



## AN ABSTRACT OF THE DISSERTATION OF

Kate Dins for the degree of Doctor of Philosophy in Education presented on November 15, 2005.

Title: “Chunking” Professional-Technical Programs to Create Pathways to Degree Completion in Community Colleges.

Abstract approved:

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The purpose of this study was to explore the phenomenon of community colleges creating pathways to degree completion in professional-technical programs by breaking degree programs into smaller portions, referred to as “chunks.” The purpose or possible advantage of chunking was that it would improve the rate of degree completion among community college students by allowing students to complete a degree non-sequentially and non-continually, leading to better wages and career advancement. The research design included a qualitative instrumental case study methodology with three community colleges selected using reputational-case selection. The following questions guided the research: (1) What issues need to be anticipated when chunking professional-technical programs? (2) How can those issues be resolved? (3) What guidelines should be used when implementing chunking?

The issues that arose when chunking to create pathways fell primarily into three areas: student issues; institutional issues; and external issues. Each of the colleges included in this study developed multiple strategies to address these issues. Preliminary guidelines, based on interview data, were organized into four overarching themes: 1) guidelines to promote participation in chunking by faculty and staff; 2)

guidelines for selection and design of chunked programs; 3) guidelines to support students; and 4) guidelines to ensure connections to the labor market. A fact sheet of guidelines, based on the study and relevant literature, was developed to advise community colleges considering the implementation of chunking.

Chunking curriculum to create pathways was seen as an effective way to increase student success and program completion in community college professional-technical programs. Chunking was also seen as a way to reinvigorate the curriculum and to reenergize the faculty by creating an atmosphere that encouraged flexibility and creativity, as well as building better relationships with and between students and employers. Thus, it was especially critical that faculty assumed leadership over the changes to the curriculum, and thereby, fully owned the redesigned program. In the colleges studied, there was a synergy evident among enthusiastic faculty, dedicated advisory boards, and students - all committed to their profession and their community, resulting in flexibility and innovation in program design.

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Chunking Professional-Technical Programs to Create Pathways to  
Degree Completion in Community Colleges

by  
Kate Dins

A DISSERTATION

submitted to

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degree of

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Doctor of Philosophy dissertation of Kate Dins  
presented on November 15, 2005.

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I understand that my dissertation will become part of the permanent collection of Oregon State University libraries. My signature below authorizes release of my dissertation to any reader upon request.

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Kate Dins, Author

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## DEDICATION

To Nicholas, Michael, Haden, and Morgan – and their *other* fairy godmother.

Anything is possible. Now let's play!

# Chunking Professional-Technical Programs to Create Pathways to Degree Completion in Community Colleges

## CHAPTER I - INTRODUCTION

*“College in America is a great prize, nothing short of a gateway to the American dream” (Kahlenberg, 2004, p. vii).*

However, among students at community colleges who begin an Associate’s degree program, fewer than half have earned their degree or are still enrolled after five years. For students needing remedial courses, English language proficiency, or a General Educational Development (GED) certificate before they can enter an Associate’s program, the proportion earning a postsecondary credential is even smaller. Over 40% of community college students nationally need at least one remedial course before beginning their planned studies and, in urban areas, that figure may rise to 75% (Kazis & Liebowitz, 2003). For students of color and those with low incomes, the numbers earning a credential fall even lower (Grubb, 1999). Six-year completion rates for African-Americans who began attending a community college in 1995 were 10.8%, compared to 28.4% for Caucasian students (Bailey, Jacobs, Jenkins, & Leinback, 2003). While these low completion rates are troubling, it is important to recognize that persons enrolled in community colleges have a variety of reasons for attending a community college and an Associate's degree may not be their educational goal.

Shifting to the more specific geographic context in Oregon, where I live and work, almost 400,000 individuals took courses at Oregon’s community colleges in the 2002 – 2003 academic year, with 88,145 of those students enrolled in courses eligible for transfer to a state university. However, Oregon’s community colleges conferred

only 6,399 Associate's degrees in that year (Graves, 2004). Completion of an Associate's degree has a positive impact on employment, income, and career advancement, yet Oregon's community colleges issued degrees to only 7% of students taking college-credit courses in the 2002 – 2003 academic year (Graves, 2004). Again, it is important to recognize that degree completion is not the goal of all 400,000 community college student enrolled in the 2002 -2003 academic year. However, I contend that the small number of degrees awarded is an area of concern, given the benefits of an Associate's degree.

Turning back to a national context, during the past several years there has been increasing discussion of the importance of degree completion and of the need to develop more flexible methods that could lead to increasing numbers of community college students who complete Associate's degrees (Jacobs & Grubb, 2002). One promising practice is to break the Associate's degree into smaller pieces or "chunks" and communicate to students a clearer roadmap of how a degree can be completed through the systematic completion of these chunks.

#### Focus of the Study

Poppe, Strawn, and Martinson (2004) asserted that the development of career pathways is an essential component of an effective education and training system that will encourage more students to improve basic skills, complete college credentials, secure employment, and advance in their careers. Chunking is thought to be one element in the development of career pathways in community colleges, and a possible solution to increase the number of students completing professional-technical degrees in community colleges and, thereby, increasing their earning and career advancement

potential. Career pathways and chunking have risen mostly out of the workforce education branch of the community college in response to concerns about low-income workers lacking postsecondary credentials (Jacobs, 2003; Mazzeo, Rab, & Alssid, 2003; Poppe et al., 2004). A career pathway or educational pathway (these phrases are used interchangeably) is defined as a series of connected and integrated educational services that include academic and vocational coursework, work experience, on-the-job training, and support services that enables students to combine work and school, and advance over time to better jobs and higher levels of education and training (Jenkins, 2003).

The purpose of this qualitative research study was to explore ways of promoting the completion of degrees in professional-technical programs through breaking the program into smaller sections, which I will call chunking. Each chunk leads to employment and connects to the next chunk, eventually leading to completion of a state-approved professional-technical degree. The purpose or possible advantage of chunking is that it will improve the rate of degree completion among community college students by allowing students to complete a degree non-sequentially and non-continually, leading to better wages and career advancement.

The more specific research questions were:

1. What issues need to be anticipated when chunking professional-technical programs?

Chunking is a relatively new phenomenon and many colleges are considering its implementation as part of a system of educational pathways to degree completion. However, there has been little research conducted on this new practice, making it

critical to explore the issues that should be considered when implementing chunking in professional-technical programs at community colleges.

## 2. How can those issues be resolved?

If community colleges are to successfully implement chunking, they should not only understand the issues, but how these issues can be resolved. My research will allow colleges to avoid the duplication of investigating these questions at each community college interested in implementing chunking.

## 3. What guidelines should be used when implementing chunking?

Finally, I identified guidelines that can be used to develop effective and efficient models of chunking professional-technical programs. These guidelines suggest areas for future research, as well as evaluation criteria for chunking.

### Significance of the Study

The purpose of my study was to explore the practice of chunking professional-technical degrees as a way to improve the rate of degree completion in community colleges. There are four reasons for the significance of the study: 1) the rate of degree completion among students at community colleges is small, 2) there is substantial monetary benefit with degree completion – to both the individual and the community, 3) there is considerable discussion among practitioners about creating pathways to degree completion through curriculum chunking, yet there is limited research on which to base decisions, and 4) I have a personal and professional interest in advancing chunking as a way of making education and degree attainment more likely for low-income and minority students. Each of these reasons is described in more detail below.



Completion of a degree or occupational certificate provides economic gain to the individual and this translates into benefit for the larger community through increased income flowing through the local economy, and decreased use of public resources such as welfare (Grubb, 1996b; Jacobs, 2001; Poppe et al., 2004). Job training alone is not enough to provide the kind of economic benefit that will lift individuals out of poverty (Grubb, 1996a). Gillum and Davies (2003) estimate that the average yearly impact on earnings for an individual who completes an Associate's degree is approximately \$3,835 per year, compared to a control group. The impact of degree completion is even more significant for women. Grubb (1996b) found that women with an Associate's degree earn up to 50% more and men earn 15% to 30% more, compared to those with only a high school diploma.

Christophersen and Robison (2002), in an analysis of the socioeconomic impact generated by Oregon Community Colleges, found that the average yearly earnings for a person completing an Associate's degree was \$35,616, compared to \$30,288 for a 1-year Certificate, \$26,107 for a High School Diploma or equivalent, and \$16,751 for those without a High School Diploma or equivalent. Christophersen and Robison found that 4,714 individuals completed an Associate's degree in the 1999-2000 academic year in Oregon community colleges. Based on the difference in income between a person with a high school diploma and an Associate's degree, the potential extra income generated in one year in Oregon would be \$44,825,426. They estimated that the State of Oregon would collect 16.8% in extra taxes or about \$7,530,671 on this earned income. Finally, Christophersen and Robison estimated that the economic benefits in one year to the State of Oregon in higher earnings, improved

health, decreased welfare and unemployment benefits, and lower crime rate was \$83,124,106 because of those completing an Associate's degree.

Community college students are more likely to be low-income, academically unprepared, older, attend college part-time, work full-time, and be a member of a minority group (Bailey & Kienzl, 1999; Haggan, 2000; Wild & Ebbers, 2002). For these students, the reality of completing a degree can seem almost unattainable. It is critical for community colleges to devise methods to support these students in the completion of a degree or other credential that will lead to increased income and career advancement.

Several researchers and community college practitioners contend that a critical component of the development of pathways is a system of connected coursework that provides a clear roadmap for completion of an Associate's degree non-sequentially (Jenkins, 2003; Poppe et al., 2004; Workforce Strategy Center, 2002). One model, proposed by Dins and others (2004), is that students complete credentialed portions of an Associate's degree that lead to employment in their chosen career field and later return to complete the next credentialed portion of the degree, until they have completed an Associate's degree. This bundling of certificates and degrees into smaller chunks is the framework upon which career pathways can be constructed.

As a community college administrator with almost 20 years experience in education, training, and workforce development, I have witnessed the tendency for students to complete non-credit and non-transferable coursework or to complete only that portion of a degree that will secure immediate employment. These students return

when the economy sours and they've lost their jobs, and are sometimes disheartened to find that they have no transferable credits.

### Summary

I have outlined the economic benefits of degree completion, as well as the problem of low graduation rates in community colleges. I have introduced the concept of chunking Associate's degrees to create pathways that may lead to higher rates of degree completion and expected economic gain to students and the larger community. While much has been written on the issues of student retention, and the financial advantages of degree completion, little or no research has been published that explores chunking as a way to create pathways to increase degree completion. My research goal was to explore the development of chunking with the help of those who are writing about it, as well as those who have actually put chunking into practice. The research was intended to help in developing models that promote chunking and provide tools that will aid in chunking degrees to foster pathways to degree completion. The commitment by community colleges to new curricular and programmatic structures such as chunking professional-technical degrees may help fulfill the promise of higher education and bring educational opportunity, economic stability, and career growth to those most in need of the benefits of education.

I have stated that the overall purpose of this qualitative research study was to explore ways to promote the completion of degrees in professional-technical programs by breaking the program into more manageable chunks, each of which leads to employment and connects to the next chunk, eventually leading to completion of a state-approved professional-technical degree. The goal of chunking is that it will

improve the rate of degree completion among community college students by allowing students to complete a degree non-sequentially and non-continually, leading to better wages and career advancement.

To implement the study I identified three community college systems which practice the chunking of pathways, and I approached each of them armed with the following three research questions:

- (1) What issues need to be anticipated when chunking professional-technical programs?
- (2) How can those issues be resolved?
- (3) What guidelines should be used when chunking is implemented?

In the next section, I will review relevant literature in two critical areas that further confirm the significance of the topic chosen, explore what is already known about responses to the research questions, and support the methodology selected for my study.

## CHAPTER II - REVIEW OF RELATED LITERATURE

My goal, with respect to chunking professional-technical programs in community colleges, was to study and advance chunking as a way to increase the number of students completing professional-technical degrees. I identified concerns relevant to the chunking of degrees and proposed possible solutions that resolve these concerns. I identified factors to consider and proposed guidelines that lead to criteria for evaluating the effectiveness of chunking, as well as raise future research questions. The introduction of each section of the review of literature includes an explanation and rationale for how that section contributes to the study's focus and design. In order to develop the background and relevant information necessary to achieve the study's purpose, this literature review includes the following areas:

1. Student retention, persistence, and degree completion
2. Pathways and chunking in education.

### Student Retention, Persistence, and Degree Completion

In this section, I examined issues of student retention, persistence, and degree completion at community colleges. Relevant literature identifying the common characteristics of community college students, as compared to university students; factors that influence retention, persistence, and degree completion; and institutional practices that improve retention, persistence, and degree completion were examined. Finally, the strengths and limitations of these studies will be described, as well as the knowledge they contributed to my research. Factors affecting retention, persistence, and degree completion are significant in setting the stage for the discussion of what must be in place for pathways and chunking to be successful. Community colleges

interested in designing chunks will need to look at the factors influencing whether students make successful transitions or not and develop each chunk in that context.

The first step in understanding the factors that influence retention, persistence, and degree completion was developing a definition of these terms that is useful in the context of community colleges. The traditional definition of student retention was developed within a university context and focuses on the completion of a baccalaureate degree within a designated period of time. Retention was redefined by those writing about the community college context to include completion of a degree within a specified period of time, as well as continuing enrollment, and persistence toward the student's self-defined educational goal (Summers, 2003; Wild & Ebbers, 2002). For the purposes of my review, the most important consideration was to examine ways the literature on retention and persistence could inform the approach taken in fully developing my study on chunking professional-technical degree programs.

### *Characteristics Common to Community College Students*

In examining the literature on student retention, it was clear that characteristics common to community college students are different than those common to students attending four-year institutions. Students in community college are more likely to be the first person in their family to attend college. They are more likely to be a member of a racial or ethnic minority group. Persons attending community colleges are more often academically unprepared than those entering four-year institutions. Finally, community college students are more often working full-time and struggle financially because of low socioeconomic status. All of these factors

are consistent with lower rates of retention, persistence, and degree completion (McConnell, 2000; Summers, 2003; Wild & Ebbers, 2002).

### *Factors That Influence Retention*

Summers (2003) examined attrition research on the community college and concluded that a complex interaction of student characteristics, environmental factors, and academic variables affected whether or not a student continued to be enrolled in a community college from term-to-term. He described several theoretical models of student attrition developed by Spady (1970, 1971), Tinto (1975, 1997), and Bean and Metzner (1985) and offered distinctions between the factors and variables outlined above, and concluded that community college students were more likely to drop out if they work full-time, register late for classes, do not have specific educational goals, perform poorly in classes, and do not take advantage of student support services.

The strength of Summers' research was that it summarized many previous research efforts, as well as the theoretical models developed from the research. He also provided suggestions for future research and the implications for community college professionals. The focus of Summers' research was almost exclusively on student behavior, but he provided little information on the institutional factors which impact student attrition, which is a critical piece for community colleges attempting to design educational pathways that include chunking of degrees to improve retention and degree completion.

What follows next is a selection of three recent studies on retention of community college students; they were chosen to give a sense of the range of studies

on this topic, the variety of students studied, and they focused on professional-technical programs.

Kostick's (2001) study of women welfare recipients attending the community college found that significant barriers to college enrollment included the demands of parenthood and employment, lack of support from spouses, poor information about financial aid, inflexibility of financial aid rules, and negative beliefs about the ability to succeed in or afford college. The women in Kostick's study "fear that their fragile, complicated world of work, welfare, school, and parenting may come tumbling down" (p. 175). These barriers suggest that chunking of degrees must be tied to adequate student support services in order to be successful. The results also imply that completing a chunk of a two-year degree may be perceived as less intimidating and more reachable for students with the barriers Kostick identified because a chunk takes less time and money to complete.

Gonzenbach (1993) examined the key factors that influenced the decision of community college students enrolled in an office occupations program to continue their education beyond the completion of an Associate's degree. This quantitative study found a significant relationship between terminating or continuing education and three factors: age, reasons for obtaining an education at a community college, and educational goals. Gonzenbach's (2003) research had implications for the development and implementation of strategies for the successful return of students to complete the next chunk of an Associate's degree.

Jorissen's (2003) study of teachers, who completed an alternate certification program and were still working as teachers six years later, provided a slightly different



glimpse into the factors that may influence student retention. She interviewed six teachers about their experiences in the alternate teacher education program to determine what was most beneficial to them in preparing to be a teacher in an urban setting. Jorissen (2003) used career development theory, as well as research on teacher retention, to highlight the importance of developing competence, new relationships, and a restructuring of identity as critical tasks for those engaged in a career change. The findings of her study, Jorissen concluded, suggested “that the effectiveness of such collaborative models relate to their strength in addressing the developmental needs of individuals navigating a career transition” (p. 48). These findings have important implications when looking at creating pathways through chunking of degrees suggesting that it may be necessary to create opportunities to develop competence through work experience and to develop relationships using cohort groups or mentors to improve retention.

The importance of understanding the factors that influenced whether students drop out or not is critical to the structuring of new instructional designs such as chunking. The student factors affecting retention outlined by these studies supported the importance of developing chunks of two-year degrees that will better serve students and provided suggestions as to what should be considered when designing chunked programs for community college students. These studies also emphasized the importance of an approach in which chunking is just one part of a comprehensive strategy to support students in completing Associate degrees. In designing any program to improve student retention, it is critical to consider the financial and emotional support that students need to be successful. One of the challenges in

chunking degrees that include planned stopouts is how these support structures will continue to be made available and used by students when they are working full-time and not attending school.

### *Institutional Practices That Improve Retention*

Wild and Ebbers (2002) provided an overview of past and current research related to student retention in community colleges as background to a plan for establishing a community college retention program. They reviewed theoretical models of student retention such as Tinto (1975), Astin (1977), and Pascarell and Terenzini (1991), noting that most were developed for a university setting. These models framed retention and persistence in terms of the degree to which students integrated into the college, or the level of involvement the student has with peers or faculty. Wilder and Ebbers (2002) noted the difficulty in translating these models from the residential university setting to the community college and suggested that research adapting these models to the community college setting needs to be done.

The four studies reviewed below give a sense of the variety of students and student goals among those attending community colleges, illustrating the challenge of developing successful retention strategies to meet differing student needs.

Gonzenbach's (1993) study, described in the previous section, provided important information on several issues that may impact the chunking of professional-technical programs such as the role of student advising using labor market information and employment projections. When chunking professional-technical programs, it is important that the design is based on high-demand occupations that will lead to employment for students, and that students are exposed to labor market and

employment information so that they can make sound education and employment choices. Gonzenbach also recommended that personal, educational, financial, and familial factors should be considered when advising students about education and career choices. She found that educational goals were the most critical factor in whether students continued their education beyond the Associate's degree.

Unfortunately, Gonzenbach provided little detail to illuminate what specifically is meant by the term "educational goals." She also found that age, employment status, and race do have an impact on continuing education beyond an Associate's degree. Thus, when chunking a 2-year degree, it is important to assess the student groups that will most likely be served by this practice and to understand the unique student factors that may impact the student's ability to successfully complete each chunk, as well as the entire degree.

The previous section described a study by Jorissen (2003) which identified, from her analysis of in-depth interviews with six teachers who completed an alternative teacher pathway program, that integration of program components and the resulting development of a sense of confidence and competence were perceived by the study participants as key reasons influencing their decision to remain in teaching. This integrative process involved observation, practice, mentor feedback, and application of feedback in a variety of learning environments including supervised practicum. Jorissen's is one of the few studies that comments directly on instructional strategies that may improve retention, a key purpose in my study of chunking.

Truesdell (1996) looked at the experiences of community college students in Oregon who completed a bachelor's degree, but had not intended to transfer to a four-

year institution. Many of her findings related to the institutional factors that can assist, hinder, or deter students from completing a degree or transferring to a 4-year university, and are significant when devising ways to create viable pathways to degree completion. Truesdell reminded us that “from the student’s perspective, the degree is tangential to the objective, which is economic or social development based on life experience” (p. 78). Truesdell found that many students created their own educational packages based on their personal needs and experiences, as well as on the official information available to them, and that student decisions along the educational journey are, therefore, made in a non-linear manner. “The climbing of stairs and the stopping at floors over a longer period of time deviates from a linear model of education which is based upon a continuous movement...” (p. 79). She concluded that quality information and supportive faculty can facilitate a “sense of connection and clearly outlined next steps” that are critical to students at key transition points (p. 82). What is not clear from the study is how the two key elements she found that impacted successful student transitions - quality information and a supportive faculty – can be developed and nurtured at the community college. The implication for my study was to consider the role of supportive faculty, and the development and communication of quality information, since they were key elements in successful student transitions.

McConnell (2000) examined the literature on first-generation community college students to identify ways that community colleges can assist these students to be successful. McConnell reported that job-related skills tied to specific occupations and finishing a program of study quickly are both important to first-generation college students (p. 77). She also suggested that the formation of learning communities may

address some of the personal and social issues that negatively impact retention of first-generation students. Unfortunately, McConnell doesn't define the term "learning community" which is a weakness of her research. Generally, learning communities refer to a cohort of students enrolled in two or more classes that are linked or clustered around an interdisciplinary theme (National Learning Communities Project, 2004).

Chunking professional-technical programs might be one way to provide students with job-related skills in a shorter timeframe, yet encourage students to return to complete the next portion of a degree and secure greater economic benefits. McConnell's review of the literature related to first-generation community college student retention provided some hopeful indication that compressing degree programs into shorter chunks may improve retention for these students. The strategy of chunking, combined with other instructional support structures such as learning communities, was an intriguing way to balance the student's interest in short-term training with the need for structures that connect the student to the institution.

#### *Summary of Literature on Retention, Persistence, and Completion*

In reviewing the literature on student retention, persistence, and degree completion, I viewed relevant literature as that which identified characteristics common to community college students, as opposed to university students, and which had implications for the chunking of degree pathways as an option for helping these individuals overcome their real or perceived barriers to degree completion. Although there were some suggestions on programmatic or curricular practices that could impact student retention, persistence, and degree completion, little data was available. However, I selected three recent studies, reviewed above, to give a sense of the range

of studies on this topic, the variety of students studied, and the focus on professional-technical programs. Retention, as defined by Summers (2003) and Wild and Ebbers (2002) in a community college context, included completion of a degree within a specified period of time, as well as continuing enrollment, and persistence toward the student's self-defined educational goals. Barriers to enrollment included the demands of parenthood and employment, lack of support from spouses, poor information about financial aid and inflexible financial aid rules, and negative beliefs about the ability to succeed in or afford college (Kostick, 2001). Characteristics of community college students included being the first person in a family to attend college, being more likely to belong to a racial or ethnic minority group, and being more often academically unprepared for post-secondary education (McConnell, 2000; Summers, 2003; Wild & Ebbers, 2002). Advancing beyond an Associate's degree depended significantly on the students' age, their reasons for obtaining an education at a community college, and their educational goals (Gonzenbach, 1993). The findings indicated the importance of supportive environments and counseling to help set educational and career goals, but little research tied to the structure of how degree programs are offered has been done.

#### Pathways and Chunking in Education

Recognizing that few working adults complete long-range degree programs and often leave without any credentials, some community colleges are redesigning credential and degree programs into short-term modules that are organized around specific employer skill needs, are linked to employment, provide credentials, and can be used as building blocks to complete more advanced certificates and degrees. The goal is to develop intensive short-term programs that working adults can complete and that lead to better employment – and that provide a pathway to advancement rather than a final destination. (KnowledgeWorks Foundation, 2003)

The quote above comes from a review by the KnowledgeWorks Foundation (2003) of the role Ohio's community colleges play in educating low-wage workers, and concisely describes the reason why so many colleges are looking at pathways and chunking to better serve their communities. Research on pathways in education was directly relevant to the topic of chunking because chunking, as it was defined in my study, is one of the major components in building effective educational pathways to degree completion. I examined existing pathway programs in community colleges and other educational institutions, and gathered information that can be applied to the practice of chunking professional-technical degree programs. Teacher preparation programs were examined, as one example of a pathway programs, because substantial research exists demonstrating best practices and effectiveness in this area. The development of career academies and pathways in secondary education was also examined for relevant information that guided my research. Research on the integration of academic and vocational education as a way to build coherence in postsecondary education was reviewed, and it demonstrated the added benefit of creating pathways for students. Finally, I explored community college pathways as they related to the practice of chunking, particularly those that target low-wage workers. The results of reviewing other pathways programs was used to demonstrate the effectiveness of pathway programs, as well as the lack of research into the chunking of degrees into smaller subsets for the purpose of encouraging degree completion.

### *Teacher Pathway Programs*

Teaching preparation programs were examined as a one model of a pathway program that has substantial research literature describing various types of pathway programs and their effectiveness. Programs targeting special populations such as those who want to be teachers have developed pathways to encourage student retention and degree completion (Clewell & Villegas, 2001; Haselkorn & Fideler, 1996; Recruiting New Teachers Inc., 2002). While these pathway programs were not planned to accommodate stopouts such as those employed when chunking degree programs, they did offer valuable suggestions for improving student retention and completion through the use of pathways to degree completion. Stopout was a term used to define a point at which a student left the community college before completing a degree or certificate, but returned at a later date (Bailey & Kienzl, 1999). The role of community colleges in creating such teacher pathways was a topic receiving increasing attention because of the role of community colleges in educating large numbers of students who plan to be teachers, particularly minority and second-language students (Bragg, 1998; Center for Community College Policy, 2003).

Bragg (1998) reported on findings from an initiative sponsored by the National Science Foundation and the Virginia Urban Corridor Collaborative for Excellence in Teacher Preparation that brought together representatives of two-year colleges, four-year universities, government agencies, professional associations, and school systems, as well as students. Among the findings were that many community college programs focused on paraeducator and bilingual and minority teacher preparation and tended to have support structures and financial assistance built into the program design.



Townsend and Ignash (2003) explained that community college alternative teacher certification pathway programs reached more nontraditional students who were likely to be older and to be people of color. They concluded that the supportive environment of the community college, along with the cohort model often used in teacher programs, could be effective in increasing the retention of students and the completion of an Associate's degree.

Clewell and Villegas (2001) described a teacher pathways model operating in 42 sites across the United States which

is based on the conviction that nontraditional candidates already have a wealth of experience that, with appropriate support, college degrees, and teaching certificates, will permit them to become full-time teaching professionals with bright futures in elementary and secondary public education. (pp. 7-8)

They reported that the type of program model varied tremendously among paraeducator-to-teacher programs. Some offered only financial assistance such as scholarships, while others offered comprehensive services including tutoring, mentoring, and counseling. Many were designed as cohort programs, so that paraeducators developed a sense of community to support their educational and career goals.

Eubanks (2001), Genzuck and Baca (1998), and Haselkorn and Fideler (1996) identified significant challenges that students in teacher pathway programs face such as financial constraints, educational readiness, family considerations, time commitment, and institutional barriers. Common program features that assisted students in completing a degree and successfully transitioning into a four-year institution included strong partnerships, flexible admissions policies, curriculum fitted

to student needs, comprehensive academic and social support, and tuition or financial assistance.

The work of the above authors was mostly descriptive in nature and focused on programmatic best practices, rather than the systematic collection and analysis of data that defines most academic research. For the current review, this information was helpful in identifying general trends and direction in the area of pathways to degree completion, and in highlighting the need for more in-depth and systematic research in areas outside teacher preparation programs. Little attention was focused in these studies on innovative curricular strategies such as chunking which might improve retention and completion, or on how these types of strategies could be integrated with student support and remedial education.

Hudson (2000) conducted a national study of community college programs that provided a pathway to completion of an Associate's degree and eventual completion of a baccalaureate degree and teaching certificate. The purpose of Hudson's quantitative research was to "determine and describe the role of community colleges in recruiting and developing new teachers" (2000, p. II). A survey was sent to more than 1,500 community college representatives, with 205 surveys returned and analyzed.

Highlights from the surveys of community college teacher pathway programs, reported by Hudson, included higher transfer rates to four-year institutions, an increased number of students of color, and a higher percentage of schools employing some type of practicum experience. Barriers to program and student success were identified, which included tuition costs and other financial pressures on students, as

well as work and family obligations. Hudson's research identified 39 high transfer programs (those having transfer rates over 50% from community college to university) and institutional, curricular, and student services characteristics that occurred at a higher incidence than low transfer programs. Additional research was planned by Hudson that would have included telephone interviews with the heads of the state boards of education and site visits to six community colleges. Unfortunately, the funding for that follow-up research was withdrawn before it could be completed.

The relatively low response rate of 13% is a weakness of the study, but the surveys received represented 46 states and Puerto Rico and included a mix of urban, suburban, and rural community colleges. Since information collected on retention and transfer rates is self-reported, there is some likelihood that the information may be biased by the desire of the survey respondent to have their institution presented positively.

Of particular significance, considering the focus of my study, were those factors related to curriculum and instruction such as the integration of program components, curriculum fitted to student needs, and institutional or programmatic practices which were designed to form a coherent whole to support students through their coursework and assist them in balancing their personal lives with the demands of work and school. Other factors which were identified, and may be related to degree completion, pathways, and chunking of curriculum included student support structures, financial assistance, and cohort building designed to create a sense of community for students.

### *Pathways in Secondary Education*

Pathways in secondary education are relevant to any discussion of chunking in community colleges because the goals are practically identical – the completion of an Associate’s degree and development of work-related skills. The elements that make pathways in secondary education successful provided promising lessons when considering the creation of pathways in community colleges. Secondary education pathways provided a structure that guided curriculum and instruction, as well as partnerships with business that lead to work experience opportunities for students. The model also supported innovative scheduling of courses, and the development of learning communities which support contextual learning. All of these factors could be adapted to chunking for the purpose of creating pathways at the postsecondary level.

Since the mid-1980’s, many high schools have embraced the idea of embedding career-technical education into the academic secondary school curriculum for the purpose of creating opportunities for high school students to acquire work-related skills and an Associate’s degree (Hull, 1993). This array of programs and services is referred to as Tech Prep. One aspect of Tech Prep has been the development of career academies, in which academic and occupational education are integrated around a general career theme such as health care. Hull (2003) identified curriculum frameworks in career academies that outline course sequences, postsecondary credit requirements, and industry certification standards as a way to give students a career pathway that provides a sense of direction with maximum flexibility.

Mittelsteadt and Lindsey Reeves (2003) reported on the results of research on career academies in Philadelphia and California. In their review, they identified three main elements that contributed to the success of career academies: “the integration of academic and technical courses in a real-world context; business support; and the small learning environment” (p. 39). Mittelsteadt and Lindsey Reeves also identified common components of successful career academies that may be directly applicable to chunking professional-technical programs because the goal of the career academy was to create a pathway from high school completion to college completion. These components included scheduling systems that allowed students to move together in sequence, the inclusion of broad-based career themes, and a format that integrated academic and career-technical education in coordinated scheduling blocks. They reported that the value-added of career academies was not in the specific skills taught, but in the “unconventional style and method of education which emphasizes teamwork, continuous peer and teacher feedback,” as well as regular connection with employers “in a safe, personal, and highly structured environment” (p. 39).

Career academies in high schools throughout the United States have been the subject of research conducted by the Manpower Demonstration Research Corporation (MDRC) since 1993 (Kemple, 2004). Student applicants were randomly assigned to either a career academy or a non-academy control group. Kemple reported that career academies could serve as an effective pathway to postsecondary education, but that students in academies were not necessarily any more likely to enroll in and complete postsecondary education than students in the non-academy group. Both groups showed a higher percentage of students enrolling in postsecondary education than the national

average, however. Interestingly, young men in the study had increased earnings of 18% over the non-academy group, while young women in the academy group showed no significant difference as compared to the non-academy group. Kemple contended that young women in the study had a lower rate of increased earnings because they were more focused on attending postsecondary education than securing employment.

For students most at risk of dropping out of high school, academies actually reduced enrollment in postsecondary education. However, the difference between the two groups was not statistically significant – 40% of the academy group completed or were still working on a postsecondary credential compared to 49% of the non-academy group. There was a substantial increase in employment and earnings for the career academy students most at risk of dropping out of high school (Kemple, 2004). Kemple reported that one implication of his research was that teaching occupational skills related to employment need not be done at the expense of enrollment in postsecondary education.

Based on the research reviewed, career academies are an effective way to increase retention, employment, and earnings for students who are likely to drop out of school. In my study, I examined some of the successful strategies used by secondary career academies to determine whether community colleges are employing similar strategies in chunking to create pathways to degree completion.

Stone and Aliaga (2003) used the 1997 National Longitudinal Study of Youth to better understand the extent to which students were participating in Career and Technical Education (CTE) and the characteristics of students who participate. In their report, Stone and Aliaga provided a cogent definition of career pathways, and the

common characteristics of pathway programs: “*Career pathway or career major* are coherent sequences of courses or fields of study that prepare a student for a first job. These career pathways or majors contained elements such as integrated curriculum, work-based learning, and linkages to community colleges and universities” (p. 10). The definition was very similar to my definition of chunking given previously. Stone and Aliaga found that career pathways were associated with a number of positive outcomes. A career pathway “has a significant impact in high school achievement and students in career pathway took more science and CTE classes” (p. 24). However, Stone and Aliaga also found that females were underrepresented in CTE, blacks were overrepresented in CTE and dual concentrations, and Hispanics were underrepresented in CTE, dual, and academic concentrations. In chunked programs, as in other professional-technical programs, it is important to recognize the influence that gender, race, or ethnicity may have on the selection of a career pathway, and to ensure that student advising is based on factors such as student interest, aptitude, and labor market projections.

#### *Integration of Academic and Vocational Education.*

Much has been researched and written on the importance of the integration of academic and vocational education for the purpose of building coherence in postsecondary education, better preparing students for the world of work, and engaging students with applied academics and contextual learning (Genzuk & Baca, 1998; Grubb, 2001; Prentice, 2001). The hope was that integration would not only improve student retention, but would produce citizens able to apply what they know and adapt to new situations. From the literature on the integration of academic and

vocational education, support for pathways that better allow students to visualize the road to degree completion and future employment has developed.

Grubb (1996a; 1996b; 2001) has written widely on the topic of vocational education and the need for the reintegration of job training (typically short-term, non-credit) and education (credit programs culminating in a credential). Grubb introduced the concept of pathways as a way to encourage the movement of students from short-term, non-credit programs into degree or certificate programs – “programs of increasing complexity could be connected in ladders of opportunity, with an individual attending one or two short job training programs and then, as time and employment demands permit, transferring into related certificate and associate degree programs in community colleges or technical institutes” (Grubb, 2001, p. 36). Grubb used the term “ladders of opportunities,” taken from the School-to-Work Opportunities Act of 1994, as well as “vertical ladders” to describe this sequencing of courses into a hierarchy of credentials leading to degree completion (Grubb, 1996b). He did not use the term chunks, but described a “series of sequential education and training-related activities that individuals can use to progress from relatively low levels of skills . . . to higher levels of skills and (presumably) more demanding, better-paid, and more stable occupations” (Grubb, 1996b, p. 124).

