduction to Law and Ethics	**3**	3	3	0	0	**3**
PARA	1105	Legal Research and Legal Writing I	**3**	3	3	0	0	**3**
PARA	1110	Legal Research and Legal Writing II	**3**	3	3	0	0	**3**
PARA	1115	Family Law	**3**	3	3	0	0	**3**
PARA	1120	Real Estate Law	**3**	3	3	0	0	**3**
PARA	1125	Criminal Law and Criminal Procedure	**3**	3	3	0	0	**3**
PARA	1130	Civil Litigation	**3**	3	3	0	0	**3**
PARA	1150	Contracts, Commercial Law and Business Organizations	**3**	3	3	0	0	**3**
PARA	XXXX	Paralegal Elective	**3**	3	3	0	0	**3**
PARA	XXXX	Paralegal Elective	**3**	3	3	0	0	**3**
Total Certificate Hours			**30**	30	30	0	0	**30**

Paralegal Studies Degree								
Course	**Number**	**Title**	**Total Credit**	Lect Hrs	Lect Cont Hr	Lab Cr Hrs	Lab Cont Hrs	**Total Wk Contact Hr**
COMP	1000	Introduction to Computer Literacy	**3**	2	2	1	2	**4**
PARA	1100	Introduction to Law and Ethics	**3**	3	3	0	0	**3**
PARA	1105	Legal Research and Legal Writing I	**3**	3	3	0	0	**3**
PARA	1110	Legal Research and Legal Writing II	**3**	3	3	0	0	**3**
PARA	1115	Family Law	**3**	3	3	0	0	**3**
PARA	1120	Real Estate Law	**3**	3	3	0	0	**3**
PARA	1125	Criminal Law and Criminal Procedure	**3**	3	3	0	0	**3**
PARA	1130	Civil Litigation	**3**	3	3	0	0	**3**
PARA	1135	Wills, Trusts, and Estates	**3**	3	3	0	0	**3**
PARA	1140	Tort Law	**3**	3	3	0	0	**3**
PARA	1145	Law Office Management and Technology	**3**	3	3	0	0	**3**
PARA	1150	Contracts, Commercial Law and Business Organizations	**3**	3	3	0	0	**3**
Choose PARA 2200 or PARA 2210								
PARA	2200	Paralegal Practicum	**6**	0	0	6	18	**18**
PARA	2210	Paralegal Internship I	**6**	0	0	6	18	**18**
Electives: Choose 9 credit hours from the following:								
PARA	1200	Bankruptcy / Debtor - Creditor Relations	**3**	3	3	0	0	**3**
PARA	1205	Constitutional Law	**3**	3	3	0	0	**3**
PARA	1210	Legal and Policy Issues in Healthcare	**3**	3	3	0	0	**3**
PARA	1215	Administrative Law	**3**	3	3	0	0	**3**
PARA	2205	Advanced Legal Research and Writing	**3**	3	3	0	0	**3**
PARA	2215	Paralegal Internship II	**6**	0	0	6	18	**18**
ENGL	1105	Technical Communication	**3**	3	3	0	0	**3**
XXXX	xxxx	Guided Electives (3 to 9 hours)	**3**	3	3	0	0	**3**
General Education Core (18 hours)								
ENGL	1101	Composition and Rhetoric	**3**	3	3	0	0	**3**
SPCH	1101	Public Speaking	**3**	3	3	0	0	**3**
AREA II	xxxx	Social/Behavioral Sciences Elective	**3**	3	3	0	0	**3**
MATH	11xx	1100, 1101, 1103, or 1111	**3**	3	3	0	0	**3**
AREA IV	xxxx	Humanities/Fine Arts Elective	**3**	3	3	0	0	**3**
GEN ED	xxxx	Program-Specific General Core Elective	**3**	3	3	0	0	**3**
Total Degree Hours			**69**	**56+**	**56+**	**7+**	**20+**	**82-94**

Program Comparison Chart

Paralegal Studies Comparison @ $100 Per Credit Hour

CREDENTIALS	CURRENT CREDIT/CONTACT HOURS			PROPOSED CREDIT/CONTACT HOURS		
	Credit Hours	Tuition $	Contact Hours	Credit Hours	Tuition $*	Contact Hours
Paralegal Fundamentals TCC	12	$1,200	13	12	$1,200	13
Paralegal Studies Post-Baccalaureate Certificate TCC	30	$3,000	30	30	$3,000	30
Paralegal Studies Diploma	38-39	$3,800-$3,900	39	39	$3,900	40
Paralegal Studies Degree	69	$6,900	82-94	69	$6,900	82-94

APPENDIX C: WELDING & JOINING TECHNOLOGY PROGRAM REVIEW DOCUMENTS

Program Revision Summary

Welding Technology Program Curriculum Development Summary Points
January 24-25, 2019

Attendees:

Jordan Hunter, Chattahoochee; Doug Furman, Coastal Pines; William Burns, Savannah; Tony Simmons, Oconee Fall Line; Chris Cumbee, Southeastern; Jason Tanner, VPAA, Chattahoochee; Sasha Kahiga (note taker), TCSG; and Mike Howard, TCSG.