Prentice’s review of the literature on the integration of academic and vocational education reported on the efforts to integrate academic and occupation education as a result of the 1983 report, *A Nation at Risk*, “which criticized occupational education for focusing students too narrowly on low-skill, entry-level jobs” (Prentice, 2001, p. 80). Prentice suggested that three strategies were most



frequently implemented at community colleges: the infusion of academic modules into vocational education courses, applied academics in which abstract concepts were applied to concrete vocational examples, and learning communities where students were enrolled in more than one class and teachers collaborated to provide better relationships between subject matter. While not specifically about pathways, Prentice's review of the advantages of integrated academic and occupational education provided principles that can be adapted to the creation of pathways utilizing curricular innovations such as chunking.

### *Community College Pathways and Chunking*

In this section, research related to the concept of chunking to create educational pathways to degree completion in community colleges is examined. In looking at chunking in education, it was important to examine the research on effective methods for introducing these types of curricular changes, as well as those that integrate remedial, academic, and occupational education, along with student support services – all essential components of a two-year degree. This section begins with a general discussion of pathways and chunking in community colleges, followed by an examination of three research studies relevant to pathways and chunking.

Much of the literature about pathways and chunking came from recognition that new ways must be found to address the needs of the large number of students who do not successfully complete a credential. This includes working students, students with low basic skills, low-income students, and students of color. These are the groups that are most likely to drop out of school before completing a credential, but also derive substantial economic benefit from degree completion (Kazis, 2002). However,

Jacobs (2003) reported that one of the critical challenges for community colleges is to avoid creating isolated programs serving only special populations. He argued that promising practices should be embedded into regular activities, institution-wide, not set apart as boutique programs for second-chance students only.

Jenkins (2003) explained that small modules or chunks leading to recognized credentials are a key feature of career pathways that will enable students to secure “better jobs and higher levels of education and training” (p. 1). A study released by the Workforce Strategy Center (Mazzeo et al., 2003) of five community colleges supported the need for the establishment of pathways in community colleges, as well as the creation of new curricular and programmatic structures such as chunking:

New economic realities have created a need for workforce and education policies that better meet employer demands for skilled workers and the needs of workers for economic self-sufficiency. To address these demands, there is growing evidence that workforce and education systems should be reorganized around “career pathways” that integrate education, training and work and are targeted to high wage, high demand employment. Central to the career pathways model is the development of clear connections, or bridges, between basic skills development and entry-level work or training in high wage, high demand career sectors. (p. 1)

Findings from this study of community colleges which have developed new methods to serve students lacking academic skills included integrating developmental and academic content in a contextualized fashion, maintaining close connections with employers, developing new curricular materials, creating opportunities to help faculty learn to teach in new ways, finding resources to maintain these efforts, and promising employment outcomes for students. The curriculum was intended as a bridge for community college students who lacked college-level academic skills, but were interested in professional-technical education. The bridge curriculum allowed students

to increase their academic skills while also learning vocational skills. Unfortunately, the study did not include a cross-case analysis, so it was impossible to determine what specific components of a pathway program were in place at each college, and the effectiveness of those components as compared to other colleges.

Other research focused on creating opportunities for low-income adults to advance economically (Poppe et al., 2004). The report examined research on the experience of low-wage workers and on the types of education and training strategies that have been successful in job advancement. Poppe et al. (2004) also examined best practices from workforce development practitioners to highlight the key elements that lead to career advancement, with particular attention to career pathway models.

The report also indicated a common mistake among workforce development programs, even those within educational institutions, was to create non-credit technical training designed to move low-income people into jobs as quickly as possible. The problem with using non-credit training only was that the individual student makes no progress toward completing a recognized credential and does not reap the economic benefit of degree completion. The study found that one of the most critical factors related to increased wages and job advancement was postsecondary education or training. Poppe et al. (2004) recommended two strategies directly related to chunking: compress existing long-term occupational certificate and degree programs into short, intensive ones so that low-income people can enter training year-round and complete it quickly; and divide training into “chunks” that can be completed at different points in time.

The study reported that many community colleges across the country were redesigning curriculum into smaller sets of courses that can be taken non-sequentially, but linked to a credential. This practice of chunking is related to a larger set of features that define a complete career pathway system. This focus on a systemic approach was significant to my research focus, since it appeared that chunking of curriculum should not be done in isolation, but rather, should be part of a well-thought out career pathways system that includes: “bridge programs” to prepare those with low academic skills; support services; job placement services; clearly articulated roadmaps outlining further curriculum chunks; work experience; and college leadership that advocates for these new models.

*Review of Research Studies Relevant to Pathways and Chunking in Education*

What follows next is a selection of recent studies which examined efforts at community colleges to look for ways to better serve students, particularly those who live in poverty. Due to the small number of studies, it was difficult to include much variety. Most were focused on low-income students and workforce development programs. However, one study of a manufacturing career pathway system created by a consortium of business, labor, government, education and community-based organizations was also included.

*Study of manufacturing career pathway system.* A group of researchers worked with a partnership of labor, business, government, education, and community organizations to create a plan for a manufacturing career pathway system (Swinney, 2001). The intent of the research was to develop a plan to prepare a skilled workforce in manufacturing in Cook County, Illinois. The goal of the researchers was to “create a

career path that goes from lower-skill to higher-skill level jobs, and to take into account the areas of overlap that occur as a worker moves from entry-level jobs to more skilled occupations” (p. 15).

Central to the research project was a methodology that used a sectoral focus on clusters that were most likely to account for job growth in manufacturing for Cook County. Three industry clusters ( Food; Printing; and Metals, Machinery, and Electrical) and the key occupations within those industries were identified to begin the process of determining career paths and the ability of the current system to meet the education and training needs of those pathways. They decided to focus on production workers and technicians, rather than management, clerical, sales, or service jobs. The researchers then analyzed the number of new workers needed annually in each industry cluster and arranged a hierarchy of occupational clusters based on jobs requiring similar skill sets. It was projected that approximately 6,200 workers would be needed annually by the 28 industrial segments (out of 129 total) that make up the Food, Printing, and Metals, Machinery, and Electrical (MME) clusters.

The researchers decided to focus most of their efforts on the Food and MME clusters, since other efforts had studied the Printing and Publishing cluster. Using interviews, employer focus groups, mail surveys, secondary research, and a project advisory committee, the researchers gathered information on hiring practices, job requirements, training and workforce development practices, opinions of training providers, and views of skills clusters and career ladders. They also identified the three categories of skills needed by workers: basic skills, employability skills, and technical skills and looked to the local area to determine if training was available to develop

these skill sets. After gathering the data, the researchers conducted an analysis to determine the gaps between what is needed and what currently exists to train manufacturing workers. The primary conclusions from the gap analysis were: there were too many providers of manufacturing training, the curricula were often unfocused, and the programs operated without understanding of or connection to employers, employees, job seekers, or students (Swinney, 2001). Once the gaps were identified, a plan was developed to create a Manufacturing Career Path System that included industry standards, certifications, credentialing, and career paths.

The significance of Swinney's (2001) study was that it included not only educational institutions, but strong involvement of both business and labor. The career pathway system they proposed for the MME cluster was one that provided a clear role for community colleges, employers, and labor organizations. The system grouped "job and skill clusters in the context of a career path as the foundation for the training and education system" (Swinney, 2001, p. 138). The curricula were developed within the context of industry standards, and the instructional outcomes were tied to nationally recognized credentials. Many of the concepts set out in Swinney's study have significant implications for the creation of pathways and the development of chunked curriculum; for example, the idea of connecting chunks and pathways to a cluster of occupational areas analyzed for their growth potential in the labor market. This was also the first study reviewed that made a strong case for the inclusion of both labor and industry in the development of pathways. The one concern I had after reviewing this study was that the role of educational institutions such as the community college in providing instruction was fairly minimal. There was also very little mention of the

challenges that students face in balancing work, family, and school that have been such an important part of other research on pathways and alternative programs (Clewell & Villegas, 2001; Gooden & Matus-Grossman, 2002; Kazis & Miller, 2001).

*Study examining pathways to earning credentials for low-wage workers.*

Several studies were initiated by the Manpower Demonstration Research Corporation (MDRC) under the project title “Opening Doors to Earning Credentials” (Kazis & Miller, 2001). Gooden and Matus-Grossman (2001) conducted 18 focus groups across six community colleges with three groups of low-wage workers: current community college students, former students who did not earn a credential, and potential students who had never attended a community college. Gooden and Matus-Grossman found differences among the three groups. Current students prioritized education over employment by seeking jobs that fit their school schedule and working part-time, instead of full-time. Former students prioritized employment over education, and generally, had higher wages and job stability. Almost all the participants in these two groups had a high school diploma or a General Education Development (GED) certificate. The third group, potential students who had never attended a community college, had less life stability, fewer family relationships, and was not academically prepared to attend college – about half of them had a high school diploma or GED.

Gooden and Matus-Grossman (2001) found that most participants expected a college education to improve their opportunities and set a good example for their children. The researchers found that a complex array of personal, situational, institutional, and external factors explained high dropout and low completion rates. These factors were similar to the ones referenced in the previous section on

persistence and retention, and include some not noted earlier such as domestic violence, discrimination, housing, transportation, peer relationships, physical or mental health, and substance abuse. Gooden and Matus-Grossman identified potential models and ideas for future research such as a student support center which provide all student services in one convenient location; short-term certification programs with flexible modularized classes; and distance learning options that combine technology with on-campus student support.

In July, 2002, Gooden and Matus-Grossman published a follow-up to their 2001 study. What was most significant about this report was that Gooden and Matus-Grossman took the themes from focus groups in the original study, as well as lessons from other research, and suggested some approaches that may improve access, retention, and completion of postsecondary education. They suggested educational, financial aid, student support service, and community partnership strategies. Educational approaches recommended included bridges between noncredit, remedial, and credit classes; nontraditional course formats that included flexible scheduling; and creation of “lifelong learning opportunities” and career pathways (Gooden & Matus-Grossman, 2002, p. ES-5). Specific examples were given of community colleges that have implemented models such as short-term training which earned credit toward a more advanced credential, should the student return for further education. Financial aid approaches included the need for policies and processes that allowed new or expanded aid for working adults and nontraditional students. Student support service approaches included the creation of aggressive recruiting efforts, on-campus child care, one-stop student support centers, and improving the institutional climate to



provide a more welcoming environment for nontraditional students. Community partnership approaches included working with employers, community organizations, and governmental institutions to implement all of the strategies suggested.

*Study of instructional designs in pathway programs.* Kazis and Liebowitz (2003) provided an excellent examination of curricular and program redesign strategies used in community colleges to “speed advancement from lower levels of skills into credential programs and to shorten the time commitment that earning a credential demands of students” (p. 1). They presented a framework for understanding the general approaches taken by colleges for program redesign. These included shortening one- or two-year programs into shorter certificates, breaking a program into modules, making scheduling more flexible, integrating remedial education into occupational or academic programs, and improving coordination and integration of noncredit and credit offerings (p. 3). The goal of all these approaches was to create pathways by making bridges to higher levels of education and career advancement using a series of what is variously referred to as ladder rungs, chunks, or stepping stones.

In examining community colleges, Kazis and Liebowitz identified two kinds of pathway programs: programs for working adults without the necessary academic and life skills to succeed in college, and programs for working adults who qualify for degree programs. They briefly discussed a third kind of program targeting young high school dropouts and noted that the needs and challenges are different for this group, since a seamless transition to college-level work was needed, rather than the ladder or stepping stone approach for balancing work, family, and school. There were some

similarities among the types of programs, but each had unique challenges in implementing strategies to increase student success. Their findings implied that my study of chunking professional-technical degree programs needed to examine whether there are differences between programs that target different student populations.

As was mentioned earlier, 40% of all community college students must take at least one remedial education course before beginning college-level work. “The challenge facing innovative developmental education approaches is not just to raise their own persistence and completion rates but also to be viable ‘stepping stones’ to mainstream college certificates or degrees” (Kazis & Liebowitz, 2003, p. 5). The community colleges that Kazis and Liebowitz studied had programs demonstrating outcomes which allowed students to progress quickly from basic skills to credential programs, improve persistence and completion rates, and increase the number of students successfully entering and completing credentialed programs. These programs shared three similar curricular or design characteristics: 1) contextualized learning strategies that taught basic skills in a “real” world context using career pathways; 2) employer partnerships that involved employers in campus activities and the curriculum; and 3) bridges to credentialed programs through careful alignment of curriculum and outcomes. Kazis and Liebowitz (2003) believed that the most successful programs were a blend of all three strategies, and many examples of community college programs which incorporated these strategies were highlighted in their research.

The next section of Kazis and Liebowitz’ (2003) research examined promising practices in credential programs for increasing retention and persistence of low-wage

working adults. For most working adults who attend college, the completion of an Associate's degree in two-years is unimaginable. "Many who persist enter, exit, and reenter multiple times. Most, however, do not persist and leave without any meaningful certificates or credentials" (Kazis & Liebowitz, 2003, p. 15). Some colleges made it easier for students to complete certificates or degrees in less time through "shorter, sequenced modules that yield interim credentials with value in the labor market" (Kazis & Liebowitz, 2003, p. 15). These modules (or chunks) encouraged students to persist toward degree completion and formed the basis of a career pathway system. The researchers described a number of approaches that shorten, accelerate, or modularize degree programs such as: instruction that embeds developmental skills into academic or vocational "mainstream" courses; flexible scheduling of courses, with an on-line or independent study component; shorter occupational certificates, designed with employers, which link to an Associate's degree; and workplace e-learning programs. One college highlighted increased the percentage of students completing a credential in integrated manufacturing management to 70%, with 67 students completing an Associate's degree for a degree completion rate of 58%. Generally, completion rates in vocational programs are less than 20% (Kazis & Liebowitz, 2003).

Kazis and Liebowitz (2003) identified implications important for future research. They argued that the impact of multiple variables such as age, work status, gender, skill level of students, student expectations, pathway development, and instructional practices made it difficult to distinguish the impact of those variables in the programs studied. The last two variables referred to the degree to which an

institution has changed its practices as a result of implementing these new strategies. They discussed the challenges raised by those variables and how they may impact future research and policy efforts. For example, they recommended against a study focused on students with very low basic skills, since the length of time needed to progress to college-level work would be too long. Other areas suggested for future research were the differences in types of industries targeted by career ladder or pathway programs and how those differences may affect persistence and completion.

In describing the challenges associated with the differing work status of students, it was significant for my study to note that the word “chunk” was used to describe shortening instruction into modules that “yield interim credentials and can be combined over time into an alternating or concurrent pattern of schooling and work” (Kazis & Liebowitz, 2003, p. 28).

Finally, Kazis and Liebowitz identified several issues important to consider in evaluating programs such as the ones described in their study. The programs included in their study were designed to improve long-term outcomes of degree completion and career advancement; research examining program outcomes over a longer period of time will need to be done. In programs that combine multiple practices such as ones Kazis and Liebowitz’ (2003) studied, it will be difficult to design research that demonstrates which of the practices are most effective and which may not make any difference at all. Institutional issues such as sustainability, cost, internal collaboration among stakeholders, resources allocated to professional development, institutional commitment, governance, and scale must be examined since each can have an impact on the quality of programs and the ease with which students can navigate a pathways

system. The issues raised by Kazis and Liebowitz (2003) were an important context for framing my study and provided focus for collecting, reflecting on, and analyzing data for my research.

*Study evaluating career ladder program.* An interim report on a study of California's New Visions Program looked at the project's implementation and provided an analysis of students' experiences, as well an assessment of the impact of the programs over a two-year period (Fein, Beecroft, Long, & Robertson, 2003). New Visions' design included a 24-week period of intensive preparatory studies in mathematics, English, reading, computer applications, and guidance at Riverside Community College, followed by a short sequence of credit courses called a "mini-program" which provided training for a specific job. Credits awarded during the mini-program were applicable toward a certificate or degree. "The strategy breaks up longer college programs into a series of segments corresponding to successive steps on the participants' career ladders" (Fein et al., 2003, p. vii). The mini-programs were open to all the college's students, not just those in a special program such as welfare-to-work. The research study employed an experimental design with 1,076 volunteers being assigned to a control or treatment group.

Fein et al. reported that recruitment was one of the most challenging aspects of the New Visions Program and that the college and public welfare staff worked several years to implement a successful recruitment strategy. Strategies employed included home visits, advertisements in local media, on-campus picnics, offering work study positions, and using current New Visions students as recruiters. The partners from the community college and the public welfare agency also had to address their differences

in mission and philosophy - the college traditionally focusing on degree completion and the welfare agency on immediate employment.

The core program moved through coursework in six-week blocks, which allowed new students to enroll every six weeks. Teaching approaches blended group discussion, self-paced work, and short lectures. Two significant issues arose during the core program: counseling staff were overextended due to student needs and difficulties with recruitment; and students' academic skills were lower than expected. Program developers had expected seventh to eighth grade competency levels, but students were closer to fifth through seventh grade levels. However, with a 24-week period to work on basic skills intensively, most students' average mathematics and language skills were at the eighth-grade level by graduation. Forty-two percent of graduates from the Core Program tested at or above a ninth-grade level in mathematics, compared to only nine percent at intake. This reflected average gains of two years for mathematics and one year for language (Fein et al., 2003). Fifty-five percent of the volunteers assigned to the program group completed the 24-week core program.

Fein, Beecroft, Long, and Robertson (2003) reported that the post-core college training was the least developed part of the program at the outset. This seemed reasonable, since recruiting students for the program and improving their basic skills took priority during program start-up. However, it appears from this report that while some mini-programs were created by community and employer demand, the New Visions Program did not fully develop the systems to better extend the program beyond the initial core program. Their research design included site visits, surveys of 684 New Visions participants, analysis of data on participant's educational and

economic outcomes, and in-depth interviews with 29 program participants.

Experiences of students in the 24-week core program were very positive. Students reported that the program staff combined high expectations with support and encouragement. All portions of the Core Program received high marks in helping students improve skills and feel more confident in their abilities. The program also succeeded in creating a sense of community where students felt supported by people in situations similar to their own. After completion of the Core Program, 59% of New Visions students had enrolled in at least one college course. However, many students continued to experience life challenges that made college enrollment difficult. Personal, financial, family, and work issues were the likely reasons for these challenges.

Two years following random assignment, the research showed that more treatment group members (83%) than control group members (51%) participated in at least one education or training activity. The research also showed that New Visions participants had a 56% increase in community college attendance, as compared to the control group members (27%). The researchers also reported an impact on college credits applicable to a degree. The New Visions group earned an average of eight credits during the first two years following random assignment, as compared to two credits for the control group. Unfortunately, the economic impact of the New Visions Program on average number of quarters worked or total earnings during the first 18 months after random assignment was not significant (Fein et al., 2003). However, it is possible that the economic impacts will not manifest until much later, since many participants are still attending school.

Lessons learned as a result of the research included: the feasibility of implementing a program that successfully engages low-income working parents; the importance of collaboration among partners; the significance of aggressive recruitment efforts; and the need for flexible management and adjustments over time. The researchers concluded that an aggressive recruitment effort can achieve good participation rates. Further, they suggested that a supportive environment, customized courses, and intensive guidance maintained high levels of participation. They strongly urged the continued development of the next phase of the program, beyond the Core Program, to allow participants to complete “occupational mini-programs and then move to solid, career-track jobs” (p. xvii).

*Summary of Research on Pathways and Chunking in Education*

From the literature on teacher pathway programs, those factors related to curriculum and instruction such as the integration of program components, curriculum fitted to student needs, and holistic practices designed to provide support to students were directly relevant to the proposed research on chunking. Other important factors relating to degree completion, creation of pathways, and chunking of curriculum were the importance of support structures, financial assistance, and cohort building designed to create a sense of community for students.

Research on pathways in secondary education was relevant in looking at chunking curriculum in postsecondary settings. The potential of an approach similar to the career academy model may be a promising direction to consider in building pathways in community colleges. The career academy model provided a structure that guided curriculum and instruction, as well as partnerships with business that led to



work experience opportunities for students. The academy model encouraged scheduling blocks of courses and the development of learning communities that supported contextual learning. All of these factors may be adapted to chunking for the purpose of creating pathways.

Significant to my research focus were the findings that pathway programs were enhanced by offering “bridged” curriculum that integrates developmental and academic content in a contextualized approach. I also discovered significant differences among researchers over the definition of key concepts such as pathways and chunking. However, I adapted many of the definitions in the related literature as I built a comprehensive picture of chunking. The concepts, definitions, practices, and issues raised in the literature provided a rich context for the formulation of interview questions to collect data. I also discovered models in manufacturing and information technology that were used in discussing pathways and chunking with those I interviewed.

Swinney’s (2001) research caused me to examine in more depth the role of business and labor in the creation of pathways and alternate curricular practices such as chunking. How can we ensure that the education we are providing will lead to good jobs with good futures, unless we determine effective ways to involve employers and unions in the actual design of chunks and pathways?

Gooden and Matus-Grossman (2001, 2002) gave voice to the individuals most likely to pursue an educational pathway through a chunked curriculum. The implications outlined in their study were directly relevant to the research questions developed for my study. In particular, the educational approaches such as bridges

between noncredit, remedial, and credit classes; nontraditional course formats to support flexible scheduling; and creation of career pathways informed the development of interview questions for my study.

Kazis & Liebowitz (2003) work established an excellent basis for the research I undertook. Their work began to identify some of the troubling issues involved in creating pathways to degree completion. An area that was also significant for my study was the challenge of the starting point and length of the pathway. During my interviews, I considered the impact if the full pathway had not yet been developed or clearly articulated to the students. I also questioned whether the length of the pathway matters in terms of persistence and completion.

The New Visions study provided a glimpse into a program that had begun the process of creating pathways through chunking degree programs. The difficulty encountered in recruiting enough students to participate was a unique problem not identified in the earlier literature reviewed. It also highlighted difficulties in developing the next step in the pathway, because the study suggested, recruitment was more time consuming than originally anticipated, and the 24-week core program consumed most of the available staff time.

### Summary of Related Literature

In my review of the literature, I examined research relating to student retention, persistence, and completion, as well as educational pathways and chunking. From this review, it was clear that a variety of personal, educational, financial, and institutional factors influenced whether a student completed a degree. These factors included working full-time, attending school part-time, registering late for classes,

lack of specific educational goals, performing poorly in classes, and failure or inability to connect with student support services. Lack of financial resources or family obligations were also identified as factors negatively impacting degree completion.

These factors are complex and it is difficult to analyze their interrelationship, but perhaps equally as important as these barriers to degree completion, was the ability of the student to secure resources when facing these barriers. If a student did not know about or was reticent to engage in student support services, the likelihood of the student dropping out increased. The unique characteristics of community college students and the factors that influence whether they drop out or not need to be understood for chunking to be a successful strategy in helping an individual student successfully complete a degree. In designing methods of gathering data for my study, I attempted to gather information which would reveal successful strategies to make chunking more likely to be successful in the context of the above findings.

The relevant literature was quite consistent in revealing several factors important to chunking professional-technical programs such as integration of program components, curriculum fitted to student needs, cohort and other support structures, and practices that develop a student's sense of competence. When chunking professional-technical programs, it was important that the design be based on high-demand occupations which lead to employment for students, and which expose students to labor market and employment information so that they can make sound education and employment choices.

Chunking should not be done in isolation, but should be part of a well-thought out career pathway system that includes: "bridge programs" to prepare those with low

academic skills; student support services; job placement services; clearly articulated roadmaps outlining the next chunk; work experience; strong partnerships with business and industry; flexible admissions policies; curriculum fitted to student needs; comprehensive academic and social support; tuition or financial assistance; and college leadership which advocates for these new models. It may be that these support structures and connections between chunks are as important as the chunks themselves in helping students complete an Associate's degree.

In reviewing related literature, it became apparent that little actual research into the practice of chunking had been conducted. Most of the literature was more exploratory in nature, rather than analyzing existing practice; and pointed to chunking as a possible solution to improving degree completion and securing better employment opportunities for community college students. However, there was little specific information on what chunking looks like in practice, what issues need to be resolved, and what guidelines are used in implementing chunking. It appeared that chunking of degree programs is a concept that is in its infancy, but that many community colleges were investigating it as a promising practice.

The studies reviewed here provided a solid rationale for a case study approach that explores in more depth the development of pathways through chunking degrees. The literature reviewed relied on focus groups, surveys, interviews, and review of secondary research – all appropriate to a case study approaches. The research reviewed also provided information relevant to the implementation of pathways and chunking that was used in the development of interview questions. One important issue I examined was whether colleges experimenting with chunking were using it

broadly throughout the institution or narrowly in programs serving special populations.

### CHAPTER III - DESIGN OF STUDY

This section describes the methodology of my study and the rationale for this approach, background information that led to my decision to choose this approach, the data needed, information regarding the selection of study participants, data collection and analysis procedures, strategies to ensure the soundness of the data, and approach for the protection of human subjects.

The purpose of my research study was to explore the development of a relatively new practice in community colleges – the breaking apart of degrees into smaller chunks to promote degree completion. My research was intended to assist in identifying and resolving issues associated with chunking, as well as develop guidelines that promote chunking and provide tools that will aid in chunking degrees to foster pathways to degree completion.

#### Methodology and Rationale

I chose a qualitative (also known as post-positivistic or interpretive) methodology for my study for several reasons. A qualitative approach is most appropriate when studying a new or emerging phenomenon or concept (Creswell, 2002). Chunking is such a concept; much of the literature reviewed does not examine this practice specifically, but hints at it as a possible method to improve retention of students, particularly low-income and other underserved populations. Carr and Kemmis (1986) suggest that an interpretative approach may influence practice by changing the way practitioners understand a given situation. I chose this approach because I believe research can be useful to practice and I hope that my research will

promote new and more successful ways to structure degrees in community colleges that will improve access to education and completion of degrees.

Qualitative research has evolved from multiple disciplines such as ethnography, sociology, psychology, history, and anthropology and an interest in understanding phenomenon in a deeper, more holistic way. This holistic understanding of the case event or process and the context in which it occurs has become one criterion for establishing the “truth” of the knowledge produced in qualitative research. Understanding is demonstrated through description, analysis, reflection, and interpretation which reveals the authenticity of the data and allows reconciling of the whole and parts (Patton, 1990; Stake, 1995).

Even though qualitative research methods eschew belief in researcher objectivity or universal truth, there is a strong belief that the “truth” of the knowledge produced by qualitative methods must meet certain criteria such as the usefulness and relevancy of the knowledge produced. The research results must be credible, plausible, and coherent. The researcher must demonstrate they have a holistic understanding of the case studied, and its context and complexity. They must admit bias and show development of specific strategies to limit its impact on the research (Carr & Kemmis, 1986; Creswell, 1998; Gall, Borg, & Gall, 1996; Patton, 1990).

The actual research method I utilized was a case study approach, specifically an instrumental case study. Case study research is concerned with the study of a “bounded system” with the focus being either a case or an issue that is demonstrated by the case or cases. Stake defines an instrumental case study as one where the case is used to gain an understanding of something else (1995). In this situation, a case study

approach allowed me to conduct a detailed exploration to understand chunking, suggested guidelines and strategies that can be modified and applied in community colleges, and led to areas for future research. The research questions for this study were concerned with the issues involved when implementing chunking. A concern with issues is the dominant feature of an instrumental case study (Stake, 1995).

The strengths of a qualitative approach include the richness and depth it provides to the research, and the ability to attract more readers because of its less formal and statistically focused approach. Qualitative research relies on a more balanced relationship between researcher and participant – a distinct advantage in an exploratory study where I hoped the participants would see themselves as partners in the research to help create a workable model of chunking. Qualitative research is particularly useful for exploratory research that attempts to discover themes and relationships – another good match for my initial research on the phenomenon of chunking (Carr & Kemmis, 1986; Gall et al., 1996).

However, there are limitations to qualitative research, in general, and case study research, in particular. Qualitative or interpretive research does not critically examine and challenge the status quo and look at broader social issues such as racism, classism, sexism (Carr & Kemmis, 1986). The effects of racism, classism, and sexism may have a great impact on the ability of community college students to successfully complete degrees and pursue career opportunities. It is my hope that the research I conducted will increase dialogue about strategies such as chunking that will aid those students most likely to be impacted by racism, classism, or sexism in education and employment. The qualitative or interpretive approach may also have unintended



consequences or ramifications that the researcher does not intend (Carr & Kemmis, 1986). The researcher may have an undue influence on the participants, particularly since the researcher is often active in the research setting as a co-participant.

Researchers employing case study can also succumb to a tendency to produce a report that may be judged “too lengthy, too detailed, or too involved for busy policymakers and educators to read and use” because of their interest in providing rich description and analysis (Merriam, 1988, p. 33). On the other hand, case study researchers may err in implying that a case study depicts the entire whole, which can lead to oversimplification or exaggeration of actual events (Guba & Lincoln, 1981). Since the primary instrument in case study research is the researcher, all research results are filtered through the researcher’s values, beliefs, and perspective (Merriam, 1988). This resulting bias can be a limitation of case study research, unless the researcher is aware and communicates one’s personal experiences, values, perspectives, and ways of knowing. However, from a qualitative perspective, this “bias” can also be viewed positively because one’s interests, experience, and the importance with which the research topic is viewed adds richness to the case study. To give some sense of my views, the next section presents a personal disclosure.

#### Personal Disclosure

I chose a qualitative approach because it is in keeping with my own personal worldview, which rests in constructivism, systems theory, and experiential learning theory. These paradigms share some of the same underlying assumptions as post-positivism – the view that reality is constructed, emergent, and constantly changing.

They also hold the view that reality is co-created by those participating, and as such the researcher must remain open to the serendipity of unexpected discoveries.

I am a first-generation college student and struggled to complete my bachelor's degree, and to find my own career path. In 1984, I moved to Oregon from Wisconsin, and worked for almost five years for the state welfare agency. In the context of that job, I began working with community college staff in an employment and training program called Steps to Success. In the community college, I found my life's work – my passion. The programs and students I have worked with – teen parents, welfare moms, dislocated workers, and students of color – convinced me education was the most effective pathway out of poverty. The values and beliefs that drive my actions relate to my own personal and professional experience and include social justice, access, service, inclusion, and equity.

As I thought about a research topic, I reflected on my educational experience and my experience working with community college students such as dislocated workers and welfare recipients who struggle to complete their education and find jobs with good wages, benefits, and a future. For many years, these students have been called “second chance” students and were referred to special programs that often kept them isolated in off-campus locations taking non-credit classes. In the past decade, special programs such as those working with welfare recipients have successfully decreased the number of people receiving welfare benefits. However, there has not been a resulting decrease in the level of poverty. Recently, I have observed community colleges looking for ways to better support these students in accessing and complete a degree. I am committed to creating clear educational pathways for these students so

they can transition from non-credit to credit courses, pursue completion of a degree, and increase their likelihood of securing higher wages and a better quality of life.

### Case Selection

I identified several community colleges that were recognized for development of pathways and chunking through the review of relevant literature, conference presentations, national awards recognizing innovative practices, and conversations with colleagues familiar with my topic. Merriam refers to this as “reputational-case selection” (1988, p. 50). For the purposes of my study, a “case” is defined as a community college which implemented educational pathways to degree completion through chunking in one or more professional-technical programs.

Once potential sites were identified, the list was narrowed down to three community college locations. The reason for selecting three community colleges was a combination that balanced diversity, convenience, and cost. However, Creswell does indicate that a case study researcher typically chooses no more than four cases when conducting a multiple case study (Creswell, 1998). In narrowing down the list of potential candidate sites (cases) for selection, the decision was based on providing enough diversity in the college’s location, size, and type of professional-technical programs to give me a more complete view of the state of chunking in community colleges. Since this is an exploratory and descriptive case study, I wanted to achieve some level of diversity, while still making the research doable in my time frame and financial resources. Once the proposed college sites were identified, administrators were contacted to secure permission to conduct interviews and gather materials related to chunking and pathways.

### Study Participants

Participants interviewed at the case sites included administrators, faculty, and staff engaged in the design and implementation of chunking professional-technical programs to create educational pathways to employment and degree completion. A diversity of administrators, faculty, and staff were interviewed at each site to ensure that multiple perspectives were included, and to improve the likelihood of ensuring the soundness of the data collected. Administrators were identified through a process that included review of relevant materials such as brochures and websites from the selected college sites, initial contact with likely administrators from the college sites, and discussion with colleagues knowledgeable about the sites. The purpose was to identify key administrators responsible for the design and implementation of chunking at the site. These key administrators aided in identifying other important administrators at each of the sites, as well as faculty and staff, who were interviewed. The administrative interviews helped in gaining perspective on why the college implemented chunking and what they saw as the gains and limitations of the practice. They were also interviewed to better understand the systems that were created at the college to support chunking. For example, were changes needed in the college or state data tracking system to recognize students completing a credentialed chunk?

A minimum of three faculty members were selected with the assistance of the key administrators who were interviewed. The interviews were used to develop an understanding of the specific curricular designs faculty members used to implement chunking and to discuss their perspective on the advantages and disadvantages of chunking, and how it has impacted teaching and student learning. Finally, a number of

key staff such as advisors and instructional support staff were identified by administrators and faculty who were involved in both the design and implementation of chunking at each institution.

### Data Needed

I gathered data from three cases. The cases were community college sites which implemented educational pathways to degree completion through chunking. The data collected provided information to understand the context in which chunking takes place, the reason why chunking was implemented, and the experience of the participants involved in its development and implementation. Some interview questions regarding pathways were necessary, in order to understand the context in which chunking takes place. Data collected provided an understanding of the issues or problems that arose in chunking, how those issues or problems were resolved, and what principles might guide the practice of chunking. I felt it was important to understand what issues arose, and how, and by whom, they were dealt with. Data from multiple sources were needed so that the critical themes and issues related to chunking could emerge. In addition to the data gathered from groups, individuals, and documents, a thorough description of the “physical space is fundamental to meanings for most researchers and most readers” (Stake, 1995, p. 63). The goal was to provide a clear understanding of the context in which the data were gathered. This included a description of intangibles such as the organizational hierarchy of the study site, as well as the physical description. It was critical to solicit data that illustrated best practices and guidelines in chunking and to understand the impact that chunking had on the

institution. I developed a series of interview questions to gather information to address the three research questions:

1. What issues need to be anticipated when chunking professional-technical programs?

The first section of the interview questions was designed to inquire about how the program works, what process the participants went through to develop or redevelop the program, and what issues arose during the process. In order to understand the issues that arose when chunking professional-technical programs, it was important to understand the context in which chunking took place, as well as why chunking was chosen as a course of action at each of the case sites. Was there a problem identified that chunking was intended to solve? Did any problems arise in the initial planning or not until implementation? Were there problems in curriculum development? Do students readily enroll in these new program designs or did the college need to communicate the advantages of chunking? Were there any issues with college systems that interfered with the process of chunking? I gathered data to understand what the development process of chunking had been – why it was done, who was involved, what was their role, and what was their experience?

2. How can those issues be resolved?

Once I gathered data on what issues arose during the process of chunking, I needed to understand more about how the issues that were identified were resolved. For each issue, I needed to know what options were considered, how the options were identified, and what were the advantages and disadvantages of each option. Identifying

actions taken to resolve these issues was critically important, as well as who was involved, what role they played, and what was their experience in problem resolution.

### 3. What guidelines should be used when implementing chunking?

In developing guidelines that might direct chunking, I wanted to communicate the impact chunking has had on the college and the individuals who have participated in its development and implementation. Data was needed to identify what worked and what did not work with respect to the issues that arose when chunking. An understanding of what made the chunking process successful was helpful in developing guidelines for chunking. I identified strategies and best practices, in order to develop potential guidelines, and understand the impact of those proposed guidelines.

An informational handout that was prepared for interview participants and copies of the interview protocol are included as Appendix A and Appendix B. The informational handout and the interview questions contain references to pathways, as well as chunking, because it was necessary to understand the larger context in which chunking took place, and because chunking is, by definition, part of a pathway to degree completion. The questions were used as a guide or catalyst during the interviews, and were not necessarily used verbatim, in order to allow the participant to include information they felt was important, but that might not be within the interview protocol. The nature of qualitative research is to remain open that important data may be revealed serendipitously during the data collection process.

### Data Collection Procedures

The major data gathering methods of a case study are observation, interview, and document review (Stake, 1995). These methods provide a range of data that allow reflection, analysis, and interpretation leading to an understanding of the issue of focus – in my study it was chunking. I conducted interviews with participants involved in chunking, as well as others recommended by those participants. Creswell (1998) contends that participants who function as “gatekeepers” can be critical in directing researchers to other individuals who will add important elements to the data collected. Materials such as websites and brochures produced concerning career pathways and chunking were examined for specific data relevant to this study. I also examined other materials such as student handbooks, curriculum guides, and correspondence regarding chunking in order to gain better understanding of the process, procedures, and issues that arose.

The interviews were tape-recorded for later review. Merriam (1988) suggested an interview log as an alternative to a verbatim transcript, which can be both time-consuming and expensive. As suggested by Merriam (1988), I listened to the taped interviews and took notes on important statements or ideas. Direct quotes were written down to be used later in my research report. Part of the log included the exact number of the tape position for all notes recorded, so that I could return to the relevant segment of the recorded interview when necessary. I also ensured that I adequately described the physical location, as well as other important factors such as the participant’s body language and tone of voice.



Field notes were taken to describe meetings or other events that I participated in as an observer. The field notes consist of descriptions of the setting, the people, and the activities. Direct quotations and summaries of what people said during the event were included. Finally, my own commentary allowed me to later reflect on what I was thinking, feeling, and any ideas or interpretations about what I observed (Merriam, 1988).

The documents I reviewed included brochures, web pages, written procedures, student handbooks, newsletters, correspondence, college catalogs, curriculum guides, and schedules – any materials that were developed to explain or advertise chunked professional-technical programs. Merriam argues that documentary data can “ground an investigation in the context of the problem being investigated” and provide a more stable source of data that isn’t altered by the presence of the researcher (1988, p. 109).

#### Data Analysis Procedures

Data analysis was integrated into the data collection process, in order to look for important themes throughout the study and to give the researcher an opportunity for critical reflection on emerging themes. “Data collection and analysis is a *simultaneous* activity in qualitative research” (Merriam, 1988, p. 119). The material collected was organized into files and read thoroughly to look for common elements, troubling issues that need further attention, and to inform the direction of future data gathering. As I moved into intensive analysis of the data, from the ongoing analysis that is part of the research process, I began by reviewing the research proposal to ground myself in the initial research focus and questions.

The data was analyzed using both a within case analysis and a cross-case analysis. First, the data from each college site was reviewed and analyzed, followed by a comparison among each site. This allowed me to look at variations within each college, as well as among the three colleges. Merriam finds that cross-case analysis “differs little from analysis of data in a single qualitative case study (1988, p. 156). Interviews and meeting notes were analyzed to look for common themes related to the research questions. Thick descriptions of the events attended by the researcher were used to gain as much detail as possible about the experience. Given that my topic was relatively new and the practice of chunking was just emerging, I knew it was important to remain open to the possibility that the research questions might need fine-tuning as I gathered and analyzed the data. However, the research questions proved an effective way to gather and analyze the data throughout the research.

The research questions were used to sort the data initially, and then further organize the data under each research question into categories, based on major themes. A running list was kept of major ideas that seemed to cut across the research questions. Categories under each research question were identified by the number of people or the frequency with which something was mentioned in the data, or the importance the participants gave to a particular piece of data, or something that indicated a category that could make a unique contribution to the overall research (Merriam, 1988).

Creswell (1998) referred to data analysis as a spiral that “One enters with data of text or images (e.g., photographs, videotapes) and exits with an account or a narrative” (p. 143). My desired result in this analysis of data and identification of

themes was not only a narrative answer to my research questions, but solid information to guide community colleges in creating career pathways through the chunking of professional-technical programs.

### Strategies to Ensure Soundness of Data and Findings

Triangulation of the data was achieved through the collection of data from multiple participants, as well as the collection of data through multiple methods including interviews, document review, and observation. Triangulation was achieved by looking at the interview responses within each case site and among different sources of data within each site. If discrepancies were found or areas needed further data clarification, then telephone follow-up was used to do some further data collection. Triangulation was employed in two ways - using multiple methods to gather data, and interviewing multiple participants at each site to ensure that the findings draw on corroborative evidence (Gall, Gall, & Borg, 2003). Merriam suggests that “rigor in a qualitative case study derives from the researcher’s presence, the nature of the interaction between researcher and participants, the triangulation of data, the interpretation of perceptions, and rich, thick description” (1988, p. 120).

Triangulation strategies are also a way to demonstrate the soundness of the research results. The findings from each case site were reviewed and analyzed, followed by a comparison among each site. This allowed me to look at variations within each college, as well as among the three colleges. The findings of each research question were compared to look for any discrepancies or inconsistencies that emerged and needed further investigation. The findings were also compared to the relevant

literature to ascertain whether the results confirmed or disconfirmed previous research findings.

### Strategies for Protection of Human Subjects

I completed the National Institutes of Health Human Participants Protection Education for Research Teams online course. The Oregon State Human Subjects policy was followed closely in this research and approval was sought and given by the Institutional Review Board (IRB) before undertaking my study. Informed consent was explained to each participant and a signed copy of the consent form was obtained before conducting any interviews. Administrators, faculty, and staff were identified by their role at the college, and were offered the use of a pseudonym, if they wished. Any direct quotes only identify the participant by their pseudonym, or their role at the college. Special care was exercised in the section reporting on responses to the first research question because it details the problems or issues that can occur when colleges implement chunking of professional-technical programs. In this section of the research results, quotes are attributed only by the category of employee interviewed – administrator, faculty, or staff – in order to ensure confidentiality to the participants. In the remaining sections, when quotes are used, the individual’s professional role at the college is identified. Individual identity of those who participated in the research will not be disclosed. All research results and recommendations were reported in a summarized manner in such a way that participants cannot be identified.

“The best that an individual researcher can do is to be conscious of the ethical issues that pervade the research process, from conceptualizing the problem to disseminating the findings. Above all, the researcher must examine his or her own philosophical orientation vis-à-vis these issues. Self-knowledge can form the guidelines one needs to carry out an ethical investigation” (Merriam, 1988, p. 184).

I believe that the educational experience I've been part of through the Community College Leadership Program has prepared me to be the kind of researcher who approached this study with humility and understanding of the responsibilities inherent in research.

## CHAPTER IV – PRESENTATION OF FINDINGS

This chapter presents the findings from the analysis of data collected in this case study of three community colleges that have implemented curriculum chunking in professional-technical programs. The chapter is organized into three sections. Section one provides an introduction and overview of the findings, and an introduction to each of the three case study sites with detailed information on the programs examined at each college. The first section ends with a table summarizing the information presented on each college. Section two presents the findings as organized by the study's research questions: (1) What issues need to be anticipated when chunking professional-technical programs or degrees? (2) How can those issues be resolved? (3) What guidelines should be used when implementing chunking? The research questions provided a meaningful framework to both analyze the data and to present the findings. Section three is the summary of findings. The qualitative data gathered and analyzed included taped interviews with faculty, administrators, and staff, as well as written and electronic materials.

### Overview of Findings

Participants in my study believed that chunking curriculum to create pathways was an effective way to increase student success and program completion in community college professional-technical programs. Chunking was also seen as a way to reinvigorate the curriculum and to reenergize the faculty, by creating an atmosphere that encouraged flexibility and creativity, as well as building better relationships with, and between students and employers. Thus, it was especially critical that faculty assumed leadership over the changes to the curriculum, and thereby, fully owned the redesigned program. In the programs that were furthest along

in the development of multiple chunks leading to an Associate degree, there was a synergy evident among enthusiastic faculty, dedicated advisory boards, and students - all committed to their profession and their community, resulting in flexibility and innovation demonstrated in curricular design.

The issues that arose, when chunking to create pathways, fall primarily into three areas: student issues; institutional, including staffing, issues; and external issues. Student issues refer to those things which arose from a student's personal situation, and which may in turn prevent successful completion of the chunk being pursued. Many of the issues raised were common to the literature on community college retention and included: lack of basic skills; difficulties balancing work, school, and family life; financial need; and a sense of not belonging in college. Unique to this study of chunking was the problem of students who stop-out for too long after completing a chunk, in that they may risk losing currency of occupational skills and may need to repeat courses.

Institutional issues were those barriers which lie primarily within the local community college's locus of control and included such things as staffing and workload concerns, financial considerations, organizational structure and college systems (e.g., advising, admissions, registration, scheduling), assessment and evaluation, communication and marketing, curricular processes, and assumptions made about chunking and pathways by college personnel.

External issues were those things external to the community college that influenced the colleges' ability to develop, implement, and maintain the chunked curriculum which creates pathways to degree completion. The external barriers which

seemed most problematic were financial aid regulations that prevented students from receiving federal aid in chunked programs, and the study participants' perception that employers did not trust education to deliver on what industry needed.

All of the colleges included in this study developed multiple strategies to address many of these issues. Program orientations, use of cohort groups, mandatory advising by program-specific advisors, written and web-based pathways materials, and special funding designed for students in chunked programs were examples of the strategies used by the colleges studied to address student issues. Strategies used to address staffing issues focused on new methods to calculate workload, rather than the traditional method which relied on number of classes or credits taught. Many of the methods used to resolve the issues identified created better relationships among the internal and external stakeholder groups through the leadership of faculty and administrators. The improved relationships resulted in groups which were more effective in creating and redesigning skills-based outcomes, curriculum and scheduling.

Preliminary guidelines suggested by study participants to aid other community colleges considering chunking included: promote faculty and staff participation in chunking through peer learning, resource allocation, and information and examples to demonstrate how chunking works; select and design chunks that lead to employment within one to three terms, understanding that a single design for all programs is not feasible; utilize existing college structures such as curriculum committees to design and implement chunking; carefully plan course sequencing to ensure that each chunk articulates to the next chunk and the overall degree; implement alternative scheduling



and delivery of courses to allow improved access and flexibility for students; support students in chunked programs by creating structures that build student-to-student relationships, as well as relationships between students and faculty or staff; develop and disseminate information to make the overall pathway, each chunk, and the sequence of courses transparent and easy to navigate; create financial assistance programs specific to chunked programs; ensure adequate connection to the labor market by increasing occupational and labor market knowledge of faculty, building partnerships with key decision-makers in business and industry, and marketing chunked programs as a benefit to business.

### Profiles of Colleges

This section introduces each of the colleges studied and provides information on enrollment, student demographics, and the professional-technical programs specifically included in my study, as well as an explanation of why the college was selected for inclusion. The purpose of this section is to provide the context through which the study was conducted, in keeping with a qualitative research study.

#### *Portland Community College Site*

Portland Community College (PCC) is a multi-campus community college, located in Portland, Oregon - the urban center of Oregon. PCC has three comprehensive campuses and five smaller centers that offer a more limited set of professional-technical and transfer courses, as well as job training. Enrollment (unduplicated headcount) at PCC for the 2002-03 academic year was 101,896 with full-time equivalency at 26,061. Fifty-five percent of students are female and 45% are male. The average age of students at PCC is 36 years. One percent of students are

American Indian or Alaska Native, 4% are African-American, 9% are Asian/Pacific Islander, 12% are Hispanic, and 73% are Caucasian. PCC has a relatively small number of International students – less than 1% of the total enrolled (Portland Community College, 2005).

PCC offers certificates in 51 professional-technical areas, and 58 Associate of Applied Science degrees. The college awarded 413 certificates and 1,447 Associate degrees in 2002 – 2003. The Associate degrees awarded also include those in lower-division transfer disciplines that allow students to transfer to a four-year institution to complete a Bachelor's degree. Four hundred eighteen full-time and 1,216 part-time faculty teach at PCC.

PCC was selected for this research study because of its reputation as an early adopter of pathways, as evidenced by its inclusion in several national publications on pathways. As a large, urban college with multiple campuses, it is also distinct from the other two colleges included in my study, and it was hoped that this diversity would provide a broader picture of the state of chunking in community colleges. PCC's administration has recognized the importance of creating educational pathways for students, so much so that the development and implementation of educational pathways that "offer students multiple avenues to transfer and employment and facilitate student movement toward their educational goals" is a key action area in PCC's Educational Master Plan (Portland Community College, 2004).

In discussion with two key administrators involved in the development of pathways at PCC, the Machine Manufacturing Technology program was identified as an example of a professional-technical program that had "chunked" the curriculum to

create an educational pathway for students. The Machine Manufacturing Technology program is located at the Sylvania Campus of PCC.

The Sylvania campus, pictured in Figure 1, is the largest of the three comprehensive campuses and was the first campus opened in 1968, and is located in a suburban area of Southwest Portland. Total enrollment at Sylvania was 25,047 with a full-time student equivalent of 9,182 for the 2003-04 academic year. The campus is on a spacious, wooded hillside with beautiful views of the surrounding area.



Figure 1. Portland Community College – Sylvania Campus

The Machine Manufacturing Technology (MMT) program, located in the building pictured in Figure 2, was one of the first vocational programs offered when the Sylvania campus opened in 1968. The program prepares students for employment in a variety of Machinist positions such as Machine Operator, CNC (computer-numerical control) Machinist, Computer Assisted Machining Programmer, and

Mechanical Inspector. The program employs four full-time faculty members, as well as a full-time instructional support technician. Most classes and other activities take place in one of three areas: a general purpose classroom, the “shop,” or the resource room. The general purpose classroom is a typical classroom with tables and chairs and seats approximately 25 students. The “shop” is a large area with a concrete floor and filled with a variety of machining equipment such as drill presses, lathes, computers, band saws, and milling machines. The resource center is staffed by the Instructional Support Technician and houses tools, videos, books, and other materials that can be checked out by students in the MMT program.



Figure 2. The location of PCC’s Machine Manufacturing Technology Program.

The MMT program is open-entry, open-exit meaning that students can begin a course of study at anytime during the term and can complete the program at anytime. It is also designed to be self-paced meaning students sign up for courses and come in on their own schedule to complete the required tasks and projects identified with each

course. Each course is modularized based on skill sets identified by industry, and students complete the modules associated with each course. The Shop and Resource Room are open Monday through Thursday from 9:00 am to 9:00 pm, with the Resource Room available from 9:00 am to 5:00 pm on Fridays.

The Division Dean and Faculty Department Chair both reported that the decision to move to an open-entry, open-exit, self-paced model was based on declining enrollment and the concern that the program might be closed if enrollment did not increase. Through the Dean of Instruction at Sylvania, the Division Dean and faculty heard about a manufacturing program administered by a community college in Michigan. In 1996, a team of three from PCC traveled to Michigan to explore the program. When they returned, they decided to implement the same design of an open-entry, open-exit, self-paced model. Faculty members were compensated for the development required with course release time. The faculty changed what had been a six-term course sequence, and broke it down into very small units; some as small as one-credit versus the old model which was 15 credits per term. They allowed current students to finish the program under the old model, so for a while they ran both models concurrently.

The MMT program offers an Associate of Applied Science degree made up of 108 credits, a two-year certificate made up of 90 credits of MMT coursework, a one-year certificate made up of 45 credits of MMT coursework, and a more flexible certificate called an Employment Skills Training (EST) certificate. The EST is a state-recognized certificate made up of between 12 and 44 credit hours. It must be connected to an identifiable job in the labor market and is designed to offer flexibility

for students needing more immediate employment and for employers it is intended to provide a skilled entry-level worker. The MMT program has developed packaged ESTs, but also works individually with students to custom design an EST to meet their needs.

One of the reasons I was particularly interested in the MMT program was the fact that they have successfully blended both the open-entry, open-exit model with a chunked curriculum. I was curious whether this pairing made sense or not and whether it could be or should be adapted for other professional-technical programs. In the MMT program, I interviewed the following five people: two full-time faculty members – one who functions as the Faculty Department Chair; a program advisor who is funded through the federal Perkins Program; an instructional support technician; and the Division Dean responsible for the MMT Program. All interview participants felt that the move to an open-entry, open-exit, chunked program was valuable for students, as well as faculty. The format works well for students balancing work, family, and school responsibilities because of the flexibility the 54 hours of open instruction per week offers. Interview participants also felt that the awarding of certificates for smaller chunks was a motivator for students, and a concrete symbol to employers of skills learned. Faculty also spoke of the advantages of more one-to-one interaction with students, and the resulting satisfaction they felt as they got to know students better.

The most commonly used chunk, the EST certificate, was designed in partnership with PCC's Dislocated Worker Program (DWP). This chunk is a two-term

course of study made up of 26 quarter-credit hours and includes the following courses in the first term:

- MCH 100 Machine Tool Basics – 1 credit
- MCH 105 Blueprint Reading I – 1.5 credits
- MCH 110 Blueprint Reading II – 1.5 credits
- MCH 120 Machine Shop Math – 2.5 credits
- MCH 125 Speeds and Feeds – 1.5 credits
- MCH Basic Measuring Tools - 1.5 credits
- MCH 145 Layout Tools – 1.5 credits
- MCH Precision Measuring Tools – 1.5 credits
- WFTT14 Career Planning – non-credit

In the second term of enrollment, the students select an area of specialization: Manufacturing Technician (14 credits), Mechanical Inspector (13.5 credits), or Sheet Metal Technician (13.5 credits). In addition to the coursework in the second term, the students complete an unpaid internship that provides PCC credit. During the planning phase, the MMT faculty and DWP staff decided that the first term would be a cohort group, and not self-paced, as is the regular MMT program. The intent being to better serve students who were perceived to need more structure, due to returning to school after a long absence or who perhaps had a past negative educational experience. However, during the second term, the students enroll in their area of specialization and follow the open-entry, open-exit, self-paced model. They develop their schedule with the help of the DWP advisor and an MMT faculty advisor.

Besides the faculty and staff of the MMT program, I also interviewed the PCC employee who develops career pathways by assisting professional-technical programs to create short-term chunks that are connected to entry-level jobs. The position is funded by the local Workforce Investment Board out of the federal Workforce Investment Act funds. He was able to provide a larger context for the development of chunks to create pathways from his perspective in working with many departments at PCC and Mt. Hood Community College. I also spoke with several students who were completing one of the chunked training programs at PCC. These one or two term chunks are advertised as “Career Pathways Training” and are marketed extensively to One-Stop Career Centers in the Portland area. The following are examples of some of the professional-technical programs that have been chunked at PCC:

Accounting/Bookkeeping, Criminal Justice and Corrections, Emergency Telecommunicator, and Medical Lab Assistant. All the credits earned in these programs can be applied toward a certificate or Associate degree. An example of the curriculum for the Accounting and Bookkeeping program is shown below. Term one includes the following courses:

- BA 95 Introduction to Accounting – 3 credits
- BA 101 Introduction to Business – 4 credits
- BA 131 Computers in Business – 4 credits
- BA 228 Computers in Accounting (QuickBooks) – 3 credits
- WFTT14 Career Planning – non-credit

Students can elect to continue into a second term that includes:

- CAS 121 Beginning Keyboarding – 3 credits



- OS 131 10-Key on Calculators – 1 credit
- CAS 170 Beginning Excel – 3 credits
- BA 177 Payroll Accounting – 3 credits
- BA 280A Cooperative Education – 3 credits.

The distinction between these classes and the typical non-chunked classes is that these classes are offered in a compressed schedule; typically two classes may be offered over a four to six-week period, followed by the remaining classes. This set of classes is also advertised as a chunk, and students are encouraged to register for the classes as a block.

The Career Pathways Training also includes programs that grant Continuing Education Units or CEUs. These include Medical Coding and Insurance Billing, Phlebotomy, and Pharmacy Technician. The curriculum for the Medical Coding and Insurance Billing is shown below as an example of a CEU program. Term one includes the following courses:

- CEU942Q Medical Terminology 1 & 2
- CEU 942P Basic Coding Classification
- CEU 940 N Insurance Billing and Reimbursement
- WFTT14 Career Planning

An optional Internship that awards six to 16 credits, depending on the number of hours completed, can be taken following the completion of the courses in term one.

Finally, there are non-credit programs for students whose English skills prevent them from enrolling in courses requiring college-level skills, but who seek short-term training that leads to employment. These training programs include Health

Care, Office Skills, and Institutional Food Service. Neither the CEU or non-credit programs articulate to certificate or degree programs at PCC, a weakness recognized, but not yet addressed by PCC. The curriculum for the 15-week ESL Health Care training is shown below as an example of the coursework included. Students spend eight to twelve hours per week in an unpaid internship, and 20 hours in the classroom learning the following skills:

- Microsoft Word and Internet
- Hospital and Clinic Culture
- Medical Vocabulary
- Customer Service
- Workplace Communication
- Safety Procedures
- Career Planning – Job applications, resumes, cover letters, and interview practice.

The data gathered and analyzed at PCC included taped interviews with faculty, administrators, and staff, as well as written and electronic materials. I also photographed the campus and the MMT classroom, shop, and resource room to fully visualize the setting as I reviewed and analyzed the data.

#### *Shoreline Community College Site*

Shoreline Community College (SCC) was established in 1964 and is located approximately 10 miles north of Seattle, Washington. SCC awards transfer degrees which include the Associate in Arts and Sciences and the Associate in Science, as well as professional-technical credentials which include the Associate in Applied Arts and

Sciences degree, the Certificate of Proficiency, and the Certificate of Completion. SCC employs 137 full-time faculty and 214 part-time faculty. Instructionally, SCC is organized into several divisions that include Business, Automotive, and Manufacturing; Health Occupations and Physical Education; Humanities; Intra-American Studies and Social Sciences; Science; and Continuing Education/Extended Learning.

The campus appears smaller than it actually is because of the numerous one-story buildings that weave among tall trees and mossy walkways. The buildings are numbered – Administration is 1000, the Center for Manufacturing is 2500, and so forth. Beyond the traditional classroom and administrative buildings, the campus also houses a dental clinic, a hair salon, and a car showroom. These are all associated with professional – technical programs and give the students an opportunity to get real world experience and provide services to the local community.

Annual enrollment at SCC for the 2002 – 2003 school year was over 15,000 (unduplicated headcount), with a full-time student equivalent of over 5,600. The average age of the student population is 27.2 years. One percent of students are Native American, 4% are Hispanic, 5% are African – American, 6% are International Students, 14% are Asian/Pacific Islanders, 56% are Caucasian. Eleven percent of students did not report or reported something other than the categories included above (Shoreline Community College, 2004b).

I selected Shoreline, pictured in Figure 3, to include as one of the case study sites for a number of reasons. Colleagues that I spoke with at PCC and other community colleges recommended that I consider Shoreline because of its reputation

in creating short-term credentials or chunks. As I spoke with an administrator at Shoreline, she recommended two programs be included – the Manufacturing Technology (MT) and Visual Communications Technology (VCT) programs because it would give me two ends of the spectrum, in terms of chunking development. MT had just implemented its chunked program, and VCT began development of chunks over six years ago. I also thought that Shoreline, being a small, single-campus college, would add to the breadth of my study of chunking among community colleges.



Figure 3. Shoreline Community College Campus.

SCC is a leader in the development and tracking of short-term certificates that allow students to quickly get employable skills. They began this effort in 1999 and have seen over 2,600 students complete a short-term certificate. The Certificate of Completion can be finished in one or two terms and leads to entry-level jobs. It can also be articulated to the next level of certificate – the Certificate of Proficiency, as

well as the Associate degree. Because of this focus on development and tracking of short-term certificates, the number of program completers at SCC has increased dramatically, from 59 short-term certificate completers in Fall of 2000 shortly after this initiative began to 119 a year later in Fall of 2001, and 149 in Fall of 2002.

The two program areas I chose to examine as part of my case study were Manufacturing Technology (MT) and Visual Communications Technology (VCT). The MT program has recently begun offering a chunked program, but the VCT program was one of the early initiators of chunking at SCC. I interviewed two college administrators, the VCT Program Manager, three faculty members, and the Director of Business Services and Special Projects.



Figure 4. SCC's Center for Manufacturing Excellence.

The MT program, located in the building pictured in Figure 4, has been redesigned and reopened after a hiatus of two years, due to low enrollment. However,

SCC was able to secure some additional state funding to redesign the program as part of The Center for Manufacturing Excellence. The original manufacturing program focused almost exclusively on machining, while the redeveloped program boasts that it trains students to work in manufacturing environments from “silicon chips to potato chips” (Shoreline Community College, 2004c). As part of the program reinvention, the curriculum was chunked and modularized, allowing students the ability to complete an array of short-term certificates made up of modularized courses developed to meet industry standards.

The Certificate in Basic Manufacturing was developed with an advisory panel made of representatives from the manufacturing industry and its associations, from community-based groups, and educational institutions throughout Washington. Eight learning outcomes were identified by the advisory group:

1. Work effectively in a manufacturing environment;
2. Use systems to support the manufacturing business to meet the needs of internal and external customers;
3. Participate and contribute to the effectiveness of teams;
4. Apply technology to operate and contribute to business and manufacturing systems;
5. Use basic communication skills (writing, reading, speaking, listening and computing) to meet the needs of the workplace;
6. Gather, interpret, and use data consistently and accurately to make decisions and take action;
7. Contribute to the maintenance of a safe and healthy work environment;

8. Take responsibility for your own actions and decisions, adapt to change, and regularly update your skills, knowledge, and attitudes to meet new challenges. (Shoreline Community College, 2004c)

The Basic Certificate is made up of 10 courses and a total of 17 to 21 quarter credit hours. The required courses are:

- MFGT 090 Orientation – 1 credit
- MFGT 091 Fundamental Personal Skills in Manufacturing: Listening, Observation, Teamwork – 2 credits
- MFGT 092 Personal Skills in Manufacturing – 2 credits
- MFGT 093 Personal Skills in Reading, Writing, Math – 2 credits
- MFGT 094 Personal Skills in Reading, Writing, Math – 2 credits
- MFGT 095 Technology in Manufacturing – 2 credits
- MFGT 101 Health and Safety in Manufacturing – 2 credits
- MFGT 102 Blueprint Reading in Manufacturing – 1 credit
- MFGT 103 Basic and Precision Measurement & Intro to SPC (Statistical Process Control) – 2 credits
- MFGT 110 Capstone Project – 1 to 5 credits

The diagram shown in Figure 5 was developed to provide a visual explanation of the certificate, and is included here as an example of how Shoreline is developing roadmaps of its chunks.

The courses are divided into modules, and students can work at their own pace with instruction available through laboratories, lectures, and online. Beyond the Basic Manufacturing Certificate, development is underway for certificates in Computer-

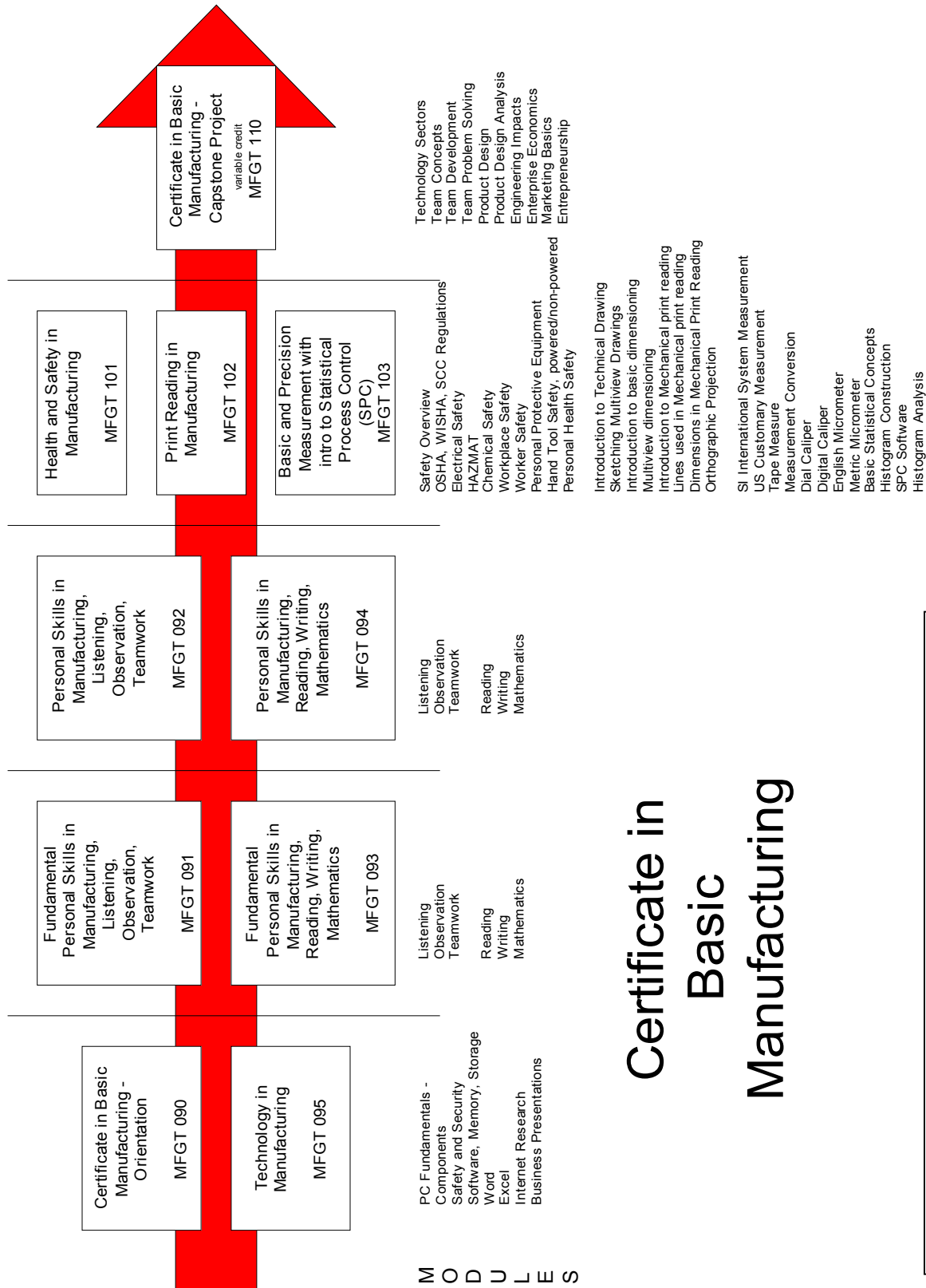


Figure 5. Map of SCC's Certificate in Basic Manufacturing.



Numerical Control (CNC) Technician, Quality Technology, and Manufacturing Processes. The faculty coordinator told me the goal is “certificates of completion that lead to certificates of proficiency that lead to AAAS degrees. The other thing we’re trying to follow is national certifications as part of curriculum development, so that students can be certified.”

The MT Program employs just one full-time faculty member, who also serves as coordinator of the program, but support is also provided from several other faculty and administrators in a variety of instructional areas who serve on subcommittees of the Center for Manufacturing Excellence and assist in the development of learning outcomes and assessment activities. Rubrics have been developed for all courses and all modules within the courses to assess student learning. At the time of my visit to conduct interviews, the program enrollment was small – 12 to 15 students – but faculty and administrators feel confident that the program has the support of local industry and that enrollment will grow.

The Visual Communications Technology Program (VCT), located in the building pictured in Figure 6, is designed to provide an “integrated foundation of knowledge and practice in visual design principles; graphic and typographic design; photography and video; computer graphic technologies; and offset printing, pre-press, and new imaging technologies” (Shoreline Community College, 2004a). Students select an area of concentration such as graphic design, print production, multimedia, or marketing.



Figure 6. SCC's Visual Communication Technology Building.

VCT has well-developed curriculum chunks that allow students to complete short-term certificates that lead to the five AAAS degrees. The five degree options in VCT include Graphic Design, Offset Printing, Digital Photography/Video, Interactive Media, and Marketing. The effort to chunk the curriculum into short-term certificates began six years ago, when SCC received a grant in partnership with the local school district to build a pathway from high school through community college.

Since the VCT program began tracking completers of the short-term certificates in Fall of 2000, 453 certificates have been awarded by SCC in Arts and Design Foundations, Computer Foundations, Computer Graphics Foundations, Print-on-Demand/Offset Printing, and Web Design. Most of the certificates of completion can be finished in one term. However, the marketing of these one-term certificates has been almost exclusively targeted to the area's One-Stop Career Centers and to individuals needing short-term training. The One-Stop Career Center is funded to

provide employment and training services to individuals who are unemployed and underemployed through the federal Workforce Investment Act (WIA).

The VCT Program employs two full-time and eight part-time faculty, as well as a full-time Program Manager who provides initial advising, as well as interface with other departments at SCC, and with community organizations such as the One-Stop Career Centers. Current enrollment averages about 50 students per term, according to the Program Manager.

All the short-term certificate chunks are 20 credits or less, although some have prerequisite courses that must be completed before beginning the certificate. All courses taken as part of the short-term certificate of completion can be applied to the longer certificate of proficiency and to the AAAS degree. As an example, the VCT Print-on-Demand/Offset Printing certificate of completion is one that requires no prerequisites and can be completed in one quarter. The certificate provides skill training in digital printing technology and print-on-demand services and prepares students to be certified through Xerox. Students are prepared to find employment in entry-level positions in print shops, news agencies, and advertising agencies. The certificate is made up of 10 to 13 credits from the following courses:

- VCT 116 On Demand Print IV – 4 credits
- VCT 111 Offset Printing Procedures I – 4 credits
- VCT 212 Internship in Visual Communications – 2 to 5 credits

The certificate of completion in VCT Computer Graphic Foundations prepares students for entry-level positions in desktop publishing, graphic design, illustration,

and editing of visual images. The certificate totals 11 credits from the following courses:

- VCT 131 Computer Graphics: Desktop Publishing I – 3 credits
- VCT 132 Computer Graphics: Design/Illustration – 3 credits
- VCT 129 Intro to Photoshop – 3 credits
- MusTc 105 Rights and Methods in Multimedia – 2 credits

However, this latter certificate contains 14 credits of prerequisite courses including:

- CIS 105 Computer Applications – 5 credits
- CIS 140 The Internet and HTML – 5 credits
- VCT 124 Basic Macintosh Systems Operation – 2 credits
- VCT 124 Intro to Image Construction, Editing & Output – 2 credits

All the required courses, as well as the prerequisites, apply to the certificate of proficiency and to the AAAS degree.