Welcome and Overview:

Saundra King welcomed all attendees to the first afternoon of the curriculum development sessions. Saundra stated that the charge for each work group would be to look closely at the content edits and feedback received for each area closely and then to work on creating new curriculum which would still maintain high quality content yet be more flexible and ensure students can get to market quicker than they can at present. Each attendee was able to introduce themselves to the others and then the groups broke out into their individual rooms to work.

Welding Technology Program Curriculum Development Summary:

Mike reported to the work group the recommendations from the initial work group meeting was distributed to industry throughout the state. Feedback received indicated content is on target with their needs. Mike charged the group to begin looking at the content and developing the new curriculum. They had the flexibility to revise existing courses or create new courses. Once courses were developed, they would begin assigning credit hours using 1:1 lecture and 2:1 lab contact hours to credit hours ratio. Next, they would look at the curriculum outline for the degree, diploma, and TCC programs.

While developing the curriculum, they were reminded to avoid redundancy of content and what industry requirements for a "get in the door" welder.

The welding work group discussed extensively the need to make changes to the current curriculum. With these changes the work group discussed the proper guidelines to keep the integrity of the program and ensuring that the changes does not negatively impact colleges, students and Dual enrollment programs throughout the state. Furthermore, the work group outlined and aligned many of the new learning outcomes to the updated AWS & WPS guidelines. The work group also discussed the need to review the welding elective courses to ensure that all certificates are updated to meet the proper guidelines. Lastly, the welding work group discussed the need to meet once more to realign certificates and possibly create certificates with specializations.

Conclusions and Next Steps:

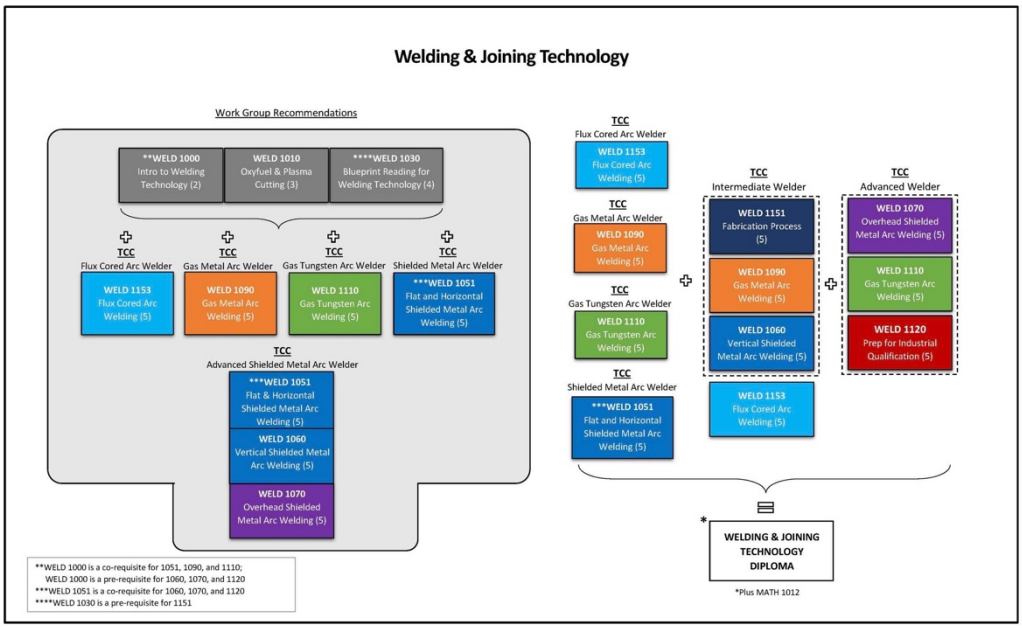
At the conclusion of the meeting, the Welding work group further refined course content and created a new curriculum outline for the diploma program.

The work group was not able to address all of the standard courses within the welding program due to the number of elective courses. The group will continue working on reviewing the content for recommended revisions to those additional courses.

Mike will review the recommendations and their impact on existing TCC programs.

Recommendations from the work group will be distributed to all Welding faculty for review in early February.