An essential element in SCC's success in increasing the number of program completers and in creating more short-term credentials was the inclusion of administrative support staff who analyzes transcripts to determine whether students have completed the required courses for one of these credentials. Once the student has been identified as a completer, they are contacted by the department and given the opportunity to apply for graduation. They are encouraged to attend SCC's graduation ceremony to be recognized for their achievement. SCC has found that once students became more aware of these certificates, they are motivated by the recognition to pursue more certificates, and faculty has been motivated by the students' enthusiasm

to develop more certificates. An administrator at SCC believes that one unexpected result of creating chunks with a credential included is that more students stay in the program longer. Unfortunately, SCC doesn't currently track whether students return to complete another credential after the initial one.

The data I gathered and analyzed at SCC included taped interviews with faculty, administrators, and staff, as well as written and electronic materials. I also photographed the campus and the specific classroom building that house the MT and VCT programs to fully visualize the setting as I reviewed and analyzed the data.

*Maricopa Community Colleges - Phoenix College Site*

With ten colleges and two skill centers, Maricopa Community Colleges (MCC), in the Phoenix, Arizona area, is one of the largest community college systems in the country. MCC enrolled over 278,000 students in the 2003 – 2004 fiscal year, with a full-time student equivalent of over 68,000 (Maricopa Community Colleges, 2005). MCC is on the semester system, rather than the quarter system as are PCC and SCC.

I selected MCC because of feedback from community college colleagues that MCC, particularly in the health care programs, had created many pathways made up of short-term credentialed chunks. I also thought that a large multi-college system would add to the diversity of options for how chunking might be accomplished. When I spoke with the Director of Maricopa's Health Care Integrated Educational System, she suggested Phoenix College as the college with a group of programs that had well-developed chunks, and an enthusiastic faculty receptive to the focus of my study.

To get a sense of the entire Maricopa system, I began my interviews with the Director of Maricopa's Health Care Integrated Educational System. Maricopa Community Colleges graduate over 3,000 students per year in the health care programs, which include nursing and allied health occupations. Allied health includes programs such as Health Information Technology, Phlebotomy, Laboratory Assisting, and Medical Assisting.

Maricopa, in cooperation with the other community colleges and the Arizona Department of Commerce, commissioned a study of the match between Arizona's demand for bioscience workers and the ability of the educational system to meet that demand. The study found that there was a mismatch between the need for trained bioscience workers and the ability of the secondary and postsecondary institutions to meet that need. This report has driven much of the development and funding of pathways in professional-technical programs in healthcare and science in Arizona's community colleges.

Arizona has an online system to support pathways for students who complete an Associate of Applied Science degree and want to transfer to a university to complete a Bachelor's degree. Arizona has also developed a Bachelor of Applied Science degree which was created specifically for those completing an Associate of Applied Science degree at a community college.

In moving to an integrated, collaborative model, common competencies were identified by the Maricopa colleges, in cooperation with health care industry representatives. These competencies were the basis for the set of core courses that were developed, and that all health care students must complete or must show

competency based on previous education or work experience. The courses can be offered as .5 to 1-credit modules or as a three-credit class and include:

- HCC 130 Fundamentals in Health Care Delivery – 3 credits or can be offered as separate .5 credit modules.
- HCC 145 Medical Terminology for Health Care Workers – 3 credits or can be offered as separate 1 credit modules.



Figure 7. Phoenix College Campus.

My case study then looked specifically at the Allied Health programs at Phoenix College (PC), pictured in Figure 7. Founded in 1920, it is the oldest of the ten colleges making up the Maricopa system. In the 2003 – 2004 fiscal year, PC enrolled over 25,000 students with a full-time student equivalent of almost 7,000. Thirty percent of PC students identify as Hispanic and 35% as Caucasian, with women comprising 57% of student population. The small campus contains many stately brick

buildings, set among palm trees, cacti, and flowering bushes which gives it an old Southwestern look. At PC, I interviewed a college administrator, a Faculty Department Chair, a faculty program advisor, and three faculty program directors. The Allied Health Programs at PC are led by the Associate Dean of Occupational Programs, and by a Faculty Department Chair elected by her peers. Each of the Allied Health Programs also has a Faculty Program Director who oversees a particular subject area.

PC believes that chunking allows more effective communication and marketing to students - telling them that in a short amount of time they can have employable skills, as well as an understanding of the rungs on the educational ladder that lead to career advancement. Completion of a chunk allows students to explore careers by giving them work experience after a shorter period of time. Chunking gives the college an opportunity to examine how faculty develop and deliver curriculum in ways that increase portability such as taking the chunks to the local hospital and providing on-site coursework for employees, giving them a chance to improve their skills and move up the career ladder.

The Allied Health Programs at PC are located in the Science Building, pictured in Figure 8, and enroll approximately 1,000 students per term (unduplicated headcount), which accounts for about 20% of Maricopa's total enrollment in allied health programs. Besides the Associate Dean and Department Chair for Health Information Management, I interviewed Faculty Program Directors in Laboratory Assisting and Histology Technician; Medical Assisting and Patient Care Technician; and Phlebotomy. I also interviewed an additional faculty member who provides much



of the advising for the Health Information Technology Program. While faculty provides advising once students are part of the program, students are initially encouraged to see the designated student services advisor for the health care programs.



Figure 8. PC's Science Building which houses the Allied Health Programs.

The Allied Health Programs at PC fall under two different departments – Health Information Technology and Health Enhancement. The Health Information Technology Programs are designed to meet the labor market demand for technical specialists who demonstrate knowledge of medical terminology and procedures, business applications, reimbursement methods, and health information computer applications. The program offers courses leading to four certificates and one Associate of Applied Science degree. Certificates include Hospital-Based Medical Coding, Physician-Based Medical Coding, Health Information, and Medical Billing. The Associate of Applied Science degree is in Health Information Technology. There is a

great deal of overlap in courses between the four certificates. This makes it easier for students to complete more than one certificate, and all the coursework for the certificates can be applied to the Associate degree.

An additional 19 credits in the following courses (beyond the Health Care Core listed above) are needed for the Medical Coding: Physician-Based certificate:

- HCC 164 Pharmacology for Allied Health .5 credit
- HCC 204 Clinical Pathophysiology 3 credits
- BIO 160 Introduction to Human Anatomy 4 credits
- Introduction to Microcomputers OR Windows 1 Credit
- HIT 180 Introduction to Medical Billing and Reimbursement 2 credits
- HIT 185 ICD Diagnostic Coding 3 credits
- HIT 212 CPT Coding 2 credits
- HIT 214 CPT Coding 2 credits
- HIT 187 Physician Based Medical Coding Seminar .5 credit
- HIT 189 Professional Practice in Physician Based Coding 1 credit

Following completion of the Physician-Based Coding certificate, students can elect to continue their education and complete the following courses for the Hospital-Based Coding certificate:

- BIO 156 Human Biology for Allied Health 4 credits
- BIO 201 Human Anatomy and Physiology I 4 credits
- BIO 202 Human Anatomy and Physiology II 4 credits
- HIT 209 ICD Procedure Coding and Inpatient ICD Applications 2 credits

- HIT 211 Advanced Application of ICD Coding 2 credits
- HIT 215 Hospital-Based Medical Coding Seminar .5 credit
- HIT 216 Professional Practice in Hospital-Based Coding 1 credit

Finally, students electing to complete the Associate degree in Health Information Technology would take additional courses in Health Information Technology, other health-related courses, and some additional general education courses.

The other allied health department at PC is the Health Enhancement Department where I looked at four additional programs: Phlebotomy, Patient Care Technician, Medical Assisting, and Laboratory Assisting/Histology Technician. Each program is designed in such a way that it allows students to complete short-term certificates, or chunks, that lead to an Associate degree. Phlebotomy is the entry for many of the students who enroll in the Patient Care Technician or Medical Assisting Program. The Phlebotomy Program is made up of 7.5 credits and can be completed in eight to sixteen weeks:

- HCC 130 Fundamentals in Health Care Delivery 3 credits
- HCC 145AA Medical Terminology for Health Care Workers 1 credit
- HCE 109 Venipuncture: Basic Skills 1 credit
- HCE 111 Venipuncture: Advanced Skills 1 credit
- HCE 120 Clinical Practicum 1 credit
- HCE 121 Clinical Practicum: Special Processing .5 credits

The Patient Care Technician Program (PCT) is designed for those individuals who are already working as a Certified Nurse Assistant (CNA). The program is

intended to help students move up a career ladder from CNA to PCT to Licensed Practical Nurse to Registered Nurse. Students attend classes from 8:30 a.m. to 5:00 p.m. on Mondays and Tuesdays and complete a total of 10 credits. This allows the students the opportunity to continue working as a CNA. The PC Program Director designed the schedule with input from area medical facilities to best meet their staffing needs. The 10 total credits include two courses from the Health Care Core, as well as three Phlebotomy courses. If a student enrolled with the Health Care Core and the Phlebotomy courses already completed, they would only have to complete three 1-credit courses to receive the Patient Care Technician Certificate. For a student without prior education or experience, the program would include these courses:

- HCC 130 Fundamentals in Health Care Delivery 3 credits
- HCC 145AA Medical Terminology for Health Care Workers 1 credit
- HCE 109 Venipuncture: Basic Skills 1 credit
- HCE 111 Venipuncture: Advanced Skills 1 credit
- HCE 120 Clinical Practicum 1 credit
- HCE 261 Applied EKG 1 credit
- HCE 271 Patient Care Technician Skills 1 credit
- HCR 272 Patient Care Technician Practicum 1 credit

The Medical Assisting Program was designed as a compressed, intensive program which students complete in 25 weeks, attending three full-days each week. Students without the Phlebotomy Certificate would complete 15 courses in 25 weeks, with an additional 11 weeks of practicum to receive a certificate. This is done with a schedule that staggers the start and end dates of each class, so that students are

enrolled in no more than four classes at any time. While designed as more of a stand-alone program than some of the other programs that have created pathways with short-term chunks, the MA program is significant in that it has redesigned the delivery of the curriculum allowing students to complete the program in a compressed schedule. According to the Program Director, this program has become an employment pathway for individuals who face significant barriers to educational and employment success such as poor work skills and basic skill deficiencies.

The final pathway program I examined at PC was the Laboratory Assisting/Histology Technician program. The program began in 2002 and was developed and implemented by a former laboratory administrator who had approached PC to encourage them to respond to the shortage of qualified lab assistants as identified by area medical organizations. The Lab Assisting certificate provides education and training leading to employment in a medical laboratory, and has several options that provide different pathways, depending on the experience and education a student brings. If the student has experience as a phlebotomist, several courses can be waived, at the program director's prerogative. In this case, the student would need to complete five credits of required courses to earn a Certificate of Completion in Laboratory Assisting. These are:

- HCE Overview of Laboratory Assisting – 1 credit
- HCE 152 Laboratory Assisting: Principles and Procedures – 2 credits
- HCE 158 Laboratory Assisting Practicum – 2 credits

Students enrolling with no laboratory experience would complete 6.5 credits of required prerequisite courses. These are:

- HCC 130 Health Care Today – 3 credits
- HCC 145AA Medical Terminology – 1 credit
- HCE 109 Basic Phlebotomy Skills – 1 credit
- HCE 110 Phlebotomy Practicum - .5 credit
- HCE 111 Phlebotomy and Specimen Processing – 1 credit

Finally, if the student has completed an Associate degree in a health science discipline, the first two required prerequisite courses are waived and only the three phlebotomy courses, totaling 2.5 credits, would be required prior to beginning the five credits of required courses.

The next step on the pathway is the Histology Technician Certificate which provides education and training that leads to employment providing clinical support to pathologists and researchers in processing body tissues. Some of the prerequisite courses can be waived by the Program Director for students who have completed the Lab Assisting Certificate and worked for two or more years. The required courses for the Certificate of Completion total 24 credits:

- HCE 170 Overview of Histology Lab – 1 credit
- HCE 171 Histology Techniques Level 1 – 2 credits
- HCE 172 Histology Techniques Level 1 Practicum – 3 credits
- HCE 173 Histology Techniques Level 2 – 3 credits
- HCE 174 Histology Techniques Level 2 Practicum – 3 credits
- HCE 175 Histology Techniques Level 3 – 3 credits
- HCE 176 Histology Techniques Level 3 Practicum – 3 credits
- HCE 177 Histology Techniques Level 4 – 3 credits

- HCE 178 Histology Techniques Level 4 Practicum – 3 credits

In order to complete the Associate in Applied Science - Histology Technician, students take a range of required general education, and other elective courses to total 61 credits. Once the Associate degree is completed, a student can transfer to Arizona State University and take an additional 59 credits to complete a Bachelors of Applied Science degree. At present, PC is working on the development of an additional degree as a Medical Lab Technician which will allow students to apply for national certification.

The data I gathered and analyzed at Maricopa and PC included taped interviews with faculty, administrators, and staff, as well as written and electronic materials. I also photographed the campus and the building housing the Allied Health programs at PC to fully visualize the setting as I reviewed and analyzed the data.

#### *Summary of College Site Profiles*

Table 1, below, includes a summary of the data presented in this profile of the community college sites. The reasons articulated by these three community colleges for the initial development of chunked curriculum included declining enrollment and fear of program closure, along with a desire to increase student access, retention, and completion. For those programs included in my study, the interview participants continue to support chunking for following reasons:

- More effective communication and marketing tool for students, employers, and the community;
- Increased number of students who complete credentials;
- Motivator for students receiving completion certificates in chunked programs;

- Tangible demonstration to employers of skills learned by student;
- Enthusiasm among faculty based on perception of better connection to students and employers, and satisfaction of making needed changes to curriculum.

### Findings in Response to Research Questions

This section describes the perceptions of participants in this study organized in response to the three research questions:

1. What issues need to be anticipated when chunking professional-technical programs or degrees?
2. How can those issues be resolved?
3. What guidelines should be used when implementing chunking?

#### *Research Question #1: What Issues Need To Be Anticipated When Chunking Professional-Technical Programs or Degrees?*

The analysis of participant interviews, college catalogs, program brochures, college web sites, curricular materials, and reports provided by study participants was used to develop a list of the issues that arose when the colleges in my study used chunking of curriculum to create pathways. In reviewing the list of issues, three main categories encompassed the issues that emerged during data collection: (1) student issues, (2) institutional issues, and (3) external issues. Other researchers have identified many of these issues as well. For example, Summers (2003) found that a combination of student characteristics, external factors, and academic variables influences whether a community college student remains enrolled from term-to-term. On one hand, the nature of chunked programs – shorter, more intensive, and often operating on a compressed schedule – may increase the stresses a student experiences



Table 1

*Summary of Features of Case Study Sites*

Feature	Maricopa Community College System, Phoenix College (PC-MCC)	Portland (Oregon) Community College System, Sylvania Campus (PCC)	Shoreline Community College Shoreline, Washington (SCC)
Unduplicated	25,000 (2003-04) at Phoenix College	25,047 (2003-04) at Sylvania Campus	15,000+ (2002-03)
Headcount	alone	alone; 101,896 (2002-03) in PCC as a whole	
FTE	7,000 (2005) at Phoenix College	9,182 (2003-04) at Sylvania Campus alone 26,061 (2002-03) in PCC as a whole	5,600
Number of	3,000 credentials awarded, per year, at	413 certificate completers system-wide and	2,600 certificate completers
Credentials	Maricopa Colleges in the health care	1447 Associate degrees (figures from	since 1999 inception
Awarded	programs	2002-03)	
Started	Start date varied among programs,	1996	1999
Program	although initial implementation at MCC		
Chunking	for health care programs was 1998		

Table 1 (Continued)

Feature	Maricopa Community College System, Phoenix College (PC-MCC)	Portland (Oregon) Community College System, Sylvania Campus (PCC)	Shoreline Community College Shoreline, Washington (SCC)
Chunked	Allied Health Care which includes	Machine Manufacturing Technology	Manufacturing Technology (MT)
Programs	certificates in the following programs:	(MMT) offers certificates in Machine	which includes certificates in the
Studied	1. Health Information Technology	Manufacturing Technology.	following programs:
	2. Health Enhancement	As part of PCC's career pathways, several	1. Basic Manufacturing
	3. Phlebotomy	professional-technical programs are offered	2. Computer-Numerical Control
	4. Laboratory Assisting	in a chunked format. They include:	3. Quality Technology
	5. Medical Assisting	1. Accounting/Bookkeeping	4. Manufacturing Processes
	6. Histology	2. Criminal Justice and Corrections	Visual Communication Technology
	7. Patient Care Technician (for students	3. Emergency Telecommunicator	(VCT) which includes AAAS
	who are already working as Certified	4. Medical Lab Assistant	degrees in the following programs:
	Nurse Assistant, CNA)	Plus continuing education and non-credit	1. Graphic Design
		ESL programs	2. Offset Printing
			3. Digital Photography/Video
			4. Interactive Media
			5. Marketing

Table 1 (Continued)

Feature	Maricopa Community College System, Phoenix College (PC-MCC)	Portland (Oregon) Community College System, Sylvania Campus (PCC)	Shoreline Community College Shoreline, Washington (SCC)
Parent Division	Health Care Integrated Educational System	Math and Industrial Technology Division	1. Center for Manufacturing Excellence (MT)  2. Humanities Division (VCT)
Model	Integrated, collaborative model based on common competencies identified in cooperation with health care industry representatives, and includes: 1. Compressed, condensed class schedules 2. Single classes split into multiple, shorter courses 3. Packaging sets of courses as chunks, with credentials at completion	Model adapted from a Michigan community college, with input from local industry, and includes: 1. Open entry, open-exit, and self-paced, with each course modularized 2. Compressed, condensed class schedules 3. Packaging sets of courses as chunks, with credentials at completion	Collaborative model using an advisory panel with representatives from educational institutions, industry, and their associations, and includes: 1. Open entry, self-paced 2. Packaging sets of courses as chunks, with credentials at completion

Table 1 (Continued)

Feature	Maricopa Community College System, Phoenix College (PC-MCC)	Portland (Oregon) Community College System, Sylvania Campus (PCC)	Shoreline Community College Shoreline, Washington (SCC)
Outcomes (actual, as opposed to planned)	<ol style="list-style-type: none"> <li>1. More effective communication and marketing to students</li> <li>2. Students can explore more careers by gaining work experience after a shorter period of time</li> <li>3. Increased portability of coursework, such as taking a chunk to the local hospital and providing on-site coursework for employees to improve skills and move up the career ladder</li> <li>4. Shortages of skilled workers, as identified by area employers, can be addressed more quickly using, for example, compressed schedules or the student's own experience to shorten the time it takes to earn a required certificate</li> </ol>	<ol style="list-style-type: none"> <li>1. Format works well for students balancing work, family and school</li> <li>2. The awarding of certificates for smaller chunks was a motivator for students</li> <li>3. Certificates are a concrete symbol to employers of skills learned</li> <li>4. More one-to-one interaction with students resulted in Faculty satisfaction as they got to know students better</li> </ol>	<ol style="list-style-type: none"> <li>1. Increased enrollment in the programs studied (the MT program closed down for two years, prior to chunking, due to low enrollment)</li> <li>2. The number of program completers increased yearly</li> <li>3. Increased Perkins funding resulted from the larger number of programs completed</li> <li>4. Convinced employers of education's commitment to the manufacturing industry</li> <li>5. Improved student retention</li> </ol>

Table 1 (Continued)

Feature	Maricopa Community College System, Phoenix College (PC-MCC)	Portland (Oregon) Community College System, Sylvania Campus (PCC)	Shoreline Community College Shoreline, Washington (SCC)
Credentials	Certificates of Completion and Associate	State-recognized Employment Skills	Short-term Certificates, Certificates
Earned	of Applied Science degrees in the Program areas above	Training (EST) certificates (12-44 credits), one-year certificates (45 credits), two-year certificates (90 credits), and an Associate of Applied Science degree (108 credits), and continuing education units (CEU)	of Completion, Certificates of Proficiency and five AAAS degrees in the Program areas above

in balancing multiple life demands. On the other hand, since chunked programs offer the opportunity to complete a credential in a shortened time frame, they may be more attractive to the same student versus a traditional degree program that requires at least two years to complete.

### *Student Issues*

Student issues referred to problems which arose from an individual's personal situation, and which in turn prevented successful completion of the chunk being pursued.

*Appearance of life crises.* Study participants recognized that many of the students in chunked programs faced serious life crises that interfered with the ability to successfully complete a credential. Such crises arose unexpectedly, catching both the student and the program faculty off-guard, putting the student's enrollment or program completion in jeopardy. Participants expressed a combination of resignation and frustration in describing their certainty that students will experience major problems during program participation. As one faculty member told me in describing the students in her program, "*this student population is always in crisis.*" Another staff member described it this way:

*It's hard to keep students in school – broken legs, housing problems – it all happens. The best support is if students know each other – they'll support each other to stay in school - whether it's homework or rides. If they don't know anyone in the classroom – they are not vested – and they won't come back. (Staff)*

*Balancing multiple life roles.* One issue which came up often was the challenge of balancing the multiple roles of student, worker, parent, and partner, and the effect this can have on success in school. "*We know that, for many of our students, the*

*family needs that they have – we know that those sorts of demands – can be a barrier to their education” (Administrator).* Students found it difficult to secure support from family members for attending school, given the intensive and demanding schedule of chunked programs. *“We tell them up front it’s an intense program – we try to tell them that you won’t have a life during this program” (Faculty).*

A staff member interviewed told me that *“One of the biggest issues for continuing education is release from work to attend classes. You can know what you need to do next, but you can’t get to class if your boss needs you on the job.”* If an individual feels they cannot easily fit school into their work schedule, it may hinder initial enrollment in a chunked program, continuing enrollment, or returning to complete another chunk after a stop-out.

*Lack of basic reading, writing, mathematics, and self-management skills.*

Other issues raised by study participants included the lack of basic skills in reading, writing, and mathematics. *“A lot of our students have to go through the remedial classes, based on their Asset/Compass test. We sometimes see students with High School diplomas who can’t do basic math” (Faculty).* As described below, students became frustrated if lack of college-level skills necessitated remedial classes, and prevented them from enrolling in professional-technical programs.

*A huge issue for colleges is the under-preparedness of students – bringing them into a college environment and dealing with developmental needs and yet getting them the workforce training they need to get a job with good wages to support their family . . . we’ve looked at learning communities and/or other models that would simultaneously address developmental and workforce needs – so that they don’t get discouraged. I think of myself and wonder how I would feel if I had to take a year or two of developmental coursework before I could get into workforce training. (Administrator)*

Some study participants recognized that a lack of basic self-management skills prevented students from using effective decision-making and time management skills in pursuit of their goals. *“If the student isn’t particularly intrinsically self-motivated or doesn’t have good time management, they can get to that point of no return, where they are too far behind to catch up” (Administrator).*

*Fear when beginning postsecondary education.* Study participants pointed to the fear that students felt when embarking on an educational pathway, and recognized that fear is not a good foundation for learning. *“We forget how scary this place is. If you’re older, you think everyone is 18. If you speak a language other than English, you think no one will understand you” (Staff).* An instructor said that *“they (students) all go in scared to death and they come out feeling really good about themselves and what they can do. We will help them to the ‘nth’ degree as long as they are helping themselves.”* This instructor explained that many students in her program have not been successful in school previously, and they feared they would again fail academically.

*Mismatch between student’s goal of employment and college’s goal of degree completion.* Many of those interviewed stressed a mismatch between the student’s goal of quick training and immediate employment, and the college’s goal of degree completion. An administrator, who confessed that she wished all students would pursue a degree, told me that *“students come here to get skills and get a job. I wish everyone would get a degree, but most students, it’s not in their reality.”* A faculty member estimated that 80% of students in his program were not seeking a degree or



certificate, but attended part-time to develop specific skills and competencies. Another faculty member who provided the majority of the advising to program students said,

*We had to face the fact that people are interested in this profession, but many aren't interested in a degree. So, we had to look at what courses we could pull together into a certificate that would give them the relevant skill set.*

*Misperceptions or lack of knowledge about certain occupations.* Study participants found that student perceptions of specific occupations could also be an issue in chunked programs. Students sometimes had a stereotype of a particular occupation that did not match the actual job duties, and this prevented consideration of a particular educational program that may have been a good match for their interests and goals. In referring to manufacturing occupations, one participant told me, *"We have to get students away from the idea that this is a dead-end or dirty job."* Another participant at the same college told me, *"Manufacturing careers are not well understood – there is an education component for students to understand the variety of choices that are open to them."* Students may also not consider an occupational area simply because they are unfamiliar with it. A faculty member told me, *"People don't know about health information management or many of these health-related professions. They have to really dig to find us."*

*Length of stop-out can affect student's educational and occupational currency.*

One administrator believed that a future problem for colleges which implement chunking is that students may stop-out for too long after completing a chunk. If students do not continue their education, or do not come back within a defined period of time, they risk losing the currency of their education, and may have to re-take courses in order to progress in the pursuit of a degree.

*Stopping in and stopping out impacts the ability to remain current – if they (the students) don't stay in the field and/or continue their education. Then, you may have to recommend that the student retake courses. So, the pathway needs to be adjustable – based on changing circumstances, changing interests of the students. (Administrator)*

*Underutilization of college advising and other services.* Additionally, college services for advising were identified as resources underutilized by students. “*My guess is that the students who would most benefit from advising, don't take advantage of it*” (Administrator). Lack of advising resulted in missing required classes not offered every term, or not taking the right sequence of classes to complete a credential. Particularly troubling for some of the programs studied, was the conundrum that services offered outside of actual instructional time such as advising and tutoring were not utilized because students felt overwhelmed by balancing multiple roles, struggling with basic skill deficiencies, and the fear of academic failure. One faculty member told me that she found it hard to schedule anything outside of class time because of all the “*life-demands*” of her students.

#### *Summary of Student Issues*

Student issues were those which arose from individual students' unique personal situations, and which prevented enrollment in or completion of the chunk being pursued. The issues identified included:

- Personal life crises such as loss of housing or medical emergencies both of which hindered or halted students' studies.
- Similarly, the multiple roles required of some students became an issue when numerous demands slowed or stopped their progress. For instance, it was

expected that students with children would be called away by events such as day care closures or the illness of a child.

- Simply being a student with a job became an issue when it required such things as negotiating time off for school, or missing school because of employer deadlines or last-minute tasks.
- For many new students a major issue was the lack of basic skills such as reading, writing, mathematics and self-management, a shortfall in any of which necessitated remedial classes before the student could be accepted into a professional-technical program.
- Another student issue was simply the fear of beginning postsecondary education. More specifically, students feared academic failure, especially when the student was not previously academically successful. Students also feared social failure, especially when a student feels younger or older than other students, or if the student had been raised speaking a language other than English.
- Mismatched expectations emerged as another student issue, such as when the student expected quick training and immediate employment, whereas the college's expectation was one of continued enrollment and degree completion.
- Misperception and lack of knowledge about certain occupations were also issues for some students, such as being unaware of the range of options within a desired occupation, or incorrectly stereotyping certain occupations as dead ends.

- The duration of stop-outs became an issue for students when it became long enough to impact educational and occupational currency, requiring a repeat of a course or courses.
- And finally, the underutilization of important college resources, such as tutoring and academic advising, became student issues when appointments for them had to be scheduled too far outside of class time, requiring a separate trip to campus or a missed work day. However, despite these issues and potential barriers, the students continued to enroll and the colleges continued to offer and refine chunked pathways toward degree completion.

### *Institutional Issues*

Institutional issues were those which resided primarily within the individual community college's locus of control and included such things as staffing and workload concerns, financial considerations, organizational structure and college systems (i.e., advising, admissions, registration, scheduling), assessment and evaluation, communication and marketing, curricular processes, and assumptions made about chunking and pathways by college personnel.

*Staffing shortages and workload concerns.* Staffing shortages and workload concerns referred to personnel issues related to the resources needed to perform the teaching and other duties associated with chunked programs. They included issues related to shortages in staffing needed to implement and maintain chunked programs. Interview participants recognized that students have many needs, but usually programs did not have additional staff to assist students with advising or dealing with personal crises. Many faculty ended up adding the responsibility for dealing with student crises

to their teaching loads. *“The faculty are doing social services. They want to teach, but they care about the students, so they do more” (Staff)*. A staff member told me that *“regular advisors – don’t necessarily understand the program”* which meant that the faculty and other program-specific staff felt they must make time for advising, even for students who are not yet formally admitted to the college or the program.

Concerns regarding faculty workload and the time needed to develop and maintain programs that include chunked curriculum were often mentioned by participants. *“The upfront development work is very intensive, time consuming,”* said one instructor. Since so many community college instructors were part-time, it was difficult finding the resources to make needed curricular change. *“We do contracts with some of our part-time faculty to develop the classes, if we have budget money for that. Some are willing to do it on a volunteer basis” (Faculty)*. A former faculty member who now works as a liaison to business told me, *“There’s this expectation that teachers will develop curriculum, but I don’t know if there’s time, frankly.”* Faculty contract issues also complicated the workload issues involved in chunking. *“We’re tied to that faculty union contract that dictates a traditional schedule and limits how and when we can offer classes” (Faculty)*.

Heavy workload and inadequate staffing may lead to a perception that chunked programs are too much work for too little payoff. As one staff member who coordinates pathways told me, *“The hardest thing is scheduling – convincing faculty and decision-makers that it’s worth it to do the extra work so the classes are sequential and organized in a fashion that makes sense for students.”* Some felt the time involved in building community partnerships, student advising, curriculum

redesign, developing effective industry networks, and especially negotiating the complexity of college administrative processes could limit the ability to remain innovative and maintain currency in their profession. *“I’m very ashamed that I’m so far behind in getting the next program started, but something has to give” (Faculty).*

This same faculty member also told me that one of her major concerns was *“currency working in my field – how do I keep current when I haven’t worked in my profession for the last three years?”*

Concerns were also expressed about the difficulty in finding instructors interested in teaching in chunked programs at the community colleges studied. An administrator, referring to the dilemma of attracting instructors to a compressed schedule that includes teaching six to eight hours a day for several contiguous days said: *“Faculty shortages are huge. We can’t compete with the private sector. We can no longer offer the same ‘hooks’ – like summers off. Schedules now need to be more flexible – nights, evenings, weekends – are part of the deal for all faculty” (Administrator).*

*Concerns about increasing costs.* Increasing costs were a problem for most community colleges, but those involved in chunking felt a particular conflict in trying to lower the cost of instruction by maintaining larger class sizes, while trying to give students and employers the guarantee of knowing a published class would be offered. An administrator told me that he struggled with showing that chunked programs made financial sense for the college, *“if all the school cares about are completion rates in the short-term, this (chunking) doesn’t necessarily meet that need.”* As the goal of increased enrollment is achieved through chunked programs, colleges face the

dilemma of increasing costs for equipment and supplies to support the increased enrollment. One instructor expressed his concern that increasing costs impacted professional-technical programs by limiting current flexibility to design innovative curriculum structures like chunking, *“there are logistic issues, funding issues – this is an extremely high-cost program.”*

*Lengthy and complex curriculum design and approval process.* Concerns regarding the curriculum process came up frequently during interviews. One administrator jokingly referred to the committee that oversees the curriculum approval process as the *“Curriculum Prevention Committee.”* Many of the issues raised involved the time and complexity of modifying curriculum and scheduling formats for chunked programs. One faculty member who had been department chair during the change to an open-entry, open-exit, chunked curriculum told me that there were *“lots of questions from the Curriculum Committee and lots of time involved. It took almost a year to make it through with all the courses.”* Another instructor from a different college reported, *“In terms of the downside, one of the things we’ve found is that the curriculum development process is lengthy. So, it may take over a year before a change in curriculum can get through the process.”* One participant reminded me that this slowness in adapting curriculum and scheduling formats has a direct impact on student enrollment:

*I’ve talked with two people recently who transferred to Apollo – one said it was a childcare issue – she needed to be home at a certain time, and she couldn’t be and take the classes she needed. The other just said that ‘it took too long.’*

Several participants inferred that students had problems accessing the required general education courses because they were not usually offered in flexible scheduling

formats like the chunked programs. An administrator told me that *“General Education course scheduling is very difficult to fit in with chunks and doesn’t work for technical students – and it’s a lot of the reason why these students don’t finish degrees.”*

Other participants reported that it was challenging to decide which courses belonged with which chunk, as well as what portion of a course could be eliminated without impacting student outcomes. *“If you design a program without thinking how the pieces fit together, you’ll never get pathways done; you’ll never get that progression” (Faculty)*. It was difficult fitting pre-requisites into the chunked program, and maintaining the goal of a short, intensive program.

*One of the things that hurts us is the nature of the content; it could take a student three or four semesters to complete the certificate. We struggle with that all the time – there’s so many prerequisites – it’s not something you can take in all at once. (Faculty Advisor)*

The interrelationship between pre-requisite courses and program courses can be complex and can affect the transition of students from one chunk to the next. One Faculty member illustrated the complexity this way:

*Our district was going through programmatic changes and a standard core curriculum was a requirement for new programs. We knew we’d have to include the core, and we wanted to build on existing classes, but there were sometimes pieces of classes we wanted to include – not the whole class. How do we accommodate this? One big challenge was in biology – in the degree program, students have to take two required classes, but there is also a prerequisite class to begin the sequence, and all are four-credit classes. For the certificate – we didn’t think they needed that all. So, we thought they could take the overview class and that would be enough. But, if we wanted to have a ladder between the certificate and the degree, we’d have a problem because they’d need to come back and take three four-credit classes in addition to the overview class they took for the certificate. The hurdle still exists in our program – the other department has refused to budge on this. When we started moving into the other certificates, we realized it didn’t make sense to tell them they’d have to take a certain class for one certificate, and that that class didn’t transfer to another certificate within the same*



*program. During this time, our student population changed – more part-time students and they needed to take the program in pieces. What can we do to give them pieces at a time that will help them as they access their career and that lead into our degree program? We’ve worked very hard . . . there are still a few glitches, but we continue to work on this.*

Student recruitment to chunked programs was hindered by multiple institutional factors such as advisors unfamiliar with the chunked programs, marketing materials and class schedules that did not adequately explain chunking and pathways, and institutional structures like admissions and registration processes that did not take into account that chunked programs may operate on an alternative schedule.

*Advisors unfamiliar with chunked programs.* A staff member told me that “*Advising is so difficult because there is so much the advisor has to know. Technical change happens so fast – it’s difficult to advise about employment and plan an educational pathway.*” Some faculty members expressed concerns that general advisors did not have adequate knowledge about the technical programs or the industry the students are preparing to enter. “*Regular advisors don’t necessarily understand the program*” (Faculty).

*Lack of materials which describe the chunks and the pathway.* Marketing of chunked programs and pathways was particularly difficult because of the lack of clear and concise information describing the chunks that made up the pathways. “*Marketing and recruitment is something we’re looking at. That’s one of our biggest problems is getting the word out that we’re here – people aren’t that familiar with this*” (Faculty).