Program Visual



Proposed Courses and Competencies

Welding & Joining Technology

Work Group Recommendations

Flux Cored Arc Welder TCC (14 Credit Hours/18 Contact Hours)
WELD 1000 – Introduction to Welding Technology
WELD 1010 – Oxyfuel and Plasma Cutting
WELD 1030 – Blueprint Reading for Welding Technology
WELD 1153 – Flux Cored Arc Welding

Shielded Metal Arc Welder TCC (14 Credit Hours/18 Contact Hours)
WELD 1000 – Introduction to Welding Technology
WELD 1010 – Oxyfuel and Plasma Cutting
WELD 1030 – Blueprint Reading for Welding Technology
WELD 1051 – Flat and Horizontal Shielded Metal Arc Welding

Gas Metal Arc Welder TCC (14 Credit Hours/18 Contact Hours)
WELD 1000 – Introduction to Welding Technology
WELD 1010 – Oxyfuel and Plasma Cutting
WELD 1030 – Blueprint Reading for Welding Technology
WELD 1090 – Gas Metal Arc Welding

Gas Tungsten Arc Welder TCC (14 Credit Hours/18 Contact Hours)
WELD 1000 – Introduction to Welding Technology
WELD 1010 – Oxyfuel and Plasma Cutting
WELD 1030 – Blueprint Reading for Welding Technology
WELD 1110 – Gas Tungsten Arc Welding

Advanced Shielded Metal Arc Welder TCC (15 Credit Hours/18 Contact Hours)
WELD 1051 – Flat and Horizontal Shielded Metal Arc Welding
WELD 1060 – Vertical Shielded Metal Arc Welding
WELD 1070 – Overhead Shielded Metal Arc Welding

Intermediate Welder TCC (20 Credit Hours/24 Contact Hours)
WELD 1151 – Fabrication Process
WELD 1090 – Gas Metal Arc Welding
WELD 1060 – Vertical Shielded Metal Arc Welding
WELD 1153 – Flux Cored Arc Welding

Advanced Welder TCC (15 Credit Hours/18 Contact Hours)
WELD 1070 – Overhead Shielded Metal Arc Welding
WELD 1110 – Gas Tungsten Arc Welding
WELD 1120 – Preparation for Industrial Qualification

WAJ2 – Welding and Joining Technology (47 Credit Hours/57 Contact Hours)
MATH 1012 – Fundamentals of Mathematics
WELD 1000 – Introduction to Welding Technology
WELD 1010 – Oxyfuel and Plasma Cutting

WELD 1030 – Blueprint Reading for Welding Technology
WELD 1051 – Flat and Horizontal Shielded Metal Arc Welding
WELD 1060 – Vertical Shielded Metal Arc Welding
WELD 1070 – Overhead Shielded Metal Arc Welding
WELD 1090 – Gas Metal Arc Welding
WELD 1110 – Gas Tungsten Arc Welding
WELD 1120 – Preparation for Industrial Qualification
Choose one of the following courses:
- WELD 1150 – Advanced Gas Tungsten Arc Welding
- WELD 1151 – Fabrication Processes
- WELD 1152 – Pipe Welding
- WELD 1153 – Flux Cored Arc Welding

WELD 1000: Introduction to Welding Technology
Credit Hrs: 2 (Lecture – 1; Lab - 1; 3 contact hours per week)

Competency #1: Industrial Safety and Health Practices

1. Apply basic safety and health practices as applicable to the welding process.
2. Demonstrate OSHA 10 Hour training competencies
3. Identify the types of welding power sources and identify the type of current they produce.
4. Determine the operating capacity of a welding machine.

Competency #2: Hand Tool and Power Machine Use

1. Demonstrate the ability to safely use and operate hand and power tools.

Competency #3: Measurement

1. Demonstrate the ability to make exact measurements using the English system.
2. Demonstrate the ability to make exact measurements using the metric system.
3. Convert from English to Metric units
4. Read weld gauges for quality control

Competency #4: Introduction to Welding Processes

1. Students will describe a basic understanding of the different welding processes
2. Identify common nomenclatural in welding processes.

WELD 1010 – Oxyfuel and Plasma Cutting

Credit Hrs: 3 (Lecture – 1; Lab - 2; 5 contact hours per week)

Competency #1: Safety Procedures

1. Apply basic safety and health practices as applicable to the cutting process. (ADD)
2. Demonstrate safe handling of cylinders.
3. Identify protection procedures of regulator seats and gauges, hoses and fittings, torches and tips.
4. Demonstrate personal safety procedures by wearing gloves, suitable body protection, adequate shade or eye protection, and/or high top shoes or boots.
5. Remove flammable materials form cutting area.

Competency #2: Metal Heating and Cutting Techniques

1. Define rapid oxidation.
2. Demonstrate reaction of preheated steel and pure oxygen.
3. Select equipment that will produce preheat flame and oxygen jet for cutting.
4. Assemble cutting equipment.
5. Identify protection procedures of regulator seats and gauges, hoses and fittings, torches and tips.
6. Set up equipment.
7. Determine when preheat temperature is reached.
8. Describe safe and appropriate metal cutting techniques.

Competency #3: Manual and Automatic Oxyfuel Cutting Techniques

1. Demonstrate manual cuts free hand and with guide, pierce holes, bevel, thin metal circular cuts, and gauging.
2. Set up equipment.
3. Demonstrate aligning machine with metal to be cut, set travel speed; make straight cuts and bevels.

Competency #4: Oxyfuel Pipe Cutting

1. Layout line on pipe to make a bevel cut.
2. Demonstrate cuts as laid out for configured pipe joints.
3. Demonstrate bevel cuts on pipe.

Competency #5: Plasma Torch and Theory

1. Define plasma torch theory.
2. Identify plasma torch parts.

Competency #6: Plasma Machine Set Up and Operation

1. Select proper equipment, gas/air pressure, and demonstrate set up for ferrous/non-ferrous and material thickness.

Competency #7: Plasma Cutting Techniques

1. Execute ferrous/non-ferrous straight cuts and pattern and bevel cuts.

Program Chart

Welding & Joining TCCs & Diplomas

Intermediate Welder TCC

Course	Number	Title	Total Credit Hours	Lecture Credit Hours	Lecture Contact Hours	Lab Credit Hours	Lab Contact Hours	Total Contact Hours Per Week
WELD	1151	Fabrication Process	5	4	4	1	2	6
WELD	1090	Gas Metal Arc Welding	5	4	4	1	2	6
WELD	1060	Vertical Shielded Metal Arc Welding	5	4	4	1	2	6
WELD	1153	Flux Cored Arc Welding	5	4	4	1	2	6
Total Certificate Hours			**20**	**16**	**16**	**4**	**8**	**24**

Advanced Welder TCC

Course	Number	Title	Total Credit Hours	Lecture Credit Hours	Lecture Contact Hours	Lab Credit Hours	Lab Contact Hours	Total Contact Hours Per Week
WELD	1070	Overhead Shileded Metal Arc Welding	5	4	4	1	2	6
WELD	1110	Gas Tungsten Arc Welding	5	4	4	1	2	6
WELD	1120	Preparation for Industrial Qualification	5	4	4	1	2	6
Total Certificate Hours			**15**	12	12	3	6	**18**

Flux Cored Arc Welder TCC

Course	Number	Title	Total Credit Hours	Lecture Credit Hours	Lecture Contact Hours	Lab Credit Hours	Lab Contact Hours	Total Contact Hours Per Week
WELD	1000	Introduction to Welding Tech.	2	1	1	1	2	3
WELD	1010	Oxyfuel & Plasma Cutting	3	1	1	2	4	5
WELD	1030	Blueprint Reading for Welding Tech.	4	4	4	0	0	4
WELD	1153	Flux Cored Arc Welding	5	4	4	1	2	6
Total Certificate Hours			**14**	10	10	4	8	**18**

Gas Metal Arc Welder TCC

Course	Number	Title	Total Credit Hours	Lecture Credit Hours	Lecture Contact Hours	Lab Credit Hours	Lab Contact Hours	Total Contact Hours Per Week
WELD	1000	Introduction to Welding Tech.	2	1	1	1	2	3
WELD	1010	Oxyfuel & Plasma Cutting	3	1	1	2	4	5
WELD	1030	Blueprint Reading for Welding Tech.	4	4	4	0	0	4
WELD	1090	Gas Metal Arc Welding	5	4	4	1	2	6
Total Certificate Hours			**14**	10	10	4	8	**18**

Gas Tungsten Arc Welder TCC

Course	Number	Title	Total Credit Hours	Lecture Credit Hours	Lecture Contact Hours	Lab Credit Hours	Lab Contact Hours	Total Contact Hours Per Week
WELD	1000	Introduction to Welding Tech.	2	1	1	1	2	3
WELD	1010	Oxyfuel & Plasma Cutting	3	1	1	2	4	5
WELD	1030	Blueprint Reading for Welding Tech.	4	4	4	0	0	4
WELD	1110	Gas Tungsten Arc Welding	5	4	4	1	2	6
Total Certificate Hours			**14**	10	10	4	8	**18**

Shielded Metal Arc Welder TCC

Course	Number	Title	Total Credit Hours	Lecture Credit Hours	Lecture Contact Hours	Lab Credit Hours	Lab Contact Hours	Total Contact Hours Per Week
WELD	1000	Introduction to Welding Tech.	2	1	1	1	2	3
WELD	1010	Oxyfuel & Plasma Cutting	3	1	1	2	4	5
WELD	1030	Blueprint Reading for Welding Tech.	4	4	4	0	0	4
WELD	1051	Flat and Horizontal Shielded Metal Arc Welding	5	4	4	1	2	6
Total Certificate Hours			**14**	10	10	4	8	**18**

Advanced Shielded Metal Arc Welder TCC

Course	Number	Title	Total Credit Hours	Lecture Credit Hours	Lecture Contact Hours	Lab Credit Hours	Lab Contact Hours	Total Contact Hours Per Week
WELD	1051	Flat & Horizontal Shielded Metal Arc Welding	5	4	4	1	2	6
WELD	1060	Vertical Shielded Metal Arc Welding	5	4	4	1	2	6
WELD	1070	Overhead Shielded Metal Arc Welding	5	4	4	1	2	6
Total Certificate Hours			**15**	12	12	3	6	**18**