A staff member believed that the current way the college depicted pathways was inadequate and likened it to a roadmap without any details:

*Your vacation starts here, and it ends here, three states away, but we haven't mapped out the rest areas along the way. We have the beginning and the end – but we don't show how they can stop-out. Students really want to be in a program – they want to get started – they want to know how to get in.*

*Academic systems not supporting chunked programs.* Chunked programs present challenges to departments responsible for functions such as admissions, registration, and data reporting. Interview participants reported that, in some cases, students were subject to late fees because the class did not begin at the traditional start of the term, or financial aid awards were withheld.

*The biggest challenges are the academic systems. We don't follow the traditional semester program, so students register at different times. We have late starting classes. We have to work out registration fees, financial aid, and even the awarding of certificates. The college normally only awards certificates at the end of each semester, but students can't take their national boards until they have their certificate. (Faculty)*

*Lack of systems to connect with students after the first chunk.* Most interview participants admitted that outreach to students who completed the first chunk was not routinely done because of a lack of staff resources, and a system to locate students who were no longer enrolled. “*We can't find people or their phone numbers - people relocate so quickly. I've tried a couple of times and I just can't find people*” (Staff). A staff member who works in a college program funded through the Workforce Investment Act told me: “*We do some calls to make sure if they are still working, but frankly, there's nothing in it for me, and we just don't have the resources – I have so much work to do now.*”

*Not securing or utilizing feedback from employers and students.* There were also concerns raised about the community college's ability to make connections to

students and employers, and to effectively utilize feedback from both students and employers to assess and modify chunked programs. *“The toughest part is the connection to employers and the labor market . . . relationships are the key because we’re looking at long-term employment for these folks” (Staff)*. An administrator was concerned that community colleges *“get so focused on the occupation itself that we forget to look at the bigger picture”* that would allow them to understand the changes in industry and how those changes impact educational delivery. One interview participant expressed a concern that colleges continued to survey employers, but they have yet to successfully act on feedback from employers that basic reading, writing, and mathematics skills are essential in the workplace.

*Negative assumptions about pathways and chunking.* Finally, negative assumptions about chunking and pathways can impede its initial adoption, as well as its recognition and acceptance by others in the college. Some of these negative assumptions were simply resistance to change: *“In the culture of our institution, we have people who believe that we did it this way 20 years ago, and by God, we’re going to do it this way now” (Administrator)*.

Faculty were concerned that the number of students staying in college to complete a degree would decrease – if students completed a chunk and left to find employment. An administrator reported that there was *“concern”* among faculty when she first proposed chunking degrees because *“faculty worried that they would lose students from their longer courses.”* A faculty member at another college told me: *“We (the faculty) were very concerned about diluting the two-year degree, and that this would pull from our two-year program” (Faculty)*. Another participant expressed

some frustration about the lack of acceptance for chunking: *“People don’t go from high school to college to work. They weave all of that - they go to college, they work for a while. I think a lot of people still don’t get it” (Faculty).*

An administrator believed that part of the resistance to chunking lay in the belief by some faculty that the push to develop chunked programs was coming from administration. *“Issues arise when the push for chunking is seen as coming from central administration – you’re viewed with suspicion when you come from the district” (Administrator).* Some faculty even felt that they angered other faculty because of the flexibility they demonstrated in chunking curriculum:

*There are people who are very upset that I’ve taken these courses and reduced them down to a week-long course. They think they’re preserving the profession by not chunking. I hear that all the time. If you want to stay behind, you’ll be a dinosaur. We’ve shot ourselves in the foot, if we can’t look at the future. (Faculty)*

Some participants believed that chunking and pathways were sometimes dismissed as “only” a workforce development initiative. One administrator, who directed the implementation of pathways at her college, told me of a discussion regarding whether her new department should be placed under the workforce development department of the college, but administration felt she would not have sufficient clout, unless it was located in academic services. A staff member at a different college described the disadvantage of pathways being situated in the workforce development branch of that college:

*The cost is that there is no real power to make and sustain change. My big fear is that this work will go away because there is no endemic change that is sustainable over time. The colleges where this is more systemic probably have more success because it is part of the academic system.*

*Summary of Institutional Issues*

Institutional issues were those for which locus of control resided with the community colleges. The issues identified included:

- Staffing and workload issues were identified by many participants, a shortage of the former leading to an excess of the latter, which was then exacerbated by faculty contract issues and the initially time consuming nature of designing and delivering chunked pathways, all of which made staff and faculty buy-in imperative.
- Staffing and workload issues led directly to the next issue, the challenge of debunking negative assumptions about pathways and chunking in general, including faculty concerns about diluting the two year degrees, losing their students to other programs such as workforce development, and concerns that stop-out students would not return for the next chunk or at all.
- An equally significant issue was money. Increasing costs in general limit a college's flexibility to adopt innovative programs, specifically in professional-technical programs which have a reputation for being "extremely high-cost" programs.
- Once a college decided it could afford the program, it then faced the next issue, the lengthy and complex curriculum design and approval process. This process encompassed identification of pre-requisites, scheduling chunked classes around inflexible general education courses, modifying an existing curriculum, and identifying which courses belonged to which chunk. The crux of this issue was time: once a program was completed and approved, was the material still

applicable, or had the target industry already moved on? Connected to the curriculum process was the issue of collaboration which, like faculty and staff buy-in, was imperative.

- Securing and utilizing feedback from industry was critical to keep coursework current and relevant. Feedback was obtained from target employers, in order to assess and modify chunked programs as labor market and industry needs changed.
- In terms of the students, scholastic advising was an issue. There was a consensus that advisors were already challenged, in staying current with existing curricula, without having to advise students about chunked pathways, professional-technical programs, certificates, stop-outs, and target industries.
- In a related issue, inadequate marketing and recruitment materials which described chunked pathways hindered the ability of advisors to explain the programs to current and prospective students.
- Finally, academic systems were identified as insufficiently flexible to support chunked programs. For instance, data systems for admissions and registration were not or could not be programmed to recognize chunks and pathways to degree completion. This resulted in erroneous late fees and financial aid ineligibility. Similarly, a lack of systems for identifying and contacting students who completed their first chunk resulted in students registering for the wrong follow-up class or not registering at all. However, again, despite all the issues and potential barriers identified above, the colleges not only adopted

chunking and pathways, they also reported high levels of enthusiasm among the stakeholders -- and enthusiasm makes almost anything possible.

### *External Issues*

External issues were those which existed outside the college structure, yet influenced the institution's ability to develop, implement, and maintain the chunked curriculum that creates pathways to degree completion. These barriers included state and federal regulations or policies, economic considerations, employer concerns, and conflicts that arose from working with partners.

*Financial aid regulations that prevent students in chunked programs from receiving aid.* Financial aid regulations were an area of particular concern, since so many community college students did not have the financial resources to cover the costs of school, and current interpretation of financial aid regulations made it difficult for students in chunked programs to receive financial aid. Many students enrolling in chunked programs did not initially intend to complete a traditional certificate or degree, and were denied financial aid because of this. Other difficulties with financial aid regulations occurred for students attending part-time, and for those enrolled in programs with alternative scheduling, since grading and enrollment periods did not fit with financial aid policies. *“Financial aid needs to be more open, and we need to change the federal law to make it possible for students taking these short-term certificates to receive financial aid – even a loan. This is a huge issue for underserved populations” (Administrator).*

*State funding policies based on hours of instruction alone.* Participants felt that regulations which required a certain amount of “seat time” or clock hours for each

credit hindered adoption of the flexible scheduling needed to make chunking successful.

*I think one of the other challenges that we are facing in education is the way we deliver education. I think over time, and not much time, we are going to have to move away from thinking of the traditional Carnegie unit into something much more flexible –perhaps very competency-driven. Is it necessary for students to be in a classroom for 3 hours a week for 15 or 16 weeks? Probably not. Can they learn in different ways? You bet! What mix and match works best for students?*  
(Administrator)

*Labor market and economic factors dictated changes in how colleges prepare students for employment.* Obviously, the actual labor market demand for a particular occupation impacts the number of students who can find employment following completion of a chunked program; but interestingly, the perception of the potential student population about the occupational area was also important, according to interview participants. If an occupation is not well-understood or is thought to be of low-status, students may not even consider enrolling in the program and marketing efforts may be ineffective.

*We really have had to market the program – with the downturn in the economy; the general public doesn't think it's a viable field. We need to educate potential students about how broad manufacturing is and that the jobs are highly skilled and highly technical - and available.*  
(Faculty)

Participants also reported that students and community colleges needed to recognize and adapt to changes in a specific industry or in the overall labor market.

*We were educating students for a (industry) system that no longer existed. The community reported that our grads didn't have a good idea of what other people on the team (in the workplace) did. They didn't understand their scope of work. They also didn't know how to work in a team very well.* (Administrator)



Another study participant told me, in describing what he termed the “*mistake*” community colleges had made in defining manufacturing programs too narrowly:

*Industry needs people that are flexible, that can do R&D (Research and Development), that see the big picture. They need people that can do more than just run that machine. They can learn a new machine – or a new process. The technology has changed a lot – the economic conditions and the globalization of the economy has changed the definition of what it means to be a manufacturing professional now.*

The ability of the faculty to weather economic downturns in the occupational area was also important. If the faculty does not have the breadth in the occupational area to adapt, as one section of the industry declines and another expands, it will be difficult for the program, as well as the individual faculty member to weather the change. One participant told me that the occupational program at the community college was so tied to one employer that when large layoffs occurred with that employer, “*enrollment dropped so badly . . . that we closed the program*” (Faculty).

*Challenges in working with employers, professional associations, advisory committees, and partner organizations.* Several interview participants spoke of the challenge of working with employers and professional associations, and the need to improve the reputation of education in responding to the needs of business and industry. They believed wariness was evident on the part of employers in their interactions with educational institutions. One faculty member told a story of an interaction between an employer and another community college. The employer asked how long it would take to design and teach a course at the employer’s location. The employer was told it would take about two years before the course would be ready to teach. According to the faculty member who told me this story, “*they (the employer)*

*had kind of a tainted view of community college technical education from that one interaction.”*

The perception of the interview participants was that education has been slow to respond to the needs of business and when colleges did respond, it often took so long to develop a product or service that it was out of date when delivered. *“Academia has given industry a lot of lip service over the years, and when they’ve finally done something industry wants, it’s taken academia five years to do it, and by the time it’s developed, it’s five years behind the times” (Faculty)*. This was not to say that community colleges did meet the needs of business and industry, but most had to work to get business and industry beyond the perception, and perhaps the experience, that working with education would be frustrating and slow.

Professional associations were an important source of information, professional training, and credentialing for students and faculty alike, according to participants. However, associations may have concerns about the direction the college takes when it moves into areas such as chunking of curriculum and the offering of short credentials. *“We have some new standards for degree programs from our professional association, but they kind of move away from the pathway a bit. There’s not as clear a connection from the associate to the bachelor degree” (Faculty)*. A barrier can also be created for students who enroll with credits from another institution that is accredited by a different professional association. *“There are two national organizations who offer accreditation for programs like ours. We have students who come to us that may be credentialed by the other professional organization who say ‘do I have to take these beginning level classes?’” (Faculty)*

Participants also spoke of the role that Employer Advisory Committees played in curriculum chunking. The general function of most Advisory Committees is to provide guidance to professional-technical programs at the community college. Some states require that the Advisory Committee approve any changes in program curriculum. Faculty in my study had to educate and convince the Advisory Committees that offering students a chunked program would not lessen the quality of educational preparation of students in the profession.

*All our degree and certificate programs have to be approved by a professional advisory committee. Our advisory committee, for a long time, was not willing for us to do the (chunked) program because they felt that it might detract from our degree program. And they really wanted degreed students . . . change of mind came when there was a huge labor need. (Faculty)*

According to several interview participants, educational credentials were not valued by employers or students - skills and the jobs they lead to were more highly valued. Thus, there was little encouragement or incentive to return to complete a degree after securing employment. *“On the one hand, employers appreciate the degree because it shows a dedication to getting it done, but they’re more concerned about demonstrating the skills needed to do the job” (Faculty)*. Given the results of the literature review which indicated the benefit of degree completion in terms of wages and career advancement, this is a significant issue.

Finally, were issues that developed when working with partners on the development of chunked programs and pathways. Interview participants believed that students served in professional-technical programs should be able to seamlessly transfer to a four-year university to pursue a Bachelor degree without a significant loss of credit, even though professional-technical degrees are traditionally considered a

terminal degree. *“The university system many times doesn’t even take these credits as electives” (Faculty)*. However, most felt that there was little incentive, particularly for public universities, to participate in creating pathways that allowed students to move seamlessly from completion of a professional-technical degree to the university. *“The piece that’s missing is that we don’t have a Bachelor’s degree program - or Master’s - in our professional area” (Faculty)*. A number of participants reported that public universities were much more resistant than private universities to creating pathways from the community college to the university.

*They (public universities) are so entrenched in the traditional methods, they just don’t get it. You know who really gets what we’re doing? The four-year private colleges. They get it – University of Phoenix looks at it and this is what they’re doing with Bachelor’s degrees.*  
(Administrator)

One of the primary referral sources for many of the chunked programs was dislocated workers programs or One-Stop Career Centers. However, the perception of some interview participants, as indicated below, was that staff from these programs may not be current in terms of the real day-to-day activities a student will perform on the job, or in terms of the viability of the occupation.

*We don’t know what the programs are telling these students – do they make sure students know that they shouldn’t stop after they finish one chunk? I’ve had the funding be pulled out from under people by the worker retraining programs. It’s up to the individual staff person to OK the training, and it’s up to them to decide if this is a high demand occupation or not.* (Staff)

### *Summary of External Issues*

In summary, external issues were those which existed outside the community college structure, yet influenced the institutions’ ability to design, implement, and maintain the chunked curricula which made up the pathways to degree completion.

- The first issue was money. Federal and state funding both had requirements for minimum hours and, for this reason, neither was amenable to a chunked pathway structure. Federal and state financial aid to students required minimum credit hours, and state funding for the colleges required minimum clock hours, or “seat time.”
- Other external issues included labor market and economic factors, both of which informed the ways that colleges prepared their students for employment. Chunked pathways, by definition, needed to be based on the likelihood of available and desirable jobs at the time their students completed a particular chunk or program.
- The final external issues were identified as the challenges encountered in working with employers, professional associations, advisory committees, and partner organizations; primarily the perception, on the part of employers, that educational institutions were unable to respond to the needs of business and industry in a timely fashion; and the perception, on the part of the colleges, that the employers – and sometimes the students - did not value academic credentials, that once the student got a job the student was less likely to come back and finish the certificate or degree, which was the colleges’ goal.

*Summary of Research Question #1: What Issues Need To Be Anticipated When Chunking Professional-Technical Programs or Degrees?*

This section described participants’ perceptions through the framework of the first research question: What issues need to be anticipated when chunking professional-technical programs or degrees? In response to this question, three main

categories emerged during analysis of the data: student issues, institutional issues and external issues. The issues for each category are summarized below:

Student issues:

- Appearance of life crises, such as loss of housing or medical emergencies.
- Balancing multiple roles as student, worker, parent and partner required developing strategies such as negotiating for release time from work.
- Lack of basic reading, writing, mathematics, and self-management skills, any of which made remedial work necessary.
- Fear when beginning postsecondary education, which included fear of academic failure.
- Mismatch between students' employment goals and colleges' degree completion goal.
- Misperceptions or lack of knowledge about certain occupations, such as stereotyping certain jobs as dead end.
- Length of stop-out affecting students' educational and occupational currency, necessitating a retake of certain courses in order to further pursue a degree.
- Underutilization of college services such as advising, especially when they are provided outside scheduled class time.

Institutional issues:

- Staffing shortages and workload concerns made staff buy-in imperative.
- Concerns that increasing costs in general may limit a college's flexibility to design innovative programs like chunking pathways.

- Lengthy and complex curriculum design and approval process, exacerbated by the need to map the chunks and pathways so as to include general education requirements and prerequisites.
- Advisors unfamiliar with chunked programs, professional-technical programs or the industry being served, hindering both recruitment and advising.
- Lack of marketing materials which describe the chunks and pathways, again hindering both recruitment and advising.
- Academic systems that do not support chunked programs, such as data systems in Admission or Registration causing late fees or financial aid ineligibility.
- Lack of systems to connect with students after the first chunk due to lack of resources.
- Not securing or utilizing feedback from employers and students which was necessary to understand changes in the labor market and industry and how it may impact education delivery.
- Negative assumptions about pathways and chunking such as deterioration of the teaching profession, or dilution of the two-year degree.

External issues:

- Financial aid regulations that prevented students in chunked programs from receiving financial aid due to conflicting requirements for student hours and degree completion.
- State funding policies, based on hours of instruction alone, hindered flexible scheduling.

- Labor market and economic factors dictated changes in how the colleges prepared students for employment, such as labor demand and job desirability.
- Challenges in working with employers, professional associations, employer advisory committees, and partner organizations, such as their belief that working with educators would be slow and frustrating, or that chunking results in an inferior education.

To conclude this section on Research Question #1, a staff member summed up the importance of the issues presented here:

*So many students come here with a dream of getting something and too many leave without completing that dream – and we don't celebrate their success along the way – and then they leave and they see themselves as a drop-out – even though they didn't really drop out, they just stopped-out for a time – and they haven't seen a way to come back.*  
(Staff)

*Research Question #2: How Can The Issues That Arise When Chunking Be Resolved?*

Once the list of issues and barriers that develop when chunking curriculum was identified, the methods employed to resolve them were analyzed through participant interviews, college catalogs, program brochures, college web sites, curricular materials, and reports provided by study participants. This section details the methods used to resolve the issues and barriers encountered. It is organized into common practices employed by the three colleges studied to address those issues. Many of the strategies addressed several of the issues raised by study participants, and impacted all of the categories I employed to organize the issues (i.e., student, institutional, and external issues).

The first five strategies identified below primarily addressed issues directly related to recruitment and retention of students. The remaining eight strategies were



derived from responses by study participants, and addressed issues across the spectrum of student, institutional, and external barriers, and were identified by respondents as reasons why chunking had been successful.

Common strategies employed by colleges in my study to address the issues that arise in chunking included:

1. Program orientations for new students;
2. Use of cohort groups;
3. Program-specific advisors and mandatory advising of students;
4. Materials developed to provide details about the chunked program and pathways;
5. Financial aid designed for students in chunked programs;
6. Changes in how faculty workload was organized and calculated;
7. Faculty leadership in curriculum and program changes;
8. Strong involvement of employers and advisory committees;
9. Curriculum focused on skills and outcomes;
10. Curriculum and scheduling flexibility;
11. Securing external funding supporting development of chunks and pathways;
12. Tracking and evaluation providing feedback and program improvement;
13. Strong institutional leadership and administrative support.

### *Strategies to Resolve Student Issues*

This section describes strategies employed by the three community colleges studied which primarily addressed chunking issues that directly impacted student recruitment and retention. They included program orientations, use of cohort groups,

special advising, marketing materials designed for chunked programs, and financial aid for students in chunked programs.

*Program orientations for new students.* All of the colleges studied included some sort of orientation for students interested in enrolling in the program.

*We have to get them familiar with how the program works because it's outside the traditional model that people associate with the community college. We have to get them familiar with how our program works, and what the possibilities are. For many it's about managing their time and some embrace it and some can't handle it. (Faculty)*

Program orientations were seen by study participants as a way to address student issues by providing clear and consistent information, and were believed to improve retention. It was believed that the presentation of information about academic requirements, the occupational area, program expectations, and college resources alleviated some of the fear students felt when starting school, reduced misperceptions about the occupational area, and encouraged students to utilize college services. *“We have found orientations are very effective in helping students better understand what the program - and the jobs they are training for - are all about, and how we can help them be successful” (Faculty).* A Faculty Program Director explained the impact on students this way: *“We do an orientation – and you can just see the students relax a bit after we explain the program to them.”* An advisor believed that spelling out program expectations helped students improve their self-management skills, particularly in the area of time management. *“The orientation lays out everything from attendance to timelines for assignments, to expectations for behavior in class. It can really help students understand what we expect and the importance of managing their*

*time well.*” One administrator told me about a proposal to include family members in the program orientation for new students.

*We have a couple of proposals on the table to do a family night at the beginning of each semester. So that, at the beginning of the semester, we not only bring the student in for an orientation, but the family as well, and they hear about the program, and the expectations, and what its going to take, and what impact it might have on the family.*

To summarize, program orientation for new students interested in the chunked programs was a strategy used by all the colleges studied for the purpose of providing clear and consistent information to prospective students about the programs’ academic requirements, occupational areas, and program expectations. Program orientations also provided information about college resources - such as advising - which could, for instance, help students enhance their self-management or time-management skills. Orientation was also seen as a successful strategy for alleviating the fears of being a new student.

*Use of cohort groups.* The use of cohorts was also believed by study participants to address student issues, particularly those related to the stress of balancing multiple life roles, and the fear many students have when beginning postsecondary education. Cohorts were employed most frequently in programs having a compressed or alternative schedule or those that were targeting a particular population such as dislocated workers. The sense of support students experienced as part of a cohort also helped when a family or personal crisis may have caused a student to consider dropping out. Cohorts alleviated fear by helping students feel less isolated, and provided a supportive network which could assist cohort members with information and resources.

*The cohort's real benefit is to get them over that initial fear of how to navigate an educational system – especially those to whom college is brand-new and no one in their family ever went to college. It starts them on a pathway to building a community – it's less important after they have a support system established. Two or three terms after we did the cohort in the criminal justice program, the students were still meeting in the cafeteria at the same time. Students know the lifeline is there and they know they can draw on it when they need it. (Pathways Coordinator)*

This same Pathways Coordinator, who worked with students funded through the Workforce Investment Act, told me that he strove to create mini-cohorts, even among students who weren't in a program using a cohort model.

*I'd go out once every other week and buy them all coffee together. I'm here: what are your problems, who's doing what – now they see themselves as a group, and now I can start backing out. It's person-to-person, student-to-student – that's how we're able to build the group.*

As with new student orientations, cohort groups were used as a strategy for addressing student issues such as the fear of beginning postsecondary education, the stress of balancing multiple roles, providing a sense of support for students experiencing personal crises, and creating an atmosphere in which peer pressure could be exerted on would-be drop outs.

*Program-specific advisors and mandatory advising.* All the programs included in my study had program advisors – either faculty or student services staff or both – who provided in-depth advising to students on occupational and educational pathways and college resources. In one program, a designated program advisor, funded through the federal Carl Perkins program, provided support to students in several similar occupational programs. This support included working with each student to develop an educational plan and an academic schedule, as well as assistance with creating a resume and looking for a job. The advisor also provided information and referral on

both college and community programs to address educational, financial, or personal issues. In other programs, faculty were given either release time from teaching or extra compensation for the more involved advising that chunked programs require. Some programs, by design, have embedded advising into the classroom where it is accommodated as one-to-one or small group instruction. Advisors often used a worksheet to help students map out a long-term educational plan listing courses, resources, and contact information.

*Some programs have a decision-point after the first chunk: Do I want to do a second chunk? Do I want to do an internship? Do I want to take other classes? Is this enough for now? So, there needs to be a conversation in the first term about what their plan is. If it isn't school, it's how to come back to school: What's beyond the next job?*  
(Pathways Coordinator)

Mandatory advising was achieved in two different ways; by requiring instructor permission for all or some of the courses in the chunked program, or by requiring that students meet with an advisor prior to registering for classes. Either way, the intent was to make sure that students had an understanding of the program, prerequisites, course sequencing, college systems, and occupational outlook. The advisor also helped students assess whether their academic skills and career goals were a good match for the program. One program used a database of all students in the program, and a letter was sent out before each term reminding all students to schedule an advising appointment.

*We advise students in our program every semester and that's faculty advising – which is very rare. It can be a pain – but we've done this since the beginning. We schedule ten minute appointments for all students. We don't get 100% participation, but it is close. We want to make sure that students don't dig themselves into a hole – so many students are part-time, and most classes are offered every semester, but some are only once per year – we don't want them to miss that*

*opportunity – and we can talk about other programs and other classes. That has really helped our retention. (Faculty Program Chair)*

To summarize, program-specific advisors and mandatory advising helped students develop an educational plan, an academic schedule, a resume, and a job search strategy. Advisors also helped students assess whether their academic skills and goals were a good match for the program, and they provided information and referrals for addressing educational, financial, or personal issues. Advisors were faculty or student services staff, designated program advisors or imbedded advisors available in the classroom. Compensation for faculty advisors took the form of release time from teaching, or extra monetary compensation for more involved advising. The federal Carl Perkins program helped one college fund a designated program advisor to support students in several occupational programs. Mandatory advising was achieved by requiring that students meet with an advisor prior to registering for classes, or by requiring the instructors' permission to enroll in those instructors' classes.

*Materials developed to provide details about chunked programs and pathways.*

Program brochures, flyers, and handbooks were frequently used as marketing and information tools in the programs studied. Two of the programs developed handbooks which provided an extensive overview of the program, and the occupation to be studied. The recognition that students needed a visual depiction of the pathway and its chunks led programs to develop these types of tools.

Each PCC chunked program, working with PCC's WIA-funded Career Pathways team, developed a one-page flyer that provides detailed information about each chunk including a program overview, cost, prerequisites, courses, steps to

admission, and a contact person for more information. An example of the program flyer for the Machine Manufacturing Technology Program is included as Figure 9.

Shoreline developed a guide for students to the Certificate in Basic Manufacturing which included background on manufacturing employment and careers, information about the skills students can acquire in the certificate program, details of how the program works, and an inventory to help the prospective student assess their interest and current skills in manufacturing. Shoreline also created two visual depictions to assist students in understanding how the first chunk - the Certificate in Basic Manufacturing – is part of a pathway that includes high school, community college, and university educational experiences. *“It makes the students think about what they’re interested in and what kind of skills they have. I can use this in counseling students” (Faculty)*. One roadmap developed for SCC’s Manufacturing Technology program was included earlier as Figure 5.

In the Visual Communication Technology program, Shoreline produced a written flyer, with an online version, explaining each credential, including the Certificate of Completion. The flyer explained the program, and outlined the courses that make up the certificate. It also provided information about career opportunities including titles of positions in the industry and entry-level salary estimates.

The Maricopa system developed a map of the educational pathway from high school through the Bachelor of Applied Science degree for several of the healthcare programs. Maricopa Community Colleges also produced a glossy publication, titled “Focus on Healthcare Careers” that provided general occupational and program

# Machine Manufacturing

## PCC/MHCC Career Pathways Training

### Professional/Technical Training

This is a two-term course designed for students pursuing entry-level work in the machine manufacturing industry. The target wage for entry-level positions in Oregon is \$9-11/hour.

Skills gained in this course can lead to various jobs in the machine manufacturing industry and serve as solid preparation for the PCC Machine Manufacturing one or two year certificate and the Associate of Applied Science Degree.

### Cost

Estimated cost for this training:

Tuition and Fees .....	\$1,812.65
Books, Certifications and Tools .....	\$210.00
<b>Total .....</b>	<b>\$2,022.65</b>

### Curriculum

Students take the prescribed core courses in term 1, and then choose one of the three career specializations and an internship to complete their training.

### Features

- Students earn 26 or 26.5 college credits that may be applicable to other PCC degree programs while learning a new career.
- Students are work-ready upon completion of the training.
- Training is on the State of Oregon Eligible Training Providers list.
- Students will be prepared for a variety of entry-level occupations in manufacturing.
- Students participate in intensive job search training.
- A cohort learning community is developed and supports students as they pursue employment in the manufacturing field.
- This training is offered in partnership with the PCC Machine Manufacturing Technology Department.

Portland Community College is an Affirmative Action, Equal Employment Opportunity Institution. If you have a disability that requires any special materials, services or assistance, please contact the Office for Students with Disabilities, 503-977-4341, TTY 503-977-4877, at least 72 hours prior to the first class so we may arrange appropriate accommodations. For general information via TTY, call 503-977-4877.



**Portland  
Community  
College**



**MT. HOOD  
COMMUNITY COLLEGE**

### Prerequisites

- Students must possess a High School Diploma or GED.
- Complete a COMPASS placement exam (results of the exam should place students into Writing 90, Reading 90, and Math 20) at a PCC Testing Center.
- For information on free workshop to prepare to take the COMPASS test please call 503-788-6218.
- If test scores are below those listed above, please call the training contact to discuss enrollment options.

### Courses

#### Term 1

Monday–Friday at PCC Sylvania.

MCH 100	Machine Tool Basics	(1 credit)
MCH 105	Blueprint Reading I	(1.5 credits)
MCH 110	Blueprint Reading II	(1.5 credits)
MCH 120	Machine Shop Math	(2.5 credits)
MCH 125	Speeds and Feeds	(1.5 credits)
MCH 135	Basic Measuring Tools	(1.5 credits)
MCH 145	Layout Tools	(1.5 credits)
MCH 150	Precision Measuring Tools	(1.5 credits)
	Career Planning	(non-credit)

#### Term 2 Specializations

Manufacturing Technician	(14 credits)
Mechanical Inspector	(13.5 credits)
Sheet Metal Technician	(13.5 credits)

### Steps to Admission

1. Apply for Admission to PCC (\$25 fee).
2. Take the College placement exam. You can call one of the PCC testing centers listed here to schedule an exam:  
Cascade Campus, 503-978-5234; Rock Creek Campus, 503-614-7300;  
SE Center, 503-788-6256; Sylvania Campus, 503-977-4131.
3. Complete the PCC online student orientation.
4. Speak with the training contact.

### Contact

Andrew Roessler, 503-788-6271, [aroessler@pcc.edu](mailto:aroessler@pcc.edu)

For more detailed information visit our web page at [www.pcc.edu/cp](http://www.pcc.edu/cp)

Career Pathways Trainings are offered by the PCC/MHCC Dislocated Workers Program funded by Worksystems, Inc.

05516-002 12/04

Figure 9. PCC Machine Manufacturing Pathways Flyer.



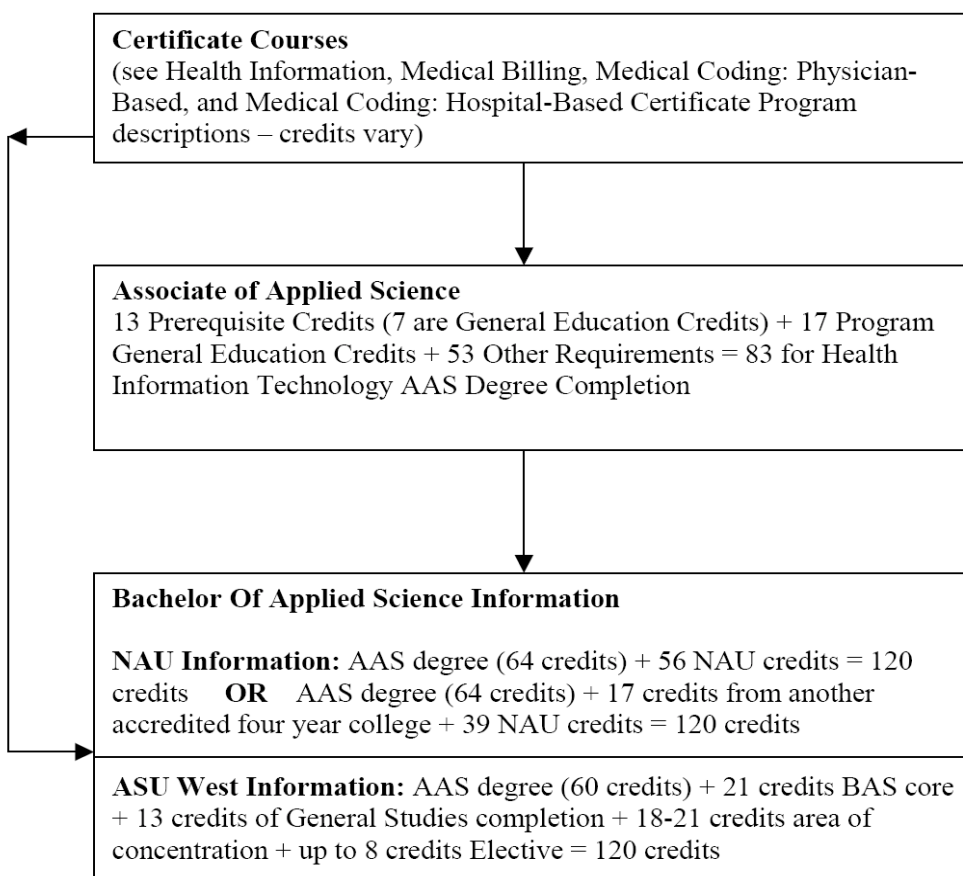
information, including a single telephone number which promised to help prospective students plan a future as a health care professional.

Phoenix College had a detailed brochure for each Allied Health Program, all of which included overviews of the program; employment opportunities and salary information; program prerequisites; a contact name and phone number; and a list of the ten reasons why a student should choose the program at Phoenix College, reason number six being “established pathways to other health programs.” Additional flyers explained how the certificate courses applied to the Associate degree, and how the Associate degree transferred to a Bachelor of Applied Science degree. As an example, the roadmap from the Health Information Technology Certificate to a Bachelor’s degree is included in Figure 10.

To summarize, all the programs studied developed written and electronic materials providing details about chunked programs and pathways in order to assist both the students and their advisors. This included designing program brochures, flyers, and handbooks, recognizing that students – and advisors – needed a visual depiction of the ways in which chunks led to pathways which led to certificates which led to degrees. One college also included high school as a part of the pathway. The electronic and written materials provided information such as details about classes and chunks, program overviews, cost, prerequisites, and steps to getting admitted, and included contact names, email addresses, and phone numbers. One college included employment opportunities and salary information, program prerequisites, and ten reasons why a student would want to select their programs; another college included

## HEALTH INFORMATION TECHNOLOGY – PHOENIX COLLEGE

The 70 credit Health Information Technology AAS Degree Program (plus 13 prerequisite credits) includes a combination of human science, computer technology, and health information courses that prepare individuals for employment in organizations that use or service healthcare information systems. Skills include compiling, processing, analyzing, evaluating, coding, storing, and retrieving health information consistent with medical, administrative, legal, accreditation, and regulatory requirements for health care organizations including privacy, security, and quality of health care data standards. The Program is accredited by the Commission on Accreditation of Allied Health Education Programs in collaboration with the American Health Information Management Association. The Program includes two semesters of professional practice experience in health care settings. Graduates of this Program are eligible to take the national examination to become a Registered Health Information Technician (RHIT).



Please contact [debi.moser@pcmail.maricopa.edu](mailto:debi.moser@pcmail.maricopa.edu) for additional information or assistance.

Figure 10. Phoenix College Health Information Technology pathway from certificate to Bachelor's degree.

an inventory to help students assess their own current skills and career interests.