Welding & Joining Technology Diploma

Course	Number	Title	Total Credit Hours	Lecture Credit Hours	Lecture Contact Hours	Lab Credit Hours	Lab Contact Hours	Total Contact Hours Per Week
MATH	1012	Fundamentals of Mathematics	3	3	3	0	0	3
WELD	1000	Introduction to Welding Tech.	2	1	1	1	2	3
WELD	1010	Oxyfuel & Plasma Cutting	3	1	1	2	4	5
WELD	1030	Blueprint Reading for Welding Tech.	4	4	4	0	0	4
WELD	1051	Flat & Horizontal Shielded Metal Arc Welding	5	4	4	1	2	6
WELD	1060	Vertical Shielded Metal Arc Welding	5	4	4	1	2	6
WELD	1070	Overhead Shielded Metal Arc Welding	5	4	4	1	2	6
WELD	1090	Gas Metal Arc Welding	5	4	4	1	2	6
WELD	1110	Gas Tungsten Arc Welding	5	4	4	1	2	6
WELD	1120	Preparation for Industrial Qualification	5	4	4	1	2	6
Choose one of the following courses:								
WELD	1150	Advanced Gas Tungsten Arc Welding	5	4	4	1	2	6
WELD	1151	Fabrication Processes	5	4	4	1	2	6
WELD	1152	Pipe Welding	5	4	4	1	2	6
WELD	1153	Flux Cored Arc Welding	5	4	4	1	2	6
Total Diploma Hours			**47**	37	37	10	20	**57**

Program Comparison Chart

Welding Program Comparison

CREDENTIALS	CURRENT		PROPOSED	
	Credit Hours	Contact Hours	Credit Hours	Contact Hours
Shielded Metal Arc Welder TCC	N/A	N/A	14	18
Intermediate Welder TCC	N/A	N/A	20	24
Advanced Welder TCC	N/A	N/A	15	18
Flux Cored Arc Welder TCC	15	18 + Elective	14	18
Gas Metal Arc Welder TCC	15	18 + Elective	14	18
Gas Tungsten Arc Welder TCC	15	18 + Elective	14	18
Advanced Shielded Metal Arc Welder TCC	12	18	15	18
Welding & Joining Technology Diploma	54	68 + Elective	47	57

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

Introduction

Prompted by the need to evaluate academic program content, contact hours, and credit hours, TCSG moved forward with a decision to conduct a comprehensive program review of all programs beginning in fall 2018. During the time that the system converted from quarter to semester hours a decade earlier, proper calculation of hours was not considered resulting in a complex calculation of contact hours using decimals. The courses were simply "forced" into semester hours without proper review to content, especially the number of required lab hours. Add to that, many programs had never undergone serious review during that decade. While each program at each college did maintain advisory councils, it was not apparent that these advisory councils provided input into program content.

The Guide contained in Chapter Four describes the process and best practices TCSG developed to address these needs and institute a formalized program review process that was directly connected to market needs, both current and future.

Delimitations of this Guide/Model

While the Guide provides a process through which a college can conduct a comprehensive program review, it is focused on programs offered through the credit side of the college, not those offered through the non-credit side of the college. While economic development departments can offer similar training programs as those offered as credit

bearing, for the purpose of guide and this dissertation, a decision was made to keep the focus on the credit bearing programs.

As noted in Chapter Three, the author made several decisions that affected the Guide's content. First, the Guide was designed specifically for community and technical college faculty and staff; thus, consideration has not been given to traditional transfer programs at either the community college or four-year college/university. While community colleges and some technical colleges do have a transfer mission, providing workforce training is also an important part of their mission. Therefore, the focus of this Guide is to provide a framework through which to measure the efficacy of academic programs developed to provide workforce training.

The product does not provide a student perspective of the alignment of academic programs to workforce needs; thus, it does not provide the opportunity to hear from students. The focus of the Guide is centered on meeting workforce demands and the alignment of academic programs. While this can be done without student input, should a college or system wish to do so, feedback from students can be gained through a survey or focus group.

The product does not address the financial aspect of making needed changes to academic programs; thus, at a college or system in which a return on investment (ROI) is important, that element will need to be included in a program review process. Examples of financial considerations include both the need for increased and decreased financial obligations. Decreased financial obligations include the elimination of program faculty and staff, equipment, and space. Increased financial obligations include the cost of hiring new faculty and staff, purchasing expensive equipment, and instructional space.

Challenges and Recommendations

Community and technical colleges face varied challenges, such as structure and governance that could make the implementation of a comprehensive program review challenging. The Guide is developed, however, to provide a basic framework for other colleges and systems. The steps and strategies presented are designed with flexibility. Throughout the Guide, recommendations and options for addressing challenges that typically arise when attempting broad, extensive curricular review and revision. These are highlighted here as well.