*Financial aid designed for students in chunked programs.* Since financial support was identified as such a crucial issue for students in chunked programs, it was not surprising that programs created special scholarships and strategies to assist students in securing needed financial aid. Given the strong involvement of industry in the programs studied, the colleges have successfully negotiated with employers to provide tuition reimbursement for employees enrolled in the chunked programs. With the support of the Employer Advisor Committee, a scholarship for MMT students at PCC is administered through the college's Foundation, and was designed to be accessible to any MMT student – including those completing the short certificate program or EST. Maricopa's Health Care Education Administrator reported that “we have an incredible amount of financial support” for health care students because of the critical shortages in this field. This results in students who do not need to “stop out as much.”

In summary, traditional financial aid was usually unavailable to students in non-traditional programs, yet financial support was identified as a crucial issue for students in chunked programs. Thus, other types of financial assistance were negotiated. These took the form of special scholarships created by the programs, arrangements with a college's Foundation, and negotiations with employers that provided tuition assistance for students in targeted programs. Financial support for students was viewed as critical for recruitment and retention.

*Summary of Strategies to Resolve Student Issues.* The first five categories of response to *Research Question #2: How can the issues that arise when chunking be*

*resolved*, described strategies implemented by the colleges studied for resolving issues and barriers which related directly to student recruitment and retention.

- Program orientations introduced new and potential students to the expectations and requirements of the courses, the instructors, and the college, such as attendance requirements, assignment deadlines, and behavioral guidelines. They also introduced students to college services such as advising and special financial aid, and began the process of reducing students' fears of being new.
- Mandatory advising helped students assess whether their academic skills and goals were a good match for the program, and then helped students develop an educational plan, an academic schedule, a resume and job search strategies.
- Marketing materials such as program brochures, flyers and handbooks, both printed and electronic, assisted with program recruitment.
- Cohort groups were used to create a supportive atmosphere for students experiencing personal crises or stress from balancing multiple roles; but cohort groups also exerted peer pressure to encourage retention and deter would-be drop outs and extended stop-outs.
- Financial assistance for students in chunked programs came primarily from employers' tuition assistance programs as well as from program scholarships and Foundation funds; as one college reported "an incredible amount of financial support" was available to health care students due to critical shortages in that area. Financial aid was viewed as a student decision point in terms of both recruitment and retention.

### *Strategies to Resolve Institutional and External Issues*

This section describes strategies employed by the three colleges studied which addressed the institutional and external issues that arose in chunking professional-technical programs. Many of the strategies identified by interview participants were used to resolve both institutional and external issues, thus they are included together in this section. Each strategy is described below and examples are given of how the strategy operated and the issues it helped resolve.

*Changes in faculty workload design.* Changes made in how faculty workload was designed provided an opportunity for compensation of the extra work associated with chunked programs, as well as the method for calculating the class hours needed to create the workload associated with a full-time position. A faculty member in a chunked program built on a self-paced, open-entry, open-exit model told me: *“Each instructor has at least 15 classes because some classes might have four or five students and one might have 20 students. It balances out because sometimes another instructor is teaching my students and sometimes I’m teaching their students.”* This recalculation of workload had the added advantage of allowing classes with low enrollment to run. *“We never close a class for minimum enrollment. The self-paced nature of the program allows a class size of one”* (Faculty Department Chair).

Faculty, in my study, were often given course release time to develop or repackage curriculum for chunked programs.

*I had quite a bit of release time to develop the curriculum. We (the faculty) all had our different areas of expertise and that’s where we focused our efforts in developing the curriculum. I had more time, so I did probably about 75% of the development and the rest was parceled out to the rest of the folks, and then, everyone came together to review it and make changes – until we all felt comfortable with it.* (Faculty)

Faculty were also given release time on an ongoing basis for program advising, and for the administrative duties of department chair or program director, whose duties included coordination of the chunked program. One Faculty Chair was released from teaching to spend two days a week in the college's district office to work on program issues, and to work with district staff to ensure consistency and quality of the program throughout the district. Other colleges reported that they built in time for faculty meetings to discuss student issues, share information, review college changes, and conduct ongoing assessment. To summarize, changes in faculty workload designs provided opportunities for compensation of the extra workload associated with chunking, much of which translated into release time for developing and packaging the chunks, advising, and participation in program meetings. Recalculation of workloads associated with a full-time position had the added advantage of allowing classes to run with low enrollment.

*Faculty leadership in curriculum and program changes.* Faculty leadership was one of the most important elements responsible for the success of the curriculum and programmatic changes needed to make chunking work. A faculty program director told me: *“One of the mantras of our department is that it is better to ask for forgiveness than permission. The other – proceed until apprehended!”*

At Shoreline, I spoke with two faculty members – one teaches in a professional-technical program, the other teaches English to Developmental Education students. The English faculty had become something of an outcomes guru for the college, and regularly consulted with other faculty to develop rubrics for assessing student learning in courses and modules. She worked with the faculty member from

the professional-technical program, who was new to the college, and helped him develop assessment activities for all courses and modules in the new chunked program. This was reported to be one of the secrets of success in making chunking and pathways more recognized and respected among faculty across the institution. *“The only thing I needed to do was offer release time to put them together. I think the secret to it all is to get the technical and the liberal arts faculty together to co-develop and to team-teach together” (Administrator).*

One instructor reported that faculty, quite voluntarily, assumed leadership in the process of redesigning the curriculum to create chunks and pathways because they understood that they were *“creating something meaningful that made sense for our community and our students.”* She went on to say, *“it was a real give-and-take committee. It was almost all faculty – no deans. There were many faculty involved. One person had release time – everyone else just did it. It was new and exciting.”*

Another key leadership role for faculty was serving on college committees that provided an opportunity to learn about and influence curriculum and program approval decisions.

*I’ve been on the curriculum committee for eight years – and it makes a difference to be part of the process. I’m also co-chair of our instructional council for the past three years at district level. I understand the process – and I’m not afraid of it. (Faculty Department Chair)*

Professional pride and responsibility, along with an ethic of service were evident among faculty participants, particularly among the faculty at Phoenix College interviewed for my study. *“Maybe it says something about health professionals – we*

*see how this is going to affect the community and the health of its people” (Faculty Program Director).*

An administrator at Phoenix College told me:

*At the core, we have the most dedicated, hard-working professionals I’ve ever seen . . . very committed to their careers, their students, open to new ideas and innovation – they challenge themselves. When we’re talking about health occupations, they wanted to share what they knew because they were passionate about it.*

To summarize, leadership in curriculum and program changes was assumed by faculty in various disciplines, voluntarily or with release time. It evolved from their recognition of the time and effort required to make chunked programs work, motivated by professional pride, an ethic of service, and the excitement of creating something new and meaningful. They felt the key to their success in making chunking and pathways recognized and respected among faculty and administrators across their institutions was collaboration. Consulting with other faculty members, across disciplines, one-on-one and as members of committees, program leaders developed rubrics for assessing the effectiveness of courses and chunks, creating an atmosphere of collegial participation for both learning about and having a hand in influencing the curriculum and program process.

*Strong involvement of employers and advisory committees.* All of the colleges and programs studied relied heavily on employer advisory committees, not only to help drive the initial development of chunking, but also to assist in resolving issues as the chunked program was implemented. The advisory committees, working with faculty and administrative leaders, developed desired program outcomes based on industry-recognized skills. Interview participants understood their role to be one of



educating the advisory committee on the workings of the college and the educational system in general, at the same time providing advisory committee members with a vehicle through which they could influence the development of college programs.

*All the health occupation programs have very, very strong advisory boards. Advisory boards are not unusual at a community college; what is unusual here is the strength of these boards. These are dedicated professionals - doctors, nurses, phlebotomists, histologists – and all are willing to carve time out of their day to come to this campus to talk about their professions and talk about our programs, and make recommendations. They take their work very seriously – I’ve gone to all the advisory committees, and it’s amazing to see 20, 25, 30 dedicated professionals who are not just rubber-stamping recommendations, but are making recommendations, and are talking about what’s going on in their profession and their organizations. They are valued – they encourage and support the faculty and help with their currency. (Administrator)*

The advantage to the college was not only programs that better met industry needs, and therefore, better prepared students to be successful; the programs that had strong employer involvement also secured benefits such as space, instructors, and financial assistance for students in the form of scholarships. *“Our peers in the community, they have been so supportive of our program - in terms of mentoring students, being on the advisory board, offering scholarships” (Faculty Advisor).*

One of the challenges, identified in the earlier section on issues that occurred when chunking, was the perception that education does not respond quickly enough for employers. As a way to physically demonstrate that commitment, Shoreline created the Center for Manufacturing Excellence to function as a single point of entry for employers to access training opportunities at Washington’s community colleges, recruit trained workers, and collaborate in the development of an educational system that was responsive to the needs of manufacturing. As part of the Center, a Skills

Panel was created to function as a kind of super-advisory committee and was charged with developing the learning outcomes and curriculum for the new manufacturing program. *“Education wants to show industry that it doesn’t want industry to leave this area – or the country” (Faculty).*

To summarize, all of the colleges studied relied heavily on employers and their advisory committees to drive the initial development of chunking, and to assist in resolving issues as their programs were implemented. Acting as one of the crucial linchpins for program success, the employers’ advisory committees worked with faculty and administration to develop desired program outcomes based on industry-recognized standards and skills. This also helped mitigate employer perceptions that education cannot respond quickly enough for employers. As a tertiary benefit, the programs with strong employer involvement often received additional space, instructors, and financial assistance for students in the form of scholarships.

*Curriculum focused on skills and outcomes.* The identification of skills and competencies by faculty members, working with employer advisory members, drove the development of program outcomes, and those outcomes became the driving force behind the curriculum. Following meetings with key local employers, PCC’s Machine Manufacturing Technology program identified the necessary skill sets for employment in the Portland area. These skill sets were used to develop program and individual course outcomes, as well as the curriculum and materials needed to support instruction. The MMT program’s advisory committee, made up of local employers, regularly reviewed the skill sets, outcomes, and curriculum to ensure currency in meeting industry requirements.

Once Shoreline's Skills Panel, made up of local employers and community college staff, identified the key learning outcomes for the manufacturing certificate, *"we came up with the curriculum - ten core classes with multiple modules are required to complete the basic certificate in manufacturing"* (Faculty).

Faculty in the Medical Assisting program at Phoenix College completed an evaluation on each student in the program on "personal/professional performance competencies." These competencies included technical skills, as well as interpersonal and self-management skills. Students were required to achieve a minimum score of three, on a scale of one to five, on each of the 15 competencies before being placed in what was called an "externship" which was a requirement for program completion.

The development of chunked programs which are based on clearly identified skills and outcomes allowed the Phlebotomy program at Phoenix College to rapidly meet community needs.

*I have someone who called me from an HIV clinic; they now need to do a blood draw if there is a positive result from a swab, and they just want us to teach that skill. Since we have the skill sets established, and have actually broken the phlebotomy program courses into modules, we can provide just the piece that they need to learn the required skill. It's the ability to actually take it and meet the community need.*  
(Faculty Program Chair)

The advantage to the student, in terms of pathways to completion, was that the class they took in the community at the HIV Clinic was articulated back to PC and counted toward a Phlebotomy certificate. To summarize, once the employer advisory committees and the colleges' program advisory committees identified the desired program outcomes and individual course outcomes based on industry-recognized standards and skills, those outcomes became the driving force behind the curriculum.

The skill sets, course outcomes, and curricula were then reviewed regularly to evaluate rubrics for assessing student performance competencies, and to ensure currency in meeting industry requirements and community needs.

*Curriculum and scheduling flexibility.* Flexibility in the packaging of curriculum was demonstrated in numerous ways by study participants. Open-entry, open-exit, self-paced programs were developed which met the needs of both students and employers making instruction available when the student needs it and when the employer can afford to have the employee or student absent. The simulated shop area in PCC's MMT program was open 54 hours per week allowing students to attend school and complete the required courses, on almost any work or personal schedule. Students have up to one year to complete any classes they start, with the exception of students on some federal financial aid programs. Faculty at PCC expressed support for the chunks that have been bundled together to create flexible certificates called Employment Skills Training (EST) certificates. *"What I really like is the ability to do cross-departmental course planning and require courses from different departments. You can really fine-tune the types of skills that will benefit the student and the employer - a math class, a human relations class, etc."* (Faculty).

*In the traditional program, the only option was either a one or two-year certificate. With the new program, we still have those, but now have numerous options to get the required skills. We developed program awards initially, but now have the formal recognized EST. We've now had several people who have completed their two-year degree in four terms. For the motivated people, it really opens up a door. The thing that works about chunking - students know they can reach short-term goals and then go on to the bigger picture. Everything they take for the EST or the shorter certificate can be applied to the degree.* (Faculty)

The same instructor told me, *“It’s been very rewarding. It’s given me a lot of freedom.”*

Compressed, condensed scheduling was also used by programs to allow students to complete coursework in the shortest period of time. *“The Skills Center offers short, brush-up courses to get students ready for the LPN [Licensed Practical Nursing] courses – and they offer their own A&P [Anatomy and Physiology] courses – it’s just a few weeks” (Pathways Director).* Other programs employed block-scheduling of classes. For example, offering a three-credit class in a six-hour block for a five or six-week period.

Courses were re-packaged to address the need for the inclusion of some, but not all, of the content from individual courses. An administrator at Shoreline told me:

*Once the faculty got the hang of it, it’s just taken off. Business Technology faculty are breaking courses apart – to market internally on campus for current students: pieces of courses – not whole courses – for students needing certain skills such as word processing, spreadsheets, etc.*

From the very beginning, faculty at Phoenix College wanted students to have the maximum flexibility to move from a certificate program into a degree program.

*If our students want to move from here to a degree program, we wanted to make it as easy as possible. We split some courses because students taking one certificate or the other might not need everything in the four-credit course, so many classes were split into two-credit classes. (Faculty)*

Colleges have found creative ways to meet student needs, to increase student enrollment, and to secure approval for non-traditional courses. *“One college put a course description together that was really just tutoring – faculty got workload, students got the help they need. Some people didn’t like it, but some thought it was*

*brilliant” (Pathways Director)*. Arizona allowed colleges to expedite the curriculum approval process for classes needed to meet industry demand, identifying the class with the prefix IND (for industry). In an effort to deal with the difficulty of scheduling required general education classes for students in chunked programs, Washington now offers many of these courses through the internet for those pursuing an Associate degree.

To summarize, flexibility in curriculum and scheduling was achieved and demonstrated by the numerous ways in which programs were structured and rolled out to students. For example, open-entry, open-exit, self-paced programs met the needs of both student and employer in that instruction was available when the employer could afford the employee’s absence or when a particular skill set needed updating. Employment Skills Training (EST) certificates, formally recognized flexible certificates which can be applied toward a degree, involved cross-departmental planning to customize and fine tune the skill sets that best served both the student and the employer, the skills training was then bundled into chunks to create the certificate. Compressed, condensed scheduling allowed students to complete coursework in the shortest period of time; for example, in block-scheduling classes, a three-credit class was offered in a six-hour block for a five or six week period. Another college created a course dedicated to tutoring, giving workload to faculty and giving students the help they needed. One of the colleges abbreviated their curriculum and approval process, when industry changes needed quick turn-around, by identifying and fast tracking classes having an IND prefix. General Education course scheduling was solved at one of the colleges by making them available electronically.

*Securing external funding to support development of chunks and pathways.* All the colleges studied secured state or federal funding that supported the development of pathways and chunked curriculum as a way to alleviate some of the concerns associated with the issue of increasing costs for community college programs. Funding helped in hiring additional faculty and staff to support the development of the chunked programs. In 1990, Arizona voters approved Proposition 301 which increased the sales tax to support education. Every community college had an opportunity to apply for those dollars to meet new workforce and economic needs.

*When I started here, I wrote a Prop 301 grant for start-up funding for the Lab Assistant program. It's a one-year grant, with the option of a second year at 50% funding. The college does have to pick up the funding after the grant runs out. (Faculty Program Director)*

Another way programs built revenue to support chunked programs was through student fees. *"Lab fees are tied to the course – and come back to the program. We just raised our lab fees. In three years, we've added three faculty members"* (Faculty Program Director).

PCC has been successful in using WIA funding to build their infrastructure for pathways and chunking. This funding has supported staff positions and provided *"coordination and assistance to change the delivery of curriculum and coursework – repackaging the delivery and setting up a support system for students"* (Pathways Coordinator).

*I can offer them better student success. No one has ever contacted me in the four years I've been doing this and said "I don't want to do this again." If anything they say – "this is so much fun . . . I love your students . . . they're so motivated." (Pathways Coordinator)*

Shoreline secured state and federal grant money to support development of the programs included in my study as well. The grant money was used to re-start the Manufacturing program, and to create the Center for Manufacturing Excellence. *“The grant let us hire someone to work with the employers, and who didn’t work for the college. We were able to draw in a wide diversity of industries in manufacturing” (Faculty).* Shoreline had recently secured a Fund for the Improvement of Postsecondary Education (FIPSE) grant to continue their efforts in the Manufacturing program. The administrator responsible for Perkins funding at Shoreline told me that creation of state-approved certificates of completion has resulted in additional Perkins funding for Shoreline.

*The coding of completers is hooked to the Perkins funding; it brings in more money to my budget which buys more equipment and other things for the programs and the faculty, including tutoring help for students in computers, science, math, etc.*

To summarize, all colleges studied obtained state or federal funding in the form of grants such as FIPSE, WIA or Perkins funds, or, in one case, a sales tax levy primarily for hiring additional faculty to support the development of chunks and pathways. In one case lab fees tied to a particular course allowed the hiring of three faculty in as many years.

*Tracking and evaluation provided feedback and program improvement.* All colleges employed some sort of evaluation mechanism to secure feedback from students, employers, or both about their programs. All colleges tracked program completers. Shoreline, for instance invested in a staff position to search for students who have completed the courses making up the chunked certificate. Students are then



contacted to inform them that they have completed the certificate, and they can apply for graduation.

*When a student walks in the door – they identify what occupational area they’re interested in and registration assigns them a code. The Dean has a staff person who goes through the list of students each quarter, and based on their subject code, determines who has completed a short-term certificate. Faculty advisors get their list, based on the code assigned. (Staff)*

Phoenix College used the program evaluation process to investigate a decline in enrollment, and to determine changes needed.

*We saw some decline in our degree program. We actually did a program evaluation and surveyed students – it had a lot to do with the economy and the job market. Students were more likely working, and so we needed to change the scheduling of the program. More students wanted to attend part-time and evening. Now we alternate between day and evening – and offer two programs. Students also wanted more accessible courses –web or hybrid classes. When we started incorporating those things, we saw the enrollment increase. (Faculty Advisor)*

In summary, all colleges studied employed tracking and evaluation mechanisms to secure feedback about their programs from students who completed course evaluations and from employers through the employer advisory committees discussed above; and all colleges tracked program completers. One college used their program evaluation process to investigate a decline in enrollment, and determined that a re-arrangement of course scheduling would - and did - correct this.

*Strong institutional leadership and administrative support.* Finally, strong institutional leadership and administrative support was demonstrated at all the colleges through such strategies as the faculty release time referenced above, and by additional financial support for curriculum and professional development. *“This is the most supportive management I’ve ever worked with at the college – or anywhere. I had a*

*lot of responsibility as well as the authority – it's a good feeling to be entrepreneurial and be encouraged to be so" (Faculty).* Administrators interviewed spoke of their role as one of bringing resources to support innovations like chunking, and to support those individuals who are early adapters.

*Part of my job is to find those resources and support structures so that people don't feel overwhelmed. We have Perkins funds, DOI (Dean of Instruction) budget, and the district has an extensive professional growth system – money within the college system to send people to conferences, provide training, personal growth. I'm amazed the emphasis placed on professional development. You feel empowered here. Decision-making is not hierarchal – faculty control the curriculum. When something is a priority, it gets resources – that is demonstrated at Maricopa in professional development. (Administrator)*

Another administrator at a different college put it more succinctly.

*We're out there prodding the faculty. We use money. We look for the faculty that has high-energy, innovation – that wants to create change and better opportunities for their students. We build relationships, we build trust. Faculty drives it – they develop it, I help do the work for them.*

Sometimes these administrators found that the best way to create the changes needed to implement chunked curriculum and career pathways was just to “do it.” “I didn't go to anyone and ask if I could do this. I just started doing it through the faculty link, not through upper-administration” (Administrator).

However, there were many ways that colleges demonstrated upper-level administrative support for pathways and curriculum chunking. PCC included the development and implementation of Educational Pathways as an action item in its Educational Master Plan, and reported on its progress in PCC's annual report. At Maricopa, the District office provided staff to coordinate initiatives such as the

Healthcare Integrated Education System, and sponsored events designed to secure public input and support for key educational initiatives like pathways.

*Maricopa sponsored a “strategic conversation” with the Board of Governors, inviting people from industry to talk about it from their view: what skills do students need? What do employees need to know? All occupational deans were involved as well. And it didn’t just die after that night. It came back to occupational deans’ council to develop goals and action plans. The occupational deans’ council helps us get more feedback throughout our institutions, and the district office staffs it. (Administrator)*

To summarize, in spite of the fact that institutional leadership found little guidance for making the changes necessary to create pathways and chunked curriculum – and perhaps because of it -- they sought out faculty with high energy and the desire to create better opportunities for their students. Then they gave those individuals, and other “early adapters,” the time, the funds, the connections, and the decision-making authority to “flex their entrepreneurial muscles.” Administrators viewed their role as one of bringing in the resources, fostering relationships, and giving the programs credibility by, in one case, including them as action items on their Educational Master Plan and reporting program progress in their annual report. Another institution’s district office sponsored a “strategic conversation” among its Board of Governors, occupational deans, and industry representatives designed to secure input and support. The conversation became an ongoing feedback loop.

*Summary of strategies to resolve institutional and external issues.* To summarize, the following strategies were employed by the colleges studied to resolve the institutional and external issues that arose during adoption, design and implementation of chunking pathways to degree completion:

- Faculty workloads were changed to provide compensation for the extra work required.
- Faculty assumed leadership in curriculum and program changes motivated by professional pride, an ethic of service, and the excitement of creating something unique and meaningful.
- Strong involvement by employers and employer advisory committees provided one of the linchpins necessary to develop desired program outcomes based on industry-recognized standards.
- Curriculum was designed to focus on the identified skills and outcomes.
- Flexibility was built into curriculum and scheduling in various ways and for varying purposes, like making general education courses available online to help accommodate students' schedules, and devising ways to fast track the curriculum approval process to assure responsiveness to employer needs.
- New federal, state and local funding was secured to support the new programs.
- Tracking and evaluation processes provided feedback for program improvement.
- Strong institutional leadership and administrative support encouraged entrepreneurial thinking among faculty, fostered relationships with employers, and promoted and enhanced program credibility with stakeholders.

*Summary of Research Question #2: How Can The Issues That Arise When Chunking Be Resolved?*

The first five subsections of the response to Research Question #2 addressed strategies used to resolve student issues and barriers as identified in Research Question #1. Student issues revolved around or directly impacted student recruitment and

retention and included program orientations, use of cohort groups, special advising, materials designed to market chunked programs, and financial assistance for students in chunked programs.

The last eight subsections of response to Research Question #2 addressed strategies used to resolve institutional and external issues, also identified in Research Question #1. Institutional issues involved program design, workload distribution, faculty compensation, and leadership. External issues revolved around the partnerships created between employers and the colleges, creating ways to fast-track the curriculum approval processes insuring program flexibility and currency, and devising evaluation methods to provide feedback for program improvement. External issues also involved securing new funding sources to cover program costs and providing administrative leadership and support to promote and enhance program credibility among the various stakeholders.

*Research Question #3: What Guidelines Should Be Used When Implementing Chunking?*

The purpose of this section is to present the findings that respond to Research Question #3 as a way to give voice to the experience of those who have already developed chunked programs, and as a precursor to the presentation of more formal guidelines in Chapter 5. It is hoped that the preliminary guidelines presented here, and the formal guidelines in Chapter 5, help inform community colleges considering chunking as a way to build pathways to degree completion. These preliminary guidelines were suggested not only by the responses of study participants to interview questions about advice they would give to other community colleges seeking to successfully implement chunking, Research Question #3, but also by their responses to

Research Question #2 as to how their own institutions resolved the issues and barriers identified in Research Question #1. Materials provided by study participants such as college catalogs, program brochures, web sites, and curricular materials were also taken into consideration.

In general, participants cautioned that there was no single prescription that fits every college or program considering chunking. As one administrator put it, *“There is no one right way to do chunking. Each discipline is different and you need to treat each one individually.”* However, another participant suggested these principles to guide colleges considering chunking, *“Look at colleges already doing it [chunking], find resources to support it, secure the cooperation of leadership, and have a clear understanding of state and federal funding, and how chunking may impact it.”*

The preliminary guidelines fell into the following overarching themes that emerged during analysis of the data:

1. Guidelines to promote participation by faculty and staff in chunking at community colleges;
2. Guidelines for selection and design of chunked programs;
3. Guidelines to support students in chunked programs;
4. Guidelines to ensure connections to the labor market.

These four themes form the framework used to present the preliminary guidelines, based on responses to all three research questions. The following preliminary guidelines were used to build the more formal guidelines presented in Chapter 5.

*Preliminary Guidelines to Promote Participation in Chunking*

The three preliminary guidelines presented here emerged from the interview data in which participants reported direct experiences they had with increasing participation in chunking or suggestions they had for increasing participation: 1) create opportunities for connection and relationship-building among colleagues; 2) use resource allocation to encourage activities related to chunking; and 3) present information and examples to demonstrate how chunking works. The programmatic, curricular, and institutional changes necessary to implement chunked programs requires the participation of those who are employed by the college - administrators, faculty, and staff. An administrator told me: *“You must get the college stakeholders – other administrators, faculty – involved if the changes needed to make chunking work are going to happen.”*

*Create opportunities for connection and relationship-building.* The preliminary guidelines promoting participation in chunking include creating connections between those who are advocates of chunking and those who are either new to the practice or have a negative impression of chunking. The development of connections between colleagues, experienced with chunking and those new to it, increased confidence among those new to the concept that chunking was feasible and effective.

Creating connections and nurturing relationship-building among colleagues also helped foster the motivation, flexibility, and cooperation needed to design and implement chunking. *“Relationship-building is critical to the success of these programs . . . It’s all about relationships” (Pathways Director).* A faculty member

who functioned as a Program Director in an Allied Health program believed that the close relationships among peers in her program helped to “*create an energy and passion in what you do.*” Another participant reported that the sense of excitement was contagious when the faculty developed the first program chunks. “*Everyone was excited about it – it was new and exciting. There were no issues of turf. It was a real give-and-take. The faculty who worked on it got really excited and enthused about the changes.*” A participant, who is the only full-time faculty member in her department, told me that building relationships with colleagues in other departments helped her develop a broader view that eventually lead to the creation of chunks that combined courses from multiple departments.

*If you get in the rut of thinking it's all about you . . . that's where I started, but I moved away from that as I built relationships with other departments. You have to get outside yourself and look at the holistic picture; then you realize it's not about what you teach at all, it's about what the outcome is.*

This subsection explained how creating opportunities for connection and relationship-building among colleagues led to both enthusiasm for the process of working together to create program chunks, and cooperation in working through the details involved in the actual design of the chunks.

*Use resource allocation to encourage activities related to chunking.* Also under the theme of promoting participation, this preliminary guideline is related to reports by study participants that additional resources, at least at the inception of chunking, are needed. Additional resources provided rewards and incentives for faculty and staff to develop, implement, and maintain chunking and the supporting structures that make it effective. Examples of compensation, as reported by



participants were: release time from teaching; pay for extra hours; public recognition for those involved in chunking; financial support to attend conferences or visit other colleges implementing chunking; equipment or supplies for programs implementing chunking; and additional staff or faculty assigned to chunked programs. An administrator told me that “*you’ve got to incentivise (sic) this stuff* [chunking development] *with release time, conferences, pay for development, etc.*” One program studied employed an instructional support staff member who assists faculty by grading assignments, filing grades, making copies, and ordering supplies as needed. The same program included an advisor who spends a significant amount of time consulting with faculty to develop strategies when issues interfered with students’ progress in the program.

Resources were used to foster ownership of chunking and to encourage faculty involvement in college committees and other activities. Involvement in the larger college community resulted in both increased understanding of how the institution operated and increased confidence among faculty that they knew the actions required to make the program and curricular changes needed for chunking. A Faculty Department Chair reported on her involvement in district-wide committees:

*I’ve been on the curriculum committee for eight years, and it makes a difference to be part of the process. I’ve also been co-chair of our instructional council at the district level for three years. I understand the process – and I’m not afraid of it.*

Using incentives to foster connections to professional organizations encouraged a broader perspective and kept faculty current on industry and employer needs and standards, both important for the success of chunked programs. Incentives were also used to encourage networking, within and outside the college, to share best

practices, encourage adoption, and observe successful models of chunking. A faculty member told me that her campus administration supported her participation in professional associations, and that this participation was important to the success of the program. *“Faculty involvement in our state and national association – that really has helped the success of our program. When we have to travel for councils or accreditation visits, our campus is very supportive – and they encourage that.”*

Occasionally, participants reported that reductions in resources also encouraged participation in chunking. Both of the manufacturing programs included as part of my study used chunking to create short certificates, along with the adoption of a self-paced schedule, as a necessary innovation to save the programs from permanent reductions and possible closure. A faculty member from one of the programs told me that they had *“lost one position because of declining enrollment.”* This was corroborated by the administrator responsible for the program who told me that the reason they adopted the new program design was because of declining enrollments and the *“risk of closing the program down.”* This subsection presented the second preliminary guideline to promote participation in chunking at community colleges detailing how an increase or threatened decrease in resources to college programs can be an effective incentive to participate in chunking.

*Present information and examples to demonstrate how chunking works.*

Providing details of how chunking could be accomplished was critical to promoting participation, acceptance, and its adoption at the three colleges studied. It was particularly important that faculty-to-faculty connections were made for the purpose of sharing the benefits of chunking and the specifics of how it was accomplished.

However, it was also important that faculty understood how chunking fit into the larger college system, so that they could be mindful of possible impacts on students, other departments, and college systems. *“Put a system together of how you do this. You need to find someone who can work with faculty and understand the college’s data system – and then interact with both faculty and data staff” (Administrator).*

A faculty member who served as Department Chair during the redesign of the manufacturing program explained that a visit to another community college, which had implemented a design similar to the one PCC was considering, was key to convincing him that the design could be successful at PCC. *“We went and saw what other people were doing. We borrowed parts that were good, and we developed others.”*

Faculty, staff, and administrators interviewed in my study believed that chunking produced positive outcomes, and that connecting chunking to those outcomes influenced its acceptance by faculty and other stakeholders. Creating an opportunity to share stories of how curriculum chunks and pathways lead to improved completion rates, student success, upgrading of skills, encouraging life-long learning, meeting community needs, and maintaining the health and vitality of the discipline or profession, is an important guideline for colleges to consider. *“It’s so exciting to know that you’re truly making a difference in the industry and the community. It’s about flourishing, not just sustaining, the programs” (Faculty Program Director).*

To summarize, this subsection explained that presenting information and examples of chunking to college stakeholders was an effective way to promote participation in its implementation. Information and examples should include specifics at the program

and college systems level, as well as explicit connection to the outcomes that are achieved by chunking.

*Summary of preliminary guidelines to promote participation in chunking.*

This section presented the three preliminary guidelines drawn from interview data in which participants reported direct experiences they had with increasing participation in chunking, or suggestions they had for increasing participation. Creating opportunities for connection and relationship-building among colleagues led to enthusiasm for the process of working together to create program chunks and cooperation in working through the details involved in the actual design of the chunks. Participation in chunking was also promoted through increased program resources, as well as actual or threatened decreases in program resources. Examples of resources included financial compensation, additional staffing, public recognition, equipment and supplies, and support of professional development activities. Occasionally, participants reported that the incentive to participate in chunking resulted from an effort to save the program from reductions or closure. Information and examples that demonstrated how chunking worked were used to provide a roadmap to implement chunking at the program and college level, as well as to connect chunking to improved outcomes. In summary, the preliminary guidelines proposed to increase participation in chunking highlight the importance of furnishing the needed resources to support and recognize the efforts of those implementing chunking, thereby building confidence among the early adopters and attracting others, as the administrator below put it, to “*jump in.*”

*Work with the champions among the faculty – who is most creative and innovative first, and then, once the old-guard, recalcitrant faculty see*

*what's going on, they'll jump in. Let faculty who are innovative and have had success be the champions. It just works so much better when it's faculty-to-faculty. (Administrator)*

I close this section with a final piece of advice from one of the interview participants:

*“Quit trying to please everybody – just go out and do it!”*

### *Preliminary Guidelines for Selection and Design of Chunked Programs*

This section presents preliminary guidelines for the selection and design of chunked programs: 1) likelihood of employment within one to three terms should drive program selection; 2) a single design for chunked programs is not feasible; 3) utilize existing college structures; 4) carefully plan course sequencing; and 5) consider alternative scheduling and delivery. The purpose of this section is to give guidance to those that are considering how to select and design chunked programs, and to underscore the experiences of the three case study sites which highlighted the importance of flexibility, thoughtfulness, and avoiding redundancy.

*Likelihood of employment within one to three terms should drive program selection.* Employment in a short period of time was important for many of the students interested in chunked programs. *“Students come here to get skills and get a job” (Administrator).* In selecting programs that are most appropriate for chunking, participants advised looking at those programs offering the best employment opportunities, perhaps even those programs in which students drop-out because they can find a job without a credential. *“Look for successful and non-successful programs – both can be fertile ground - programs where students are already stopping out to get a job” (Pathways Coordinator).*

The other consideration in program selection was the length of time it takes to complete a chunk and secure employment. The programs most suitable for chunking, according to participants, were those that did not require students to complete numerous prerequisite courses prior to enrollment in the chunked program. *“Look at what students can get into that doesn’t have a lot of prerequisites – where they don’t need a year of biology or English, for example. What can you do in a term or two that would lead to employment”* (Pathways Coordinator). To summarize, colleges should recognize that employment in a short period of time is important to students and selection of programs most suitable for chunking should be based on those with good employment prospects and those that do not require numerous prerequisite courses.

*A single design for chunked programs is not feasible.* Development of preliminary guidelines for the design of chunked programs is difficult, given the complex interplay of the student, institutional, and external issues identified by study participants and reported in the findings to research question #2. Most participants would agree with the Pathways Coordinator who said, *“There’s no great model. No one right way to do it.”* Another participant struggled when asked about the advice she would give to guide other colleges in the design of chunks:

*When we chunk, we become very competency-based. That means that you begin to look more at what are the overall skills students need – and you need a more holistic approach to the overall curriculum, especially when chunking. What’s happening is a revisiting of education – we aren’t just teaching you how to perform the skills, but how students learn those softer skills – team skills, communication, diversity. (Administrator)*

This administrator frames the issue of why a single design for chunked programs is so difficult – the chunked programs do not simply teach a student how to perform a

discrete skill; they teach skills within a larger context and must adapt and adjust to the changing needs of the student and the community. Another participant expressed a similar opinion based on the differences between occupational program areas.

*“There’s no one right way to do it. Each discipline is different – you need to treat each one individually” (Administrator).*

A Faculty Department Chair believed that programs should maintain the flexibility to create credentialed chunks to meet the needs of an individual student, an instructor, or an employer, *“Offer a variety of different types of certificates: self-designed, instructor-designed, and business-designed.”* Self-designed certificates referred to an individual who may want to take a certain chunk of classes leading to a specific job, yet would like a college credential. An instructor-designed certificate was a chunk designed by faculty, based on their knowledge of the industry and employment trends. A business-designed certificate referred to a chunk custom-designed for an employer needing a worker trained in a specific set of skills, yet also wanting a college credential upon completion of the chunk. Oregon’s Employment Skills Training (EST) certificate, discussed earlier in the Findings section that described PCC, was an example of an approach to chunking that can be student-designed, instructor-designed, or business-designed, as long as the chunk created connects to a job available in the labor market.

Four different designs were used by the three colleges included in my study and are included here as way to illustrate the range of options available for the design of chunked programs:

- Open-entry, open-exit, self-paced was the most flexible of the models examined. This was the design employed by the Manufacturing Technology program at SCC and the Machine Manufacturing Program at PCC.
- A compressed, condensed model allowed students to quickly accumulate credits, but required a workday-type schedule of six to eight hours per day in classes. This design was used in the Medical Assisting, Phlebotomy, Patient Care Technician, and Lab Assisting Programs at Phoenix College.
- Packaging existing courses as a chunk, with no changes to the existing schedule, allowed students to pursue the new, shorter credential, but did not require any curricular or scheduling changes for the college. The Visual Communications Technology Program at SCC was an example of this design.
- Redesign and re-packaging of curriculum meant that some courses were split apart (a four-credit class became two two-credit classes), or that new courses, or modules of a course, were developed to meet the need for instruction in a specific skill. The Health Information Technology Program at Phoenix College is an example of this design.

What can be concluded from the data gathered to this point is that, clearly, no single prescription can be imposed on all professional-technical programs considering how to design chunks. In summary, there were four designs from my study that can be considered when chunking, but colleges should be cautious in thinking that a single design will fit all professional-technical programs. Colleges interested in chunking should acknowledge that a single design is unlikely to be effective for all programs, and that the uniqueness of each program should drive the actual design of the chunks.



*Utilize existing college structures to align chunking with instruction.* It may be tempting for colleges undertaking a new initiative like chunking, to create new committees to plan, design, and roll-out chunking. However, this preliminary guideline drawn from interview participants suggests that it is more effective to make use of existing committee structures within the institution, rather than create new groups to develop chunking and pathways.

*Maricopa created a bunch of councils when they started this. It was just one more meeting. My advice is to work with the already established councils and committees, rather than create another system of committees. Don't set up a separate structure – fit it into the existing structures. (Director)*

It is also important that the existing group or groups charged with the design of chunked programs be closely aligned with instruction.

*I don't think it would be problematic now for this to sit in the workforce development part of college, instead of instruction – but, I think that would have been a mistake at first. I don't think the program would have had the credibility with faculty. Now we've built relationships and developed trust. (Director)*

In summary, use of existing instructional-affiliated groups, such as subject-area faculty committees, advisory committees, or other groups, conferred credibility to the idea of chunking and garnered support for the resulting design developed.

*Carefully plan course sequencing.* Chunking a professional – technical program to create credentials leading to a degree needs careful consideration of course sequencing to avoid the problem of students taking courses for one chunk which do not articulate to the next chunk or to the overall degree. Course sequencing should be connected to the larger goal of designing a system of interconnected chunks that lead to degrees. “*We've got to look at the big picture. You've got to design the program*

*with the end result in mind. How can we make the pieces fit and how can we make them work together . . . that global perspective” (Faculty Chair).* Another participant who works as a liaison to business suggested that it is essential to create a “*coherent sequence of courses that allows the kind of flexibility needed for workers and business.*” A Faculty Department Chair explained the importance of faculty, who teach the separate courses that comprise each chunk, working together to ensure coherence from one course to another.

*We have to change and experiment with new ways to make the chunks work. When a class is a pre-requisite for another class, and the skills build on from the one to the other, the faculty teaching those classes must work together to determine the best way to sequence the courses to make sure students have the skills to be successful in each course – and in the overall program.*

To summarize, course sequencing should take place within the larger context of chunking and pathways, and with an understanding of the end result desired. It is important to recognize the complex interplay between the courses that make up each chunk, and the need for faculty to work collaboratively to ensure that students have the necessary skills to move from one course to the next in each chunk.

*Consider alternative scheduling and delivery.* Many participants believed that alternative scheduling was a key to making chunked programs more accessible and more manageable for students struggling to balance school, work, and family because they allow students to complete a chunk in a shorter period of time than a traditional schedule. The Pathways Coordinator at PCC explained the importance of scheduling chunks in such a way that students perceived each chunk as short enough to be achievable:

*Have the pieces be small enough that they [students] believe they can make it . . . “I’ve only got 6 more weeks – I could take the bus for 6 weeks or I could get a ride for 6 weeks . . . but, if I’ve got 2 more years, I might as well stop now.” (Pathways Coordinator)*

Condensing the program was a common suggestion by participants to allow students to complete the program in a shorter period of time. A Faculty Advisor identified prerequisite classes as greatly adding to the length of time it took for students to complete a certificate. She recommended developing an intensive, concentrated program of study that would schedule both the prerequisite courses and the program courses to permit students to complete a certificate in six to nine months.

*I think the key is condensed programs. Ideally, we should condense the curriculum so that students could do the certificate in six to nine months – a highly concentrated format. It may be better if the students could do the building (pre-requisite) coursework in the first month in a highly concentrated manner. (Faculty Advisor)*

Alternative delivery of curriculum was suggested by a participant who had taught in an automotive program before working with the Manufacturing Technology program. He believed that availability of program curriculum anytime students want it should be the goal, and to accomplish that, colleges should modularize the curriculum and put as much online as possible. *“Modularize and individualize the curriculum – put into distance modality – make the subject available anytime.”*

Another participant suggested block-scheduling of classes as a way to better meet the needs of students. *“Scheduling - offer a sequence of classes - chunks - in morning, afternoon, evening, and weekend blocks. Students then can plan their life – knowing they’ll be attending from 1:00 to 4:00 everyday, for example” (Pathways Coordinator).* Finally, the Pathways Coordinator at PCC believed that scheduling could be used to increase a sense of purpose for students, that they are part of a

program that connects to their goals, “*Scheduling needs to happen in such a way that students feel like they are in a program that leads to something – not just taking a random series of courses.*”

This subsection presented alternative scheduling and delivery as a preliminary guideline for the design of chunked programs. Participants suggested that colleges should consider condensing the program to allow students to complete in a shorter time, breaking classes into modules, online instruction, and block-scheduling of classes.

*Summary of Preliminary Guidelines for Selection and Design of Chunked Programs.*

This section presented preliminary guidelines drawn from interview data in which participants reported direct experiences with, or offered suggestions for, the selection and design of chunked programs. First, the likelihood of employment within one to three terms should drive program selection. Second, expecting a single design to be adequate for all chunked programs is not feasible. However, four primary designs were identified: an open-entry, open-exit, self-paced program maximized flexibility and worked well for the manufacturing programs; the compressed, condensed model was intense but brief and worked for many of the medical programs; packaging existing courses as a chunk toward a new, shorter credential required no curricular change for the visual technology program; and redesign and repackaging showed flexibility in efficiently meeting the need for a specific skill, and was used in the Health Information Technology Program. Third, the use of existing committee structures to select, design, and approve chunked programs was found to be more successful than creating new ones, and the committees should be closely aligned with

instruction to assure credibility with faculty. Fourth, faculty need to work collaboratively to assure thoughtfully planned course sequencing with an understanding of the desired end result. And fifth, participants believed that alternative scheduling was key to making the chunked programs more accessible.

*Preliminary Guidelines to Support Students in Chunked Programs*

The purpose of this section is to present preliminary guidelines that may aid in the recruitment and retention of students in chunked programs. As was reported in the findings of Research Question #1, significant issues affect the ability of students to access and complete chunked programs. As one faculty member reported when asked about issues that arise in chunked programs:

*Instructors deal with many issues in the classroom: basic skill deficiencies . . . mental health issues and other disabilities . . . international students without good English language skills. Child care – especially drop-in care is also a problem for many students.  
(Instructor)*

Four preliminary guidelines were developed to support students in chunked programs, based on an analysis of participant interview data: 1) create opportunities to build student-to-student relationships; 2) build connections between students and faculty or staff; 3) develop and disseminate information about pathways and chunking; and 4) provide financial assistance for education and related costs.

*Create opportunities to build student-to-student relationships.* Relationships with other students help build a support system that can create a sense of inclusion, and can provide a network of other students to call upon when facing situations that might interfere with school attendance. As one participant put it, “*the best support is if students know each other – they’ll support each other to stay in school - whether it’s*

*homework or rides” (Pathways Coordinator).* This same participant advised those who are looking at ways to implement chunking to *“put whatever structure in place to support that relationship-building among students.”* Cohort groups were the primary means used in the programs studied to encourage the building of relationships among students. *“When you have something like a cohort model, with those support structures, students really benefit from those relationships with each other, as well as the faculty member” (Administrator).* In summary, colleges considering chunking should consider cohorts or other structures that build relationships among students to foster a sense of belonging and to help each other resolve issues that may affect attendance.

*Build connections between students and faculty or staff.* Truesdell (1996), in her research on community college students pursuing a pathway to a Bachelor degree who had not intended to transfer after completing an Associate degree, found that supportive faculty can facilitate a sense of connection for students, and that this can encourage students to continue on their educational pathway. A faculty member who was part of a program that used an open-entry, open-exit, self-paced model supported Truesdell’s finding, saying he believed it was *“easier to encourage students in the one-to-one format”* established for the program. He went on to report that the format allowed faculty to connect more closely with students:

*In the traditional class format, you may not get to know students well, but when you see students everyday, we get to know them really fast. So, you can identify those that aren’t coming in and work with them more when they do come in – and advise them of how much time it does take to learn the material.*

Connections with students helped faculty identify those students who needed more help to acquire the material and learn the skills necessary to complete the program and secure employment.

Another way connections were built with students, beyond one-to-one interactions, was the creation of cohort groups, as suggested by the administrator who observed that *“when there is something like a cohort structure . . . students really benefit from those relationships with each other, as well as the faculty member.”* The Pathways Coordinator at another college believed that faculty and staff who *“celebrate every little step along the way”* encouraged students to stick with a program, even if problems arose. The connection between student and faculty or staff was critical when students were just beginning a chunked program, and did not feel confident in their academic ability. *“We don’t say to a child learning to walk - come back when you can run. No, we celebrate that first step. There’s not much difference in this”* (Pathways Coordinator). To summarize, encouraging connections between students and faculty was offered as a preliminary guideline because participants believed it was an effective way to assess student learning, offer advising or instruction tailored to student needs, and improve student confidence.

*Develop and disseminate information about pathways and chunking.* Once a program has developed chunks, information and materials must be developed to make the overall pathway, each chunk, and the sequence of courses transparent and easy to navigate. Several examples of materials were provided by interview participants including flyers, brochures, websites, student handbooks, and advising worksheets. Dissemination of information and material was critical to students discovering

chunked programs, as well as encouraging students to return to pursue additional chunks. *“Recruitment is a challenge. That’s one of our biggest problems is getting the word out that we’re here – people aren’t that familiar with this (chunking)” (Faculty Department Chair).* Another participant explained that disseminating information about options like web-based classes may encourage students to return to complete additional chunks, *“We could do a better job of communicating how students can continue to take classes after they get a job – the availability of distance education, for example” (Pathways Coordinator).* He also suggested that individual programs or departments should contact students who have enrolled in past classes to market the next set of classes, *“We could do marketing at the department level – call students who’ve enrolled in other classes and encourage them to take the next chunk.”*

One specific recommendation to disseminate information about chunking was to redesign the schedule of classes and list all courses included in each chunk, with the opportunity to register for all the classes in the chunk. The Pathways Coordinator at PCC suggested that publishing the schedule in this format would better support students in planning an educational pathway leading to the outcome of degree completion:

*The schedule we do is so artificial. It has nothing to do with outcomes. And we wouldn’t have to change anything, we would just publish it differently – and we’d just have to commit that the courses are scheduled for the following term.*

In summary, development and dissemination of materials about pathways and chunking is presented as a preliminary guideline for colleges implementing chunking because it is necessary to inform prospective students about chunking as an



educational option, and to encourage former students to return to continue their pathway to degree completion.

*Provide financial assistance for education and related costs.* Given the inflexibility of federal financial aid policies that prevented many students in chunked programs from qualifying for aid, colleges implementing chunking should consider developing scholarships, grants, and loans that are specific to the chunked programs. Employers and professional associations were promising sources of funding for the development of special financial assistance programs. *“Our peers in the community have been so supportive in terms of . . . offering scholarships to students” (Faculty Advisor).* *“We’ve sent up an industry-sponsored scholarship through the PCC Foundation for students in the program” (Faculty).* Another participant reported developing a special scholarship through the college’s foundation, *“We’ve set up an industry-sponsored scholarship through the PCC Foundation for students in the program” (Faculty).* In summary, financial assistance to students in chunked programs is a critical element in improving access to and retention of students in the programs.

#### *Summary of Preliminary Guidelines to Support Students in Chunked Programs*

*The important thing is how to help students get through and get a job, and how to build a support system, and then, encourage them to come back – make it easy for them to see the next chunk. (Pathways Coordinator)*

This section presented four preliminary guidelines which may aid in the recruitment and retention of students in chunked programs, based on an analysis of participant interview data. First, creating opportunities to build student-to-student relationships formally, as in cohort groups, or informally, enhances a student’s sense of belonging,

and provides a network of other students who can be called on for help and who will support each other to stay in school. Second, building connections among students and faculty, staff or both, can facilitate a sense of connection that encourages students to stay on track, helps faculty identify students who may need more help, especially in the beginning when students may feel less confident in their academic ability, and makes it easier for the student to ask for advice or advising. Third, developing and disseminating information about chunking and pathways, certificates and degrees, alternative schedules, web-based classes, and navigating the system, in clear and multiple formats, is necessary to inform new or returning students about their educational options or the next step on pathways already started. And, fourth, due to inflexible state and federal financial aid policies, providing students with other financial assistance for education and related costs, in the form of scholarships or employer tuition remissions, is critical for recruitment and retention.

*Preliminary Guidelines to Ensure Connection to the Labor Market*

This section presents three preliminary guidelines to ensure that colleges implementing chunking have adequate connections to the labor market so that the chunks developed adequately prepare students for employment: 1) increase knowledge of specific occupations and of the labor market in general; 2) build substantive industry partnerships with key decision-makers; 3) market chunked programs as a benefit to business.

*Increase knowledge of specific occupations and of the labor market in general.*

Faculty and staff at community colleges should have an understanding of the labor market and economic cycles in order to advise students about how these factors can

influence their work lives. As one administrator told me, *“It means we, as community colleges, need to be very familiar and conversant with the opportunities that are out there – the more each of us knows about the careers and credentials out there, the better for our student”* (Administrator). She went on to explain how labor market and occupational knowledge was demonstrated in the classroom:

*What faculty here tries to do in the classroom is help students understand the value of what they are doing – in terms of their life, not just their job. And the transferability or portability of skills – if I do this in profession A, then I can adapt this to profession B - build on what we’ve done before. This can be very beneficial for our students.*

A Faculty Program Director from PC acquired job descriptions as a way to secure specific occupational information and assure that the curriculum prepared students to perform the essential job skills. *“Get job descriptions from your partners in industry – or develop a job description from agreed-upon skill sets developed with your community partners.”* To summarize this preliminary guideline, faculty and staff in chunked programs should acquire knowledge of specific occupations and the labor market in general in order to provide advising to students, and instruction that teaches specific skills, as well as an understanding of how those skills may be transferable to other occupational areas.

*Build substantive industry partnerships with key decision-makers.* Participants were in agreement that *“it is crucial to develop partnerships and relationships with your colleagues and peers that are out working in the community in your particular discipline”* (Faculty Advisor). However, it was even more critical for the success of the program to have the participation and support of high-level decision-makers from industry who have the authority to commit resources and make hiring decisions. *“You*

*need the top level decision-makers who can make the deal” (Faculty Program Director).* Suggestions for ways to build substantive partnerships with industry included offering laboratory and practicum experiences at industry locations such as medical facilities. *“Occupational programs that require a lot of labs - industry is willing to look at how we can use their resources. And practicum experiences that tie in to business and industry and making those real-life experiences available to students” (Administrator).* Another suggestion made by a faculty member at SCC was to make use of industry experts to design and teach classes or portions of classes:

*We want to use subject-matter-experts from the companies who are on the Skills Panel to help us build the courses and to use real examples from their industry. We want to have these experts come in and teach part or all of a module.*

In summary, substantive industry partnerships, particularly with high-level decision-makers, is a preliminary guideline designed to build and foster strong connections to the labor market, thereby ensuring the likelihood that students will be well prepared for employment. The final advice on working with business and industry came from an instructor addressing the perception that education moves too slowly for business, *“be responsive; don’t drag your feet. Put stuff together quickly. Industry doesn’t have the patience for endless committee meetings. Put it together, we’ll fix it along the way” (Faculty).*

*Market chunked programs as a benefit to business.* Marketing chunked programs as a benefit to business is the final preliminary guideline suggested to ensure connections to the labor market. This strategy was only mentioned by one participant, but it seemed a particularly unique approach intended to increase the number of students who pursue higher education with the support of their employer. As the

Pathways Coordinator suggested, “*PCC should be marketing to employers as an employee-assistance benefit. We’ll offer you, as an employer, a package for your employees to enhance their skills*” (Pathways Coordinator). This participant believed that marketing a chunked program as a package to employers would show that the college is “*responsive to the needs of business and builds support for education – and for community colleges.*”

#### *Summary of Preliminary Guidelines to Ensure Connection to the Labor Market*

This section presented discussion and comments drawn from interview data regarding the need to ensure that colleges implementing chunking have adequate knowledge of and connections with the labor market in order to adequately prepare students for employment. Three preliminary guidelines emerged.

First, knowledge of specific occupations and of the labor market in general must remain current in order to adequately teach and advise students. For one college this was simply a matter of collecting job descriptions which helped them evaluate curriculum based on the required skill sets set forth in them. Second, building and nurturing substantive industry partnerships with key decision-makers who have the authority to commit resources, such as scholarships or industry experts to help design a chunk or teach a class, increased the likelihood that students were appropriately prepared for employment in those areas. And, third, it was suggested that marketing chunked programs as a benefit to business, perhaps as a skill enhancement package, would help keep employers involved and build credibility that the programs are responsive to employers’ needs.

In summary it was suggested by participants that the success of chunked programs hinged at least partly upon the college's knowledge of and connections with the labor market in order to maintain instructional currency and expand program resources, and that marketing the chunked programs to employers as skills enhancement packages benefiting business would encourage the involvement of business and the credibility of the program in meeting business needs.

*Summary of Research Question #3: What Guidelines Should Be Used When Implementing Chunking?*

The findings in response to Research Question #3, the guidelines used when implementing chunking, were used as a way to give voice to the experience of those who have already developed chunked programs, and as a precursor to the presentation of more formal guidelines in Chapter 5, as part of the implications for practice. It is hoped that the preliminary guidelines presented in this section, and the formal guidelines in Chapter 5, help inform community colleges considering chunking as a way to build pathways to degree completion.

The preliminary guidelines fell into the following overarching themes that emerged during analysis of the data:

1. Preliminary guidelines to promote participation by faculty and staff in chunking. Increasing participation in chunking highlighted the importance of furnishing the needed resources to support and recognize the efforts of those implementing chunking, thereby building enthusiasm and confidence among the early adopters and attracting others, to the process of working cooperatively to create program chunks.

2. Preliminary guidelines for selection and design of chunked programs. In general, participants cautioned that there was no single prescription that fits every college or program considering chunking. However, they recommended that the likelihood of employment within one to three terms should drive program selection. Four primary designs were identified in the three community colleges included in my study: an open-entry, open-exit, self-paced design; a model that offered compressed, condensed coursework; packaging of existing courses as a chunk toward a new, shorter credential; and redesigned and repackaged curriculum. The use of existing committee structures, closely aligned with instruction, to select and design chunked programs was suggested to avoid duplication of efforts and to assure credibility with faculty. Faculty working collaboratively to assure thoughtfully planned course sequencing which included alternative scheduling was seen as crucial to making chunked programs more accessible and to enable smooth articulation for students from chunks to degrees.

3. Preliminary guidelines to support students in chunked programs. Participants suggested several guidelines they believed would aid in the recruitment and retention of students in chunked programs including: development of student-to-student relationships; improving connections between students and faculty or staff; development and dissemination of information about navigating the system of chunking and pathways; and providing students in chunked programs with financial assistance outside of the traditional financial aid system.

4. Preliminary guidelines to ensure connections to the labor market. It was suggested by study participants that the success of chunked programs was dependent

upon the college's knowledge of and connections with the labor market in order to maintain instructional currency and expand program resources. Although only mentioned by one participant, marketing the chunked programs to employers as skills enhancement packages benefiting business would encourage the involvement of business and enhance the credibility of the program in meeting business needs.

### Summary of Presentation of Findings

This chapter presented an overview of the findings, introduced the three case study sites, portrayed the data in response to the research questions, and drew on other corroborating evidence taken from college catalogs, program brochures, college web sites, curricular materials, and reports provided by study participants. The colleges selected represented institutions of varying size, organizational structures, geographical locations, and student demographics. The programs examined within each college provided a range of occupational areas including health care, manufacturing, and visual arts.

The three research questions provided the framework to explore the practice of chunking professional-technical programs to create pathways that promote degree completion in community colleges. The findings associated with Research Question #1 revealed three main categories of issues that need to be anticipated when chunking professional-technical programs or degrees: student issues, institutional issues, and external issues. Research Question #2 presented strategies used by the colleges studied to resolve the issues that arose when chunking. The findings relative to Research Question #3, the guidelines used when implementing chunking, were used as a way to give voice to the experience of those who have already developed chunked programs,



and as a precursor to the presentation of formal guidelines in Chapter 5. The preliminary guidelines were organized into four overarching themes: 1) preliminary guidelines to promote participation by faculty and staff in chunking; 2) preliminary guidelines for selection and design of chunked programs; 3) preliminary guidelines to support students in chunked programs; 4) preliminary guidelines to ensure connections to the labor market. A summary of the findings in response to the three research questions is presented in Figure 11. Each issue that arose when chunking (Research Question #1) is numbered and correlated with the findings of Research Question #2 (strategies implemented) and Research Question #3 (guidelines suggested) by listing the corresponding number parenthetically of the issue to which it mostly closely relates.

Summary of Findings in Response to Research Questions		
Research Question #1: Issues identified	Research Question #2: Strategies implemented	Research Question #3: Guidelines suggested
1. Appearance of personal crises	Program orientations for new students (1, 4)	Create opportunities to build student-to student relationships (1, 2, 4)
2. Pressures relating to balancing multiple life roles	Use of cohort groups (1, 2)	Build connections between students and faculty or staff (1, 2, 4, 8)
3. Lack of basic skills	Program specific advisors and mandatory student advising (3, 8, 12)	Develop and disseminate information about pathways and chunking (5, 6, 13, 15)
4. Fear of academic failure.	Materials developed to provide details about the chunked programs and pathways (5, 6)	Provide financial assistance for education and related costs (1)
5. Mismatch between goals of student and goals of college	Financial aid designed for students in chunked programs (1)	Create opportunities for connection and relationship-building among colleagues (9, 11, 17)
6. Misperceptions or misinformation affecting occupational or educational choice	Changes in how faculty was organized and calculated (9)	Use resource allocation to encourage activities related to chunking (9, 10)
7. Lengthy stop-outs effecting educational or professional currency	Faculty leadership in curriculum and program changes (9, 10, 11, 14, 17)	Present information and examples to demonstrate how chunking works (11, 13, 17)
8. Underutilization of college services	Strong institutional leadership and administrative support (9, 10, 11, 17, 18, 19)	Likelihood of employment within one to three terms should drive program selection (1, 2, 5)
9. Staffing shortages and workload concerns	Curriculum focused on skills and outcomes (5, 6)	A single design for chunked programs is not feasible (11)
10. Concerns about increasing costs	Curriculum and scheduling flexibility (11)	
11. Lengthy and complex curriculum design and approval process		

Figure 11: Summary of Findings in Response to Research Questions

## Summary of Findings in Response to Research Questions

Research Question #1: Issues identified	Research Question #2: Strategies implemented	Research Question #3: Guidelines suggested
12. Advisors unfamiliar with chunked programs and/or occupational information	Securing external funding supported development of chunks and pathways (10)	Carefully plan course sequencing (11)
13. Lack of marketing materials to describe the chunks	Tracking and evaluation provided feedback leading to program improvement (16)	Consider alternative scheduling and delivery (2)
14. Academic systems not supporting chunked programs.	Strong involvement of employers and advisory committees (16, 21)	Increase knowledge among college faculty and staff of specific occupations and the labor market in general (6, 12)
15. Lack of systems to connect with students after the first chunk		Build substantive industry partnerships with key decision-makers (16, 20, 21)
16. Not using or not securing feedback from employers and students.		Market chunked programs as a benefit to business (13, 21)
17. Negative assumptions about pathways and chunking.		
18. Financial aid regulations.		
19. State funding policies.		
20. Labor market and economic factors.		
21. Challenges and conflicts in working with employers and other external partners.		

Figure 11: Summary of Findings in Response to Research Questions (Continued)

Note: In Research Question #1 participants identified the issues that arose around chunking pathways. These issues are numbered above left, for the purpose of correlating them with the strategies incorporated by colleges studied (Research Question #2) to design and implement chunked pathways, and the strategies suggested by participants after having experienced chunking at their colleges (Research Question #3). The parenthetical number correlates to the number of the respective issue.

## CHAPTER V – SUMMARY, DISCUSSION, AND IMPLICATIONS

In my study, I explored the relatively recent practice of chunking curriculum to create pathways to promote degree completion. The purpose of the study was to provide guidance to other community colleges considering this practice. This chapter summarizes the findings of my study, provides a discussion of the findings in relation to the related literature, offers recommendations for practice and further research, and includes some final thoughts related to my study of chunking in community colleges.

Chunking was described as one component of a career pathway system which is intended to increase the rate of degree completion among community college students, and lead them to an increase in earned income (Jenkins, 2003). Nationally, the completion of an Associate degree can increase a graduate's earnings by up to 30% for men and nearly 50% for women, over those with a high school diploma alone (Grubb, 1996b). However, Liebowitz and Combes Taylor (2004) report that half of all those who enter a community college do not complete their first year, and nearly 70% of professional-technical students finish less than one year of college credits over five years.

Several researchers found that one critical component of developing pathways to degree completion was a system which bundled connected coursework and provided a clear roadmap for using those bundles to complete an Associate's degree non-sequentially (Jenkins, 2003; Poppe et al., 2004; Workforce Strategy Center, 2002). This bundling of coursework into chunks is a framework upon which career pathways can be constructed. Chunking, as part of a comprehensive career pathways system, is a relatively new phenomenon, but more and more colleges are considering

its implementation, particularly as organizations such as the Charles Stewart Mott Foundation and the Ford Foundation have begun funding projects to study the impact of pathways in helping low-skilled adults earn college credentials (Community College Leadership Program, n.d.; Jobs for the Future, 2005). However, there has been little research conducted into the practice of chunking, making a study of this kind critical to understanding the issues that arise when chunking, as well as the guidelines that may help steer implementation at community colleges.

### Summary and Discussion

The findings of my study are summarized within the framework of the three research questions, outlining the significant themes that emerged for each. The three research questions were: (1) What issues need to be anticipated when chunking professional-technical programs or degrees? (2) How can those issues be resolved? and (3) What guidelines should be used when implementing chunking? The perceptions of the participants, along with printed and electronic publications from the three colleges included in this case study, formed the qualitative data that was reviewed and analyzed to develop the findings. This section also provides a discussion of the findings in relation to the related literature to confirm, disconfirm, and add to the previous research on the topic of chunking to create pathways to degree completion.

#### *Research Question #1: What Issues Need To Be Anticipated When Chunking Professional-Technical Programs or Degrees?*

Participants representing the three colleges included in my study identified many issues that arose before, during, and after the implementation of chunking. However, all administrators, faculty, and staff interviewed were, and continue to be,

proponents of chunking as a way to increase student retention and completion, to improve responsiveness to business and industry, and to aid faculty in the innovative redesign of program curriculum. *“This is a system that believes in challenging the status quo – and that education is not a static concept – it’s constantly evolving and changing and growing, and moving in new directions to meet student and community needs” (Administrator)*. Participants in this study identified issues that arise in three areas when chunking curriculum: student issues, institutional issues, and external issues.

### *Student Issues*

Participants believed that students who come to the community college have many issues that impact their ability to successfully complete courses and credentials. There are not necessarily significant differences between the traditional programs and the chunked programs, in terms of the impact student issues can have on retention and completion. While some participants believed that the compressed, intensive schedule of chunked programs may be more challenging for students struggling to balance multiple life issues, others felt that the shorter duration of chunked programs made it more likely that students can actually finish. In their study of the factors influencing the decision to enroll or continue to be enrolled in a community college by low-wage workers, Gooden and Matus-Grossman (2002) identified short-term training which earned college credit toward a more advanced credential as benefiting individuals with multiple barriers to community college enrollment.

The student issues identified in my study included: appearance of life crises such as financial problems, loss of housing, or medical emergencies; balancing work,

family and student responsibilities; and lack of basic reading, writing, mathematics, and self-management skills. Study participants also recognized that community college students often fear returning to school, and have a sense of not belonging in college. These findings are consistent with Kostick (2001), Eubanks (2001), Genzuck and Baca (1998), and Haselkorn and Fidler (1996) who identified the demands of parenthood and employment, financial constraints, and educational readiness as barriers to college enrollment and completion. Kostick (2001) found that negative beliefs about the ability to succeed in college were also a significant barrier to enrollment in a community college. Gooden and Matus-Grossman (2001) identified life crises similar to those identified by study participants, to explain high dropout and low completion rates in postsecondary education including problems with housing, physical or mental health, and transportation. Factors identified by Gooden and Matus-Grossman which were not mentioned specifically by participants in my study included domestic violence, substance abuse, and discrimination.

Participants believed that students may have unrealistic perceptions about the occupational area they want to study, which may lead to dissatisfaction as the student learns more about the occupation, and if their perceptions do not match reality. While the related literature did not specifically mention the relationship between unrealistic expectations and dissatisfaction, Gonzenbach's (1993) research examined the key factors that influenced the decision of community college students enrolled in an office occupations program to continue their education beyond completion of an Associate degree. She highlighted the importance of employment and labor market information in guiding students to make sound educational and employment choices.

Participants in my study believed that a job is the primary goal for most students in professional-technical programs, not an Associate degree. Thus, the student may not be motivated to return, given the many hurdles they may have to face in college. This was supported by McConnell's (2000) findings that job-related skills tied to specific occupations and finishing a program of study quickly are both important to first-generation community college students. Gooden and Matus-Grossman (2001) found, when interviewing former community college students who had not earned a credential, that they also had prioritized employment over education.

A significant issue for chunked programs, according to one participant, was the problem of students stopping out too long between chunks, thereby losing the currency of their skills and needing to re-take courses. Given the recent development of chunking, the issue of currency following planned stop-outs has not been addressed in the related literature.

The final student issue raised by several participants is students' underutilization of college services, even when those services promoted student success. Many chunked programs had special advising, tutoring, and other help built into the program, but it was still difficult for students to find time to take advantage of these services. This is particularly troubling, in light of the overview of student retention research by Wild and Ebbers (2002) which found a connection between retention and the degree to which students integrate into college. Making use of college services is one indication of the extent to which a student has integrated into college life.



*Institutional Issues*

Institutional issues were the second area of concern to study participants. These issues referred to the internal functioning of the college, and whether college systems supported the practice of chunking. Primary among the institutional issues identified was the sheer volume of work for faculty associated with teaching, curriculum development, student support and advising, employer advisory committees, negotiating college systems, and maintaining professional currency. Several participants believed that the current method of calculating workload, based solely on teaching load, is inadequate. For instance, many of the faculty participants have, in addition to their teaching responsibilities, administrative responsibilities, functioning as program directors or department chairs. Additionally, there is confusion about the role of student support staff in the colleges, and a sense that advisors often did not understand the programs for which they advise. Because of these issues, participants believed that additional faculty and staff should be hired to ameliorate the added work load. Again, there is little mention of workload as an issue in the related literature on pathways and chunking, given its recent development at community colleges. However, the evaluation of California's New Visions Program, a program that included academic preparation and short chunks of credit training leading to employment, identified that staff were overextended due to the unexpected frequency and severity of student needs (Fein, Beecroft, Long, and Robertson, 2003).

Preliminary results from research of seven states that developed career pathways indicate that development of pathways is complex and time-consuming, and requires additional staffing (Jenkins & Strawn, 2005).

An initial reluctance to chunk a program was expressed by some of those interviewed. Participants expressed a belief that some of their colleagues were initially suspicious of chunking to create shorter credentials because they believed the practice would reduce the number of students staying in the program to complete an Associate degree. Some also believed that their colleagues saw chunking as a workforce development initiative, focused only on employment, and not concerned with overall educational progress. Faculty concerns about the impact of chunking on enrollment in, and completion of, Associate degrees is not an issue that has been examined in the research on pathways and chunking.

Participants voiced concerns about program costs, particularly the concern about being able to offer chunked classes when there is mounting pressure to cancel low-enrolled classes. Some of the programs studied have small numbers of students because the chunked structure is relatively new and participants expressed their belief that it takes time for the information to reach prospective students. Some programs, particularly the two manufacturing programs included in my study, have seen enrollments decline due to economic downturns in that industry. Cost and sustainability were issues raised by Kazis and Liebowitz (2003) in their study which examined promising practices for increasing retention and persistence of low-wage working adults in community college certificate and degree programs. While cost and sustainability were identified as important factors, their study did not examine these issues in detail, but identified them for further research.

College systems and services posed initial problems for some programs; other programs still struggle with fitting aspects, such as unique class schedules, into a

system that is rigidly attached to a defined term. One administrator recalled contacting the State Board of Education to convince the registrar's office that it was legal to offer short credentials outside of the traditional academic term, and to allow the completers to participate in graduation. This confirms preliminary findings of research examining seven states developing career pathways which argued that college policies can be a serious problem in designing programs with flexible schedules and modular formats (Jenkins & Strawn, 2005).

Several participants discussed the complexities of course sequencing, and the logistical process of securing approval for curriculum changes, as stumbling blocks to innovative practices like chunking. Some participants indicated that the separation and lack of coordination between the professional-technical programs and the lower-division transfer programs hindered students' ability to access required general education courses needed to complete the Associate degree. The complexity of course sequencing and curriculum approval processes has also not been examined in the literature on pathways and chunking, but Genzuck and Baca (1998), Prentice (2001), and Grubb (2001) identified the importance of the effort to integrate academic and occupational education as a way to improve student retention, and to produce students able to apply what they know and adapt to new situations.