Addressing Fear of Change

Fear of change among faculty and staff is real and must be understood and addressed. The Diffusion of Innovation model, developed by E. M. Rogers, provides a valuable framework through which to view implementation and anticipate challenges. The five adopter categories as identified by LeMorte (2016) are:

1. Innovators: The group who generally adopts the new initiative. It is from this group that champions will rise at the campus level and assist with deflecting negativity.
2. Early Adopters: Leaders who will benefit from manuals and information. These people will assist with developing this material.
3. Early Majority: People who need to see evidence, but once they have proof that the initiative will work, they will adopt. These Individuals will assist with the development of assessment and review of data.
4. Late Majority: Includes people who drag their feet and adopt when they realize no other option exists.
5. Laggards: Those who do not accept change and will only do so when faced with pressure or fear.

One of the recommended steps that the Guide offers is to conduct collaborative meetings with college faculty and staff as well as business and industry. This participation can

alleviate some anxiety among those who fear change. You will see evidence of both Innovators and Early Adopters during these meetings. As the program review process progresses, you will begin to see the Early Majority begin to accept the process and any needed changes. Those individuals in the Late Majority and Laggard categories will be present, but once evidence of needed change has been made and approved, they will have no choice but to adapt to the needed curricular changes.

Collecting Essential Data

Obtaining and reviewing program data and information is an essential part of conducting a comprehensive program review. These data provide a baseline of what exists today. Assistance from an institutional research or programming assistance may be needed to identify and collect college- or system-level data as well as providing trend lines. Not all states provide workforce data. If this is not easily provided by your state's labor or workforce department, it will be difficult to obtain accurate information. The Guide categorizes three groups of program information:

1. Enrollment, graduation rates, placement rates and examination of trend lines in each area. Some of this information such as enrollment can be obtained directly from your student information system. Assistance from institutional research will be needed to access graduation and placement rates.

2. Program outcomes, courses, as well as length of a program will need to be reviewed. If your system or college has an academic data base such as exists at TCSG, this information can be extracted in report format. If a data base is nonexistent, then information can be obtained from the academic department, or with assistance from a college registrar.

3. Workforce data. States provide this information differently with varying levels of depth. This is time consuming to gather, organize, and overlap with college offerings. A labor market data company such as Lightcast can be contracted to provide industry, occupational, education, and demographic data.

Support, Buy-in, and Endorsement

Support is needed at all levels. That includes college or system senior leadership — president or chancellor, vice presidents; mid-level leadership, such as associate or assistant vice presidents and deans; and instructional faculty and staff. Nevarez, Wood, and Penrose articulate that a team-based approach is most effective to guide efforts (2013, p. 116), thus supporting the Guide's suggested meeting with collaboration between college and workforce.

It is critical to have the endorsement and leadership of the college or system head. Also important is the need for a comprehensive understanding of the process and possible outcomes. It is also important to have as much buy-in as possible and agreement before beginning. This example illustrates the complexity of program review decisions and the importance of full awareness and commitment by leadership: When the TCSG program review process was approved by the system presidents, they supported, but did not consider all elements. They did not anticipate nor discuss that a recommendation to eliminate a course or courses could be presented. When that proposal was presented, they were faced with approving a recommendation that would financially impact the colleges as tuition revenue would be decreased. At TCSG this stalled the review process. All appeared to agree that having business and industry representation was important, and some expressed the desire to have their annual advisory committee meetings be more robust and include conversation around workforce needs and academic programs.

Faculty support is also critical. Faculty are the credentialed and content experts. In the Trade and Industry (T & I) fields such as welding, plumbing, industrial maintenance, drafting, and automotive technology, they are also experienced practitioners. They are the instructors of

both the textbook material and facilitators of applied learning. Because of their familiarity with their field, however, they may also develop a level of resistance to change. To address this hesitancy, consider The Diffusion of Innovation model and utilize the framework for the selection of faculty and staff who fit into the five adopter categories identified by LeMorte (2016). Patience and effective communication are essential when implementing any new process.

Research Recommendations

Several recommendations are presented to address or continue the efforts presented in this dissertation. First, in Chapter One, three examples of program review were identified and discussed: *Programs of Study (POS) Design Framework* by Bragg (2017), *The Instructional Program Improvement Resource Guide* developed in 2003 by the Community College System of California, and *Steps for Conducting a Return on Investment (ROI) Model* by Kotamraju (2011). In addition to the Guide developed for this dissertation, additional research and examples are needed to expand, enhance, and provide guidance for program review available to technical and community colleges.