The way information was communicated through college publications, like the catalog and course schedule, hindered the marketing of chunked programs according to participants. It was difficult to find the information presented in a manner that was clear to prospective students, even though individual programs have produced brochures, flyers, and websites. However, programs often did not have the staff

resources to do the type of outreach and recruitment that is necessary to adequately explain pathways and chunked programs. While several researchers have stressed the importance of clear roadmaps to explain pathways and chunked curriculum, little has been written on the specifics of what should be included in college publications to effectively market chunked programs (Jenkins, 2003; Kazis and Liebowitz, 2003; Liebowitz and Combes-Taylor, 2004).

The final institutional issue raised by participants in some programs was the lack of mechanisms to secure and assimilate feedback from students and employers. A similar finding was reached by Swinney (2001) in a research project that studied the effort to create a manufacturing career pathway system. The study found that many manufacturing training programs operated without an understanding of or connection to employers, employees, job seekers, or students (Swinney, 2001).

#### *External Issues*

External issues included entities and policies, outside of the colleges studied, which were seen as influencing the colleges' ability to successfully implement chunking. Policies that limit the ability of students in chunked programs to qualify for financial aid were seen as a significant barrier, especially for underserved student populations. Traditional funding formulas, based on clock hours, deterred colleges from blending modalities, such as classroom plus distance instruction, which were identified as key elements in chunking, particularly for those programs using a condensed or compressed schedule (Gooden & Matus-Grossman, 2001; Kazis & Liebowitz, 2003).

An issue critical to the success of every occupational program is its relationship with business and industry. For chunked programs, however, a collaborative relationship with business was even more critical due to the newness of the chunked credentials and due to the hope that employers would hire students completing them. Economic and labor market changes, reflecting worker supply and demand, could be problematic for chunked programs according to participants; however, participants recognized that this could be problematic for traditional occupational programs as well. The lesson for chunked programs was to take care that they do not too closely align with one employer or to focus on preparing students in a narrow segment of an occupational area. Participants expressed the belief that business was still not convinced that education can listen to their needs and adapt to meet those needs.

Relationships with other important stakeholder groups, such as professional associations and employer advisory committees, were critical to credentialing, faculty development, and program currency. However, concerns about program quality and student preparation were raised when colleges created shortened credentials. Participants reported that relationships with workforce development programs, a source of referrals for many of the chunked programs and a source of funding for students, were difficult because the workforce programs had misperceptions about the occupational area or were seen as capricious in their funding decisions. Finally, participants said that local universities, especially public universities, were not receptive to creating pathways from professional-technical programs to Bachelor degrees.

The connection of community college occupational training and workforce development efforts to key stakeholder groups has been written about extensively in recent years as changing economic conditions have driven the demand for an increasingly skilled workforce, while recognizing the need for advancement of low-skilled, low-wage workers (Rubin, 2004). Mills and Prince (2003) reported on a survey of workforce development professionals in which half the respondents said that the primary workforce development challenge in their community was employers who were not connected to the workforce system. An intriguing idea, coming from the related literature, which may alleviate some of the problems identified in my study in working with stakeholders, was that of workforce intermediaries. While not specifically mentioned by those I interviewed for my study, the Integrated Health Care System at Maricopa Community College and the Center for Manufacturing Excellence at Shoreline Community College were two examples of workforce intermediary organizations, housed at a community college, and made up of a broad constituency including employers, professional organizations, unions, and educational institutions. Workforce intermediaries were defined by Giloth (2003) as an “eclectic group of organizations that has emerged in the last 20 years, more rapidly in the 1990’s, that has achieved remarkable results for both employers and jobseekers/workers” (p. 6). Giloth (2003) explained that workforce intermediaries operated as brokers implementing strategies to meet the needs of job seekers and employers, but also focused on the broader question of the economic vitality of the community. Interestingly, a stakeholder missing from my case study sites, but identified by researchers on workforce intermediaries, was community-based organizations. It was

argued that the inclusion of non-profit community organizations can expand recruitment and outreach efforts to underserved or marginalized populations and provide social services that community colleges and employer organizations are not prepared to offer to those who need them (Ryan, 2004). Finally, because workforce intermediary organizations represented such a broad array of business, education, government, and community organizations, they could more effectively advocate for system change than any single organization or entity (Mills and Heath, 2003).

*Research Question #2: How Can Those Issues Be Resolved?*

Community colleges included in my study have developed a wide array of strategies to address the issues that arise when chunking programs to create pathways.

*Strategies to Resolve Student Issues*

The first five strategies reported by participants helped address the issues that prevented successful program completion by students. These strategies sought to create formal and informal support structures, communicate key information about the program and the occupation, and provide financial support. The specific strategies included: program orientations; cohorts; special advising; specially designed written and electronic materials; and financial assistance for students in chunked programs.

Program orientations were used as an entry point for new students; a way to provide key information about the college, the program, and the resources available to assist students. As a response to the perception that advising services are often fragmented and underutilized by students and that advising is critical to retention, many participants reported that they had a program-dedicated advisor. In some programs, this position was filled by a faculty member; in others, a professional-level

staff position was created for and hired by the program or through the Student Services Division. Participants felt that advising was so critical that many programs had implemented mandatory advising, generally in one of two ways: students were required to meet with an advisor prior to program enrollment or students were required to meet with an instructor prior to individual class registration. Written and electronic materials were used, in addition to orientation and advising, as another way to educate students about the program. The obvious advantage to written materials is that it gives the students something to which they can refer after the orientation or advising session is over. The importance of providing information about educational and employment options, whether it be through an orientation, advising, or written materials, was documented by Gonzenbach (1993) and Truesdell (1996) as a way to facilitate a sense of connection to peers and faculty, and to outline the specific steps to be taken to achieve the student's educational and employment goals.

Cohorts were used in a number of programs studied in my research and were viewed by interview participants as an effective structure for encouraging students to support one another in meeting their educational goals. The relevant literature reviewed on retention and pathways established that cohorts are used frequently and effectively to improve student retention and completion. McConnell (2000) examined the literature on first-generation community college students to identify ways that colleges can help them complete credentials. She suggested that learning communities, which are similar to cohorts, were effective in addressing personal and social issues that impact retention of first-generation college students. Townsend and Ignash (2003) suggested that a cohort model could be effective in increasing completion rates of



students pursuing an Associate degree as part of a community college teacher pathway program.

There was a surprising amount of financial support available outside the traditional Financial Aid system for students in chunked programs, according to participants. Scholarships, as well as tuition reimbursement from area employers, were the primary methods used by participants to support students with financial need. This confirms the findings of several researchers who documented that the provision of financial assistance is critical to improving access and retention, particularly for underserved student populations (Kostick, 2001; Eubanks, 2001; Genzuk and Baca, 1998; Haselkorn and Fideler, 1996). Gooden and Matus-Grossman (2002) suggested that financial aid approaches which include policies allowing new or expanded aid for working adults and nontraditional students should be implemented to improve access, retention, and completion of postsecondary education.

#### *Strategies to Resolve Institutional and External Issues*

The remaining strategies described by participants provided resolution to a blend of the institutional and external issues as summarized in the previous section on Research Question #1. Participants reported a variety of methods to better calculate and compensate faculty for the workload involved in chunked programs. These included: combining a number of low-enrolled classes to equal the equivalent of one course for workload purposes; receiving release from teaching one or more classes for extra duties, such as curriculum development and advising, associated with chunking; and additional financial compensation for extra hours spent on these extra duties. The

strategies used by community colleges in my study to address workload issues have not been examined in any of the relevant literature on pathways and chunking.

Faculty leadership made chunked programs work. Faculty knowledge of how the institutions functioned and involvement in college committees, increased participants' ability to successfully implement the changes needed to chunk programs. Faculty described a sense of excitement, satisfaction, and responsibility as they undertook the redesign of a program. *"What does the student need was the focus – there were no issues of turf. What we chunked-off in our certificates, we thought they were meaningful. We thought they were stepping stones"* (Program Coordinator).

While the connection between a strong institutional commitment to access and retention of low-income students and the success of developing practices like chunking and pathways was suggested by Kazis and Liebowitz (2003), faculty leadership in chunking has not been studied. However, Jenkins and Strawn (2005) have suggested that it is critical to engage faculty in designing educational pathways to credentials and jobs.

Employer advisory boards and committees were identified by participants as key components for ensuring that programs addressed the issues of business and industry today. The role of Phoenix College's advisory board was, participants reported, apparent in all their programs. This was attributed to the commitment and high level of dedication to the field of health care by faculty and advisory board members alike, based on the willingness of decision-makers at the highest level within health care organizations to serve on the advisory board. Mittelsteadt and Lindsey Reeves (2003), reporting on secondary school career academies, found that business

support was a key element in the success of career academies in helping students complete high school and securing occupational training leading to employment. Kazis and Liebowitz (2003) studied curriculum innovations that help low-income students succeed in community colleges and found that partnerships involving employers in campus activities and curriculum were one of the characteristics common to successful programs. In the programs with a longer history of chunking, study participants reported that the advisory committee was the driving force behind program outcomes, based on industry-recognized skills and competencies. Faculty used those outcomes to create curricula that were reviewed by the advisory committee to ensure that the needed skills were included. Swinney (2001) identified curricula development within the context of industry standards and outcomes tied to national recognized credentials as key elements of a career pathway system.

Several methods of packaging curriculum to create a chunked program were reported by participants including: open-entry, open-exit, self-paced courses; compressed and condensed course scheduling; redesigning and repackaging existing courses; and publicizing a chunked course package without altering schedule or design. Poppe, et al. (2004) recommended that longer-term certificates and degrees be compressed into short, intensive ones. Gooden and Matus-Grossman (2002) identified short-term certification programs with flexible scheduling as an effective method to improve educational opportunities for low-income adults. Interestingly, two aspects of pathways that were featured in the earlier literature were missing from participant responses in my study. There was no mention by participants of efforts to infuse academic modules into professional-technical courses, as suggested by Grubb (2001)

and Prentice (2001). Neither did the chunked programs included in my study embed developmental skills into their professional-technical courses as suggested by Kazis and Liebowitz (2003).

Given that additional resources were often needed to support the initial, and perhaps the ongoing, costs of chunked programs, participants were quick to look for outside funding sources. Portland Community College partnered with the local Workforce Investment Board to support their development of pathways by chunking professional-technical programs. Funding was used to hire staff to assist with: student outreach, recruitment, and retention; mapping of programs to create chunks; scheduling logistics; and faculty support. Shoreline Community College and Phoenix College participants described successfully securing state and federal grants to support program development. The issues of cost and sustainability were identified by Kazis and Liebowitz (2003) as ones that should be examined when evaluating programs seeking to improve retention of low-income students. However, the specific strategies used by the community colleges in my study have not been examined in the literature relevant to pathways and chunking.

In addressing the issues of student tracking and evaluation, participants reported using existing institutional methods, such as the regular program review process, to gather information from students and employers and make necessary curricular changes based on this feedback. Shoreline developed a system that identified students who completed the courses required for one of the credentialed chunks and would alert the department to contact the student and inform them that they met the requirements for a state-approved certificate and could participate in

graduation. There is little research on effective strategies for student tracking in chunked programs, given the relatively short time that chunking has been in practice.

The final area important in resolving the issues that arose when chunking, as reported by participants, was strong institutional leadership and administrative support. Participants reported that administrators used incentives to encourage the development of chunks, but also provided support and recognition of the efforts the faculty made when redesigning programs. Again, while institutional leadership was identified as important to the success of programs using strategies like chunking (Kazis & Liebowitz, 2003; Poppe et al., 2004), it has not been examined by researchers writing about pathways and chunking.

*Research Question #3: What Guidelines Should Be Used When Implementing Chunking?*

Participants were asked what advice they would give community colleges considering chunking programs to create pathways. Based on their responses, four overarching themes emerged from which preliminary guidelines were developed to assist community colleges considering chunking: 1) preliminary guidelines to promote participation by faculty and staff in chunking; 2) preliminary guidelines for selection and design of chunked programs; 3) preliminary guidelines to support students in chunked programs; and 4) preliminary guidelines to ensure connections to the labor market.

*Preliminary Guidelines to Promote Participation by Faculty and Staff in Chunking*

The high level of faculty participation at Maricopa's Phoenix College, Portland Community College, and Shoreline Community College was instrumental to the success of creating successful program chunks. Participants suggested that creating

opportunities for connection and relationship-building among colleagues led to a sense of enthusiasm for chunking and cooperation for working together to create program chunks. They reported that it was critical to connect faculty new to chunking with more experienced faculty in order to communicate how chunking benefits students, the program, and the discipline and to share the particulars of how chunking is accomplished. Participation in chunking was also encouraged through increased program resources, as well as actual or threatened decreases in program resources. The preliminary guidelines proposed by participants highlighted the importance of furnishing needed resources to support and recognize the efforts of those who implement chunking, thus building confidence among the trailblazers and encouraging others at the college to take part as well. This was supported by findings of Mazzeo et al. (2003) in their study of five community colleges that developed new methods to serve students lacking academic skills. The study supported the development of pathways and chunking through creating opportunities and finding resources to help faculty learn to teach in new ways (Mazzeo et al., 2003).

#### *Preliminary Guidelines for Selection and Design of Chunked Programs*

The actual development of the chunk or chunks is where the leadership and participation of faculty was so important. According to participants in my study, the likelihood of employment within one to three terms should drive the selection of programs to be chunked because employment in a short period of time is necessary for many community college students. Chunking selection and design should be based on those programs with good employment prospects and those that do not require

numerous prerequisite courses. There is little in the related literature on pathways and chunking that examined the specifics of the selection and design of chunked programs.

Participants agreed that no single design for curriculum chunking fits every professional-technical program. The process must be guided by the unique aspects of the discipline, student needs, and the requirements of the industry. Rubin (2004), writing of the challenge of advancing low-wage, low-skilled workers beyond entry-level jobs, argues that there is no “one size fits all” way to promote career advancement. The three colleges in my study used four different designs in their chunked programs: open-entry, open-exit, and self-paced; compressed, condensed scheduling of classes; packaging of existing courses as a chunk; and redesigning and repackaging curriculum. While curriculum redesign to support pathways has been explored in the related literature (Jenkins, 2003; Kazis and Liebowitz, 2003; Poppe et al., 2004), little research into the effectiveness of the different types of designs of chunked programs was evident.

Colleges should take advantage of existing structures such as subject-area faculty committees, advisory committees, or other groups, rather than create parallel systems to design and implement chunking, according to study participants. They believed that use of existing committee structures avoided duplication of efforts, conferred credibility to the concept of chunking, and increased support for the resulting design. No research has examined the differences between the use of existing college committee structures to implement chunking versus creating new committees to take on that responsibility.

Another preliminary guideline suggested by participants was to carefully plan course sequencing within the context of chunking and pathways, always keeping the goals of degree completion and career advancement in mind. Study participants agreed it was important to recognize the complex interplay between the courses that make up each chunk and the need for faculty to work collaboratively to ensure that students have the necessary skills to move from one course to the next in each chunk. This supported the findings of Jenkins and Strawn (2005), who examined the efforts of seven states to build a career pathway system. They contended that redesigning programs to allow students to move from one level of education and employment to the next and repackaging curricula were among the biggest challenges in developing career pathways. Unlike the colleges included in Jenkins and Strawn's (2005) report, the three community colleges included in my study did not include specific mechanisms to create bridges that allowed students to transition from remedial education to the chunked occupational programs.

The final preliminary guideline for the selection and design of chunked programs suggests that colleges consider alternative scheduling and delivery. Participants suggested that colleges consider strategies such as condensing the program, breaking classes into modules, and initiating block-scheduling of classes to allow students to finish in a shorter period of time. This confirms the findings of Poppe et al. (2004) which recommended that community colleges compress existing long-term occupational programs into short, intensive ones so that students can enroll year-round and complete programs quickly. Mittelsteadt and Lindsey Reeves (2003), in their research on high school career academies, identified scheduling systems that



allowed students to move together in sequence and coordinated block scheduling as common components of successful programs.

It was equally important to use a variety of instructional delivery methods such as classroom and web-based courses, according to participants. From Gooden and Matus-Grossman's (2001) study of the experiences of low-wage workers at six community colleges, distance education options that combined the use of technology with on-campus support was identified as a promising practice to better support low-wage workers in securing college credentials. Participants also agreed that courses and modules within courses should be adaptable to give faculty the ability to create instructional components to quickly meet the needs of students or employers. This might mean a four-credit course could be offered as the full four-credit course or it could be offered as a set of half-credit modules. Several researchers also identified flexible, modularized course formats as an approach that may improve access, retention, and completion of postsecondary education (Gooden and Matus-Grossman, 2002; Jenkins and Strawn, 2005; Kazis and Liebowitz, 2003; Poppe et al., 2004).

#### *Preliminary Guidelines to Support Students in Chunked Programs*

Interview participants suggested four preliminary guidelines to support students in chunked programs. The first guideline encouraged community colleges developing chunked programs to create opportunities for students to build relationships with other students creating a social network that can help reduce a new student's sense of isolation and providing a support system to call on in times of trouble. Jorissen (2003) used career development theory to highlight the importance of building new relationships as a critical activity for students successfully engaged in

career transitions. The use of cohorts, learning communities, or both as an effective way to build relationships and a support system for students has been well established in the relevant literature on student retention and pathways (Clewell and Villegas (2001); McConnell, 2000; Townsend and Ignash, 2003; Wild and Ebbers, 2002).

The next preliminary guideline encouraged colleges to put systems in place to build connections between students and faculty or staff. Participants believed that connections between students and faculty or staff was an effective way to assess student learning, offer advising or instruction tailored to student needs, and increase student confidence. Wild and Ebbers (2002) noted that student retention research underscores the importance of the level of involvement a student has with peers or faculty as impacting retention and persistence. Truesdell (1996) found that supportive faculty can facilitate a sense of connection for students which was critical during transitions such as transferring from community college to university.

Development and dissemination of information about pathways and chunking informed potential students about chunking, but also encouraged students to return to pursue additional chunks and credentials. The programs studied have developed materials such as flyers, brochures, websites, handbooks, and advising sheets to aid students in planning an educational pathway. Study participants suggested that outreach to students informing them about chunks, as well as college course schedules listing all courses for each chunk, were helpful for encouraging students to pursue chunked programs. Jenkins and Strawn (2005) suggested similar strategies from their research on seven states developing career pathway systems. They suggested creating clear “road maps” that provide high quality information outlining educational and

employment options, as well as explaining how the different structures within the community college connect to enable students to better negotiate the college system.

The final guideline to support students was to provide financial aid specifically designed for students in chunked programs. Given the inflexibility of federal financial aid policies that prevented many students in chunked programs from qualifying for aid and the financial need of many community college students, colleges implementing chunking should consider developing scholarships, grants, and loans that are specific to the chunked programs. Employers and professional associations were promising sources of funding for the development of special financial assistance programs. Gooden and Matus-Grossman (2001, 2002) were among the researchers identified financial aid policies as a barrier to student success and suggested modifying policies to make aid available to students in alternative programs such as those with chunked credentials.

#### *Preliminary Guidelines to Ensure Connection to the Labor Market*

Three preliminary guidelines were suggested for ensuring that colleges implementing chunking have adequate connections to the labor market so that the chunks developed effectively prepared students for employment. The first guideline recommended that faculty and staff in chunked programs should acquire specific occupational and general labor market information in order to provide advising to students and instruction that teaches specific skills, as well as an understanding of how those skills may be transferable to other occupational areas. Gonzenbach (1993) contended that student advising using labor market information and employment projections was critical to helping students clearly connect their employment goals to

their reasons for obtaining an education at a community college, a key factor in students' decision to terminate or continue education.

Another preliminary guideline suggested that industry partnerships, particularly with high-level decision-makers, must be substantive to secure needed support from business and to assure prospective employers that students have the skills to perform in the labor market. There is substantial support for the importance of business and industry partnerships in the related literature, particularly in the research on pathways in secondary education. Mittelsteadt and Lindsey Reeves (2003) reported that business support and regular connection with employers were among the key elements contributing to the success of career academies, a model in which academic and occupational education are integrated around a general career theme. Kazis and Liebowitz (2003) corroborated the importance of business partnerships involving employers in campus activities and program curriculum as one of the characteristics of redesigned community college programs using approaches such as chunking. The colleges Kazis and Liebowitz (2003) studied demonstrated outcomes which allowed students to progress quickly from basic skills to credential programs, improved persistence and completion rates, and increased the number of students successfully entering and completing credentialed programs.

The final preliminary guideline suggested to strengthen connections to the labor market was to market chunked programs as an employee-assistance benefit package that could be tailored to the needs of individual businesses. This practice has not been identified or studied in any of the related literature on pathways and chunking.

This section summarized the relevant findings and themes under the rubric of the three research questions: (1) What issues need to be anticipated when chunking professional-technical programs or degrees? (2) How can those issues be resolved? and (3) What guidelines should be used when implementing chunking? The results of participant interviews, along with printed and electronic publications from the three colleges included in this case study formed the qualitative data that was reviewed and analyzed to develop the findings. This section also provided a discussion of the findings in relation to the related literature to confirm, disconfirm, and add to the previous research on the topic of chunking to create pathways to degree completion.

#### Implications for Practice

In this section, I address the policy and practice implications of the study's findings. Table 2 presents a set of guidelines based on my analysis of the research findings and the related literature. The issues, solutions, and guidelines that emerged from the data collection have implications that cannot be neatly organized under the rubric of the research questions. Therefore, they are presented in an order roughly comparable to that presented in the section on the issues that emerged when chunking: student implications, institutional implications, and implications relative to external factors. The colleges that participated in my study have, despite the issues, all implemented chunking of professional-technical programs. There are differences between the colleges in how chunking was developed and implemented, how widespread the practices is throughout the institution, and how the programs were organized and administered. However, given the interest in chunking as a vehicle to create career pathways, the implications of my study may be helpful to college

Table 2

*Fact Sheet of Guidelines for Chunking*

Guideline
1. Determine if program faculty are receptive to the idea of chunking. Create peer learning opportunities through relationship-building between those who have participated in chunking and those new to it.
2. Allocate college resources to encourage activities in support of chunking.
3. Present information and examples to faculty and staff to demonstrate the specifics of chunking, particularly course sequencing and scheduling.
4. Select programs for chunking based on the ability to create chunks that can be completed in one to three terms and that lead to employment.
5. There is no single design for chunking – the design must be tailored to student, program, and employer considerations.
6. Use existing college committee structures such as curriculum committees to design and implement chunking.
7. Carefully plan course sequencing to avoid delays in access to required courses.
8. Incorporate alternative scheduling and delivery of courses.
9. Develop a support network for students by fostering student-to-student, student-to-faculty, and student-to-staff relationships.
10. Develop and disseminate information about pathways and chunking, particularly roadmaps listing employment and educational entry and exit points.
11. Implement financial assistance specifically for students in chunked programs.

Table 2 (continued)

Guideline
12. Increase labor market and occupational knowledge of faculty and staff.
13. Build substantive industry partnerships, particularly with key business decision-makers.
14. Market chunked programs as a benefit to business.
15. Develop methods to evaluate the effectiveness of chunking.
16. Create bridges from remedial education courses into chunked programs.

administrators and faculty, business and government leaders, and others to show how chunking was developed and implemented, how widespread the practice was throughout the institution, and how the programs were organized. Colleges interested in chunking can also benefit from the perspective of those who have blazed a trail to create a new instructional design that holds the promise of better meeting the needs of students, business, and the community.

#### *Implications for Practice – Students*

Student issues are particularly problematic, since study participants recognized that, ultimately, their college can only do so much to help students resolve these issues. Poor basic skills, personal crises, or both can hinder students' ability to move through a chunked program in the preferred sequence or at the preferred speed. Faculty and staff spend many hours, not only advising, but also securing needed resources to help each student meet the demands of school and personal life.

Chunking, in and of itself, does not decrease the student issues that can affect retention. The implication is that the college must do what it can to ameliorate these student issues with strategies such as: program orientations; cohorts to encourage a sense of connection or community; tutoring to assist with skill deficiencies; mandatory advising; collaboration with student services staff to offer counseling; partnerships with groups that provide case management; family activities to secure family support; and financial assistance for tuition and other costs. Colleges must also consider how to effectively create a bridge for students without college-level academic skills so that they may progress from remedial education to chunked occupational programs.

Chunking promises a way to help students complete credentials, secure employment, and perhaps return to school to continue pursuit of a degree. However, after further review of participant interviews and other college materials, it was clear that many of the programs studied were not publicized in such a way as to be easy for students to discover their existence, or to find out about the next chunk, or to learn how the chunks connected to a degree. Students, therefore, required a certain level of systems sophistication to navigate through these chunked programs. This may be difficult for low-skilled, low-income students who have not had successful educational experiences in the past. The implication is that colleges must be prepared to develop clear and concise materials explaining pathways, as well as training faculty and staff to assist students in negotiating chunked programs. In the colleges included in my study, the tools needed to communicate information about the chunks and to keep students engaged between the chunks were not as well-developed as the programs



themselves. Given the numerous responsibilities of study participants and the struggle for additional resources, this was not surprising.

Colleges considering the implementation of chunking to create pathways might consider an interactive internet portal containing: career information, skill and interest inventories, educational pathways with chunks connected to jobs; and class schedules that can be created based on the pathway selected. This tool, including a visual depiction of the pathway, would not only benefit students and advisors, it would also be useful to high school counselors and to employers as well.

Along with development of tools to communicate the chunks, it is important that methods be developed that support outreach to new students and to students who have stopped-out after completing a chunk. Relationships between students and between students and faculty or staff could be supported through campus and online gatherings focused on topics of interest to students such as occupational updates, educational financing, and previews of upcoming courses. Identifying targeted student populations and providing them with information about pathways and chunked curriculum are opportunities to improve access for underserved populations.

#### *Implications for Practice – Institutional*

Participants reported that issues related to staffing, workload, and professional development also emerged during the chunking process. Fitting faculty into new structures, like chunking, may be difficult due to traditional workload calculation and contractual issues. In the past, workload was determined solely by the number of courses or credit hours taught, with an occasional class release for extra duties. In the colleges studied, workload had not yet been systemically examined since the

development of these new models involves more services, partnerships, coordination, and collaboration. The implications of these personnel issues are that faculty and staff will burn out due to overwork and that colleges will have difficulty retaining employees, or that employees will develop negative attitudes that impact work performance and college outcomes. Negative attitudes can also exacerbate dissention among colleagues in different institutional programs or divisions, making collaboration more difficult. When planning for chunked programs, colleges must consider staffing levels, allocation and calculation of workload, and incentives for participants. Not only do these strategies encourage participation in chunking, but encourage broader participation throughout the institution.

Issues that arise from a lack of resources, from fragmentation, or from poor communication or collaboration result in problems for institutions attempting to implement chunking. One result of the lack of resources is that faculty and staff feel torn between the desire to offer classes to meet community needs and the mandate to cancel low-enrolled classes. The implication is that faculty and administrative leaders should incubate programs experimenting with new models like chunking to give them a chance to grow. They must also develop strategies to alleviate the length and complexity of the curriculum design and approval process. Colleges should develop recruitment strategies for working with business and community partners, as well as with college stakeholders, to increase the likelihood that individuals who will most benefit from chunked programs are aware of their existence.

The desire to meet community needs has increased the speed at which colleges respond to industry demands. However, speed can be a double-edged sword – while

compressed and condensed classes may serve student and employer schedules, it is not clear whether this design produces good outcomes and lack of resources can make data collection and assessment difficult to accomplish. The implication is that colleges may be unable to demonstrate the effectiveness of chunking in terms of student retention and completion, as well as in meeting the needs of business for qualified employees. Colleges must integrate student tracking and program assessment into chunked programs using current methods, such as required program reviews, as well as using the college's institutional research department. Employer advisory committees should also be considered as a mechanism to secure essential feedback on the success of chunked programs from the employers' point of view.

Another issue caused by the lack of resources was the negligible tools available to adequately explain and market chunking. The existing situation in the colleges studied was a sometimes confusing array of brochures, flyers, and web-based materials providing information about careers, programs, and classes. Thus, increasing enrollment in chunked programs will remain a struggle, unless colleges develop clear and concise tools to guide students, advisors, employers, and community members who might be drawn to these new models. Colleges must be creative in looking for sources of funding to support chunked programs and the students in them. Business, government, and private foundations are all potential sources interested in new models that create pathways to degrees and increased employment opportunities.

Fragmentation and poor communication will result in a lack of collaboration among organizational units within the community college. The registration office, for instance, may be unaware of how an individual department is scheduling classes in a

chunked format. It would not, therefore, have the information needed to assist students, or other college stakeholders, with information about a particular chunk. The implication is that the process of chunking becomes more laborious for all those involved and everyone has to work that much harder to make the system work. Fragmentation will also impact the ability of students to move seamlessly among non-credit, developmental education, general education, and professional-technical courses. This fragmentation within colleges creates a tendency for faculty and staff to think in terms of discrete programs, instead of institutional direction when developing pathways and chunking. The implication is that faculty and administrative leaders must examine current organizational structures in light of new models like chunking and consider whether a new structure might better encourage innovation, flexibility, and communication across functional areas. It has been my observation that three separate silos exist within most community colleges – instruction, student services, and workforce development. All three are essential to the success of pathways and chunking. A new structure may need to be considered, one that provides for more fluidity between those separate silos, and supports cross-functional teams made up of faculty and staff from instruction, student services, and workforce development. A more powerful team would also include student and employer representatives. Interview participants suggested that the effort to advance the practice of chunking professional-technical degrees may have more credibility with faculty if it lies within academic services, rather than in the student services or workforce development division of community colleges.

Fragmentation may also surface when colleges assess the transferability of credit and non-credit courses that students have completed at other institutions. The implication is that colleges need to develop methods for assessing prior learning by students transferring into chunked programs who have completed coursework elsewhere.

If the initial purpose of chunking is short-term training leading to entry-level employment, the implication is that there is little motivation for the development of subsequent chunks or the sequencing of chunks needed to create the pathway to degree completion. This clearly follows the concern expressed by participants that chunks will detract from a focus on degree completion. Faculty leaders and administrators need to frame chunking in terms of increased enrollment, improved completion rates, student success, upgrading worker skills, life-long learning, meeting community needs, and maintaining the health and vitality of the discipline or profession.

The final implication, based on my study and the related literature, is that community colleges considering chunking must understand its connection to the development of a holistic, comprehensive career pathway system. As proposed by Jenkins (2003), Poppe et al. (2004), and others, the practice of chunking is related to a larger set of features that define a complete career pathway system. As such, it was recommended that chunking should not be done in isolation, but should be part of a well-thought out career pathway system that includes: “bridge programs” to prepare those with low academic skills; support services; job placement services; clearly articulated roadmaps outlining further curriculum chunks; work experience; and college leadership that advocates for these new models.

### *Implications for Practice – External*

External issues raised by participants focused on detrimental federal and state policies, economic and labor market factors, and partnerships with external stakeholders. Federal and state policies can limit the ability of students in chunked programs to receive financial aid and can also limit the reimbursement the college receives based on student full-time equivalency. The implication is that colleges must advocate at the state and federal level to adapt financial aid regulations and funding formulae to better support new models like chunking.

The implications of the economic and labor market factors, as well as partnerships with employers, require colleges to stay on top of labor market trends and to build more effective partnerships with business. However, it is not enough for college administrators to stay informed, faculty must also stay current in their respective professional fields and they must network with professional colleagues and expand their knowledge into new areas as the discipline changes. It is also important that colleges develop connections with many employers, large and small, rather than rely on one huge employer to determine the direction of the professional-technical programs. Finally, community colleges need to assure employers that each chunk prepares students to adequately perform the required skills for a particular job as defined by the employer.

### *Implications for Further Research*

The current study is limited in that it included only qualitative data on the perceptions and experiences of participants from three community colleges which have implemented chunking. It explores a relatively new phenomenon, the chunking

of curriculum in professional-technical programs to create pathways to credentials and employment. Findings of this study may be used to support the experience of other community colleges practitioners and to guide the exploration, development, and implementation of chunking at other colleges. This study revealed that while there are significant barriers to chunking, college administrators, faculty, and staff believe it is a worthwhile endeavor to create short credentials that lead to employment and also lead back to the community college for additional credentials leading to an Associate degree. Innovative curricular and scheduling practices, close relationships with business, and support structures to meet student needs all contributed to the participants' belief in the viability of chunked programs. The dedication and commitment of faculty, staff, and administrators to making these programs work and, in many cases, to persuading college leadership to adapt systems which supported chunked programs was critically important. Further research could move beyond my exploratory study and contribute to a deeper understanding of chunking and, as a result, of career pathways. Additional research should include the areas discussed below.

A study of the outcomes of chunked programs compared to traditional programs would be helpful in determining whether this practice should be expanded. Currently there is anecdotal data from proponents of chunking, but it would be helpful to examine whether chunking does or does not aid in student retention and degree completion and whether there is a resulting increase in wages and career advancement. It would also be useful to examine whether there is any impact on outcomes based on the different methods for scheduling chunked programs. Is a compressed, condensed

schedule more effective than the open-entry, open-exit model, for example? Kazis and Liebowitz (2003) identified that in designing a study to examine programs which employ multiple strategies, it is difficult to determine which strategy is most effective. Future researchers will have to acknowledge the wisdom of Kazis and Liebowitz (2003) advice and recognize that it is difficult to design a study that can account for the impact of all the myriad factors that may impact program success or failure.

An examination of the experience of students in chunked programs might be helpful in understanding which components of these programs were most effective in creating an environment that would most likely retain students and encourage them to return and complete an Associate degree. There is a dearth of research specific to the impact of chunked programs on student retention, persistence, and completion. It might also be helpful to examine whether the experience of students is different depending on income, employment status, and academic preparation, as any of these factors might impact the mix of services that support students in chunked programs. Kazis and Liebowitz (2003) suggested that variables such as age, work status, gender, and skill level of students should also be examined in future research.

The experience of employers working with colleges on chunking is important to better understand the role of employers and their perception of the effectiveness of chunking. It would be helpful to understand how employers were recruited to participate in the chunking process, what the benefits have been, and suggestions they might have for improving the process. It would also be helpful to understand how employers participated in the development of program outcomes, curriculum chunks, scheduling formats, and recruitment strategies. If a primary goal of pathways is that



each chunk leads to a job, the experience of employers with these programs is critical to success. Goldberger, Lessell and Biswas (2005) suggested that a thorough assessment of employer needs and practices is necessary to design programs and policies that make it possible for low-income, low-skilled workers to move up the career ladder. Jenkins and Strawn (2005) found that partnerships among employers, labor groups, and workforce or economic development organizations to identify jobs of importance to the local economy were the first step in the career pathway process.

Given the significant role of faculty in the success of chunking, further research to understand the experience of faculty, in a new initiative like chunking, should be undertaken. The faculty in my study assumed a leadership role and showed a commitment to their profession and an ethic of service to the community. An examination of the personal and professional