Second, while this Guide did not focus on transfer programs, consideration should be given to traditional transfer programs at either the community college or four-year college/university in terms of effective, data-based program review. Community colleges offer open admissions and serve as a pipeline to four-year colleges and universities, which ultimately do provide skilled workforce. A recommended starting point for this process could be a review of articulation agreements between the institutions. Collaborative meetings with faculty and

administrative staff from both institutions should be held and curriculum reviewed. This would be a similar process as recommended for the review of T & I programs. This process could be expanded to include any other "feeder" organization such as local high schools or if applicable, Adult Basic Education programs.

Third, as noted previously, including a student perspective of academic programs would be an important component in the program review process. These insights can be achieved through a survey or focus group. Compiling feedback from graduates who have entered the workforce can provide perspective regarding the level of satisfaction on training needed for job success. Were the graduates prepared to do the job they were trained and hired to do? If not, are there recommendations of program changes or enhancements?

A final recommendation is the addition of a thorough ROI review as part of the program review process. Examples of financial considerations include both the need for increased and decreased financial obligations. Decreased financial obligations include the elimination of program faculty and staff, equipment, and space. Increased financial obligations include the cost of hiring new faculty and staff, purchasing expensive equipment, and instructional space. Kotamraju (2011) recommends the following five steps be included in conducting a ROI review: (1) Needs assessment, (2) Feasibility study, (3) Process Evaluation, (4) Outcomes Evaluation, and (5) Cost Analysis. Adding this component would provide program evaluators with important short- and long-term information on which to base their decisions and expand their market-based information.

Conclusion

The motivation in the development of the Guide came from the researcher's experiences of conducting a comprehensive program review with little guidance. The Guide was developed from first-hand experience as well as extensive research. The purpose of the Guide is to serve as a resource for community and technical college practitioners as they strive to ensure that the academic programs offered at their college efficaciously meet the workforce needs of their area. The Guide is designed to provide direction and offer strategies related to various facets of program development and implementation. With solid support, human and financial resources, and professional development efforts in place, community colleges will be well-equipped to conduct comprehensive program reviews, thus strengthening efforts to meet America's future workforce skills demands.

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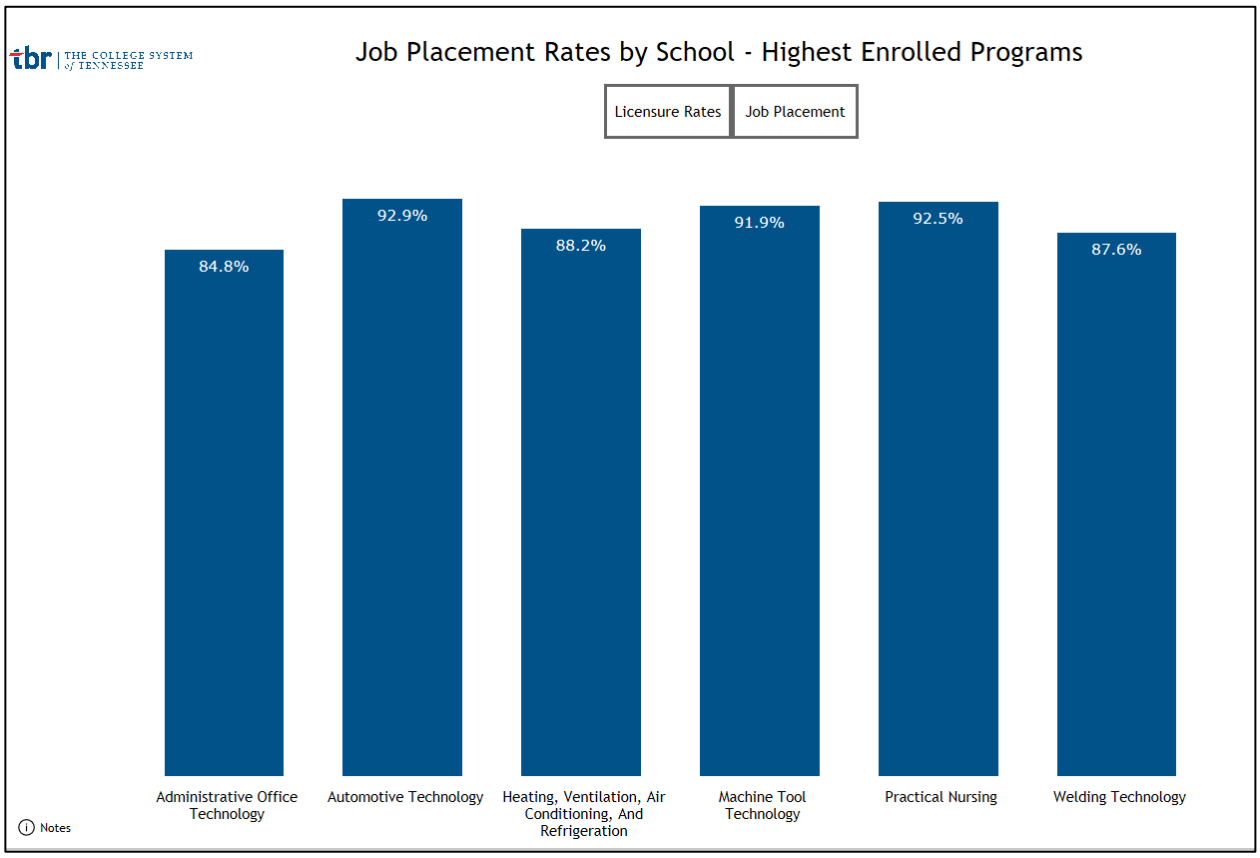
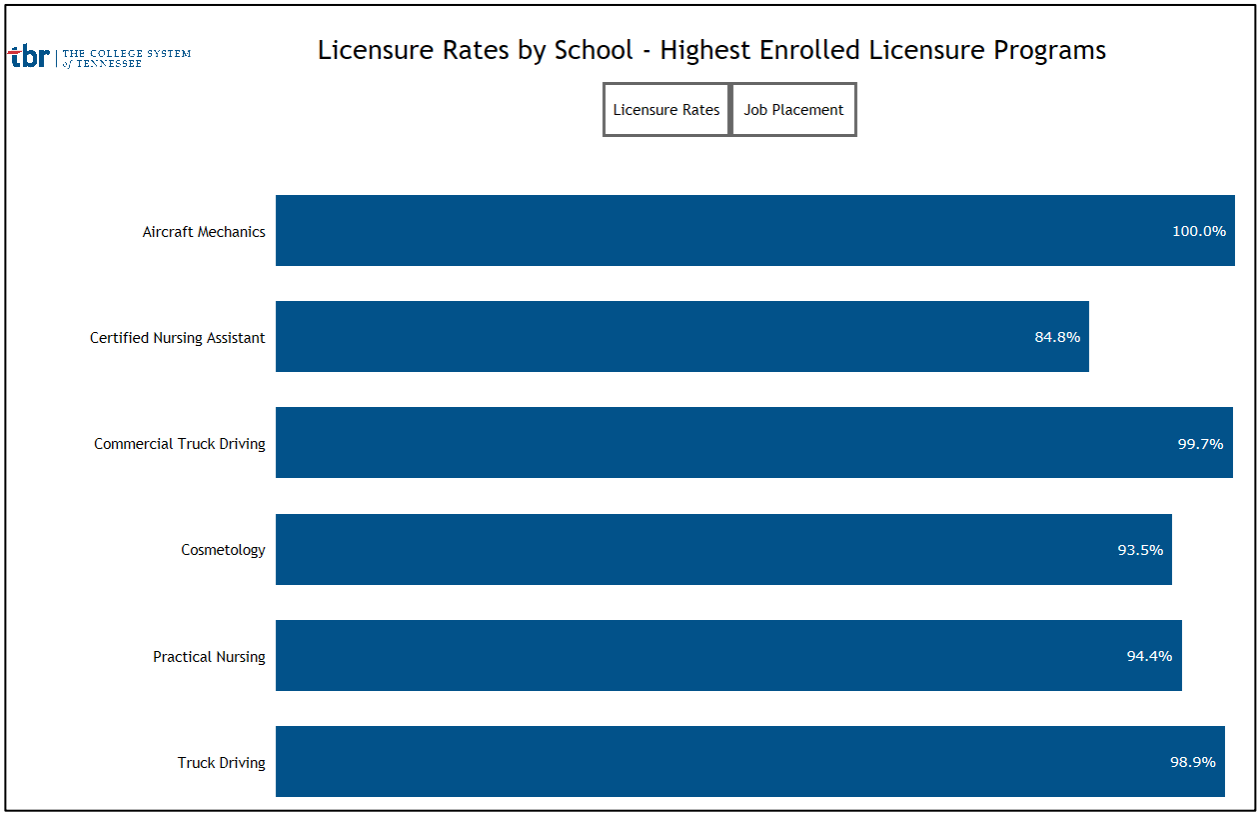
APPENDIX A: EXAMPLES OF PROGRAM REVIEW DATA


tbr | THE COLLEGE SYSTEM of TENNESSEE
Job Placement Rates by School - Highest Enrolled Programs
Licensure Rates
Job Placement
84.8%
92.9%
88.2%
91.9%
92.5%
87.6%
Administrative Office Technology
Automotive Technology
Heating, Ventilation, Air Conditioning, And Refrigeration
Machine Tool Technology
Practical Nursing
Welding Technology
Notes


tbr | THE COLLEGE SYSTEM of TENNESSEE
Licensure Rates by School - Highest Enrolled Licensure Programs
Licensure Rates
Job Placement
Aircraft Mechanics
100.0%
Certified Nursing Assistant
84.8%
Commercial Truck Driving
99.7%
Cosmetology
93.5%
Practical Nursing
94.4%
Truck Driving
98.9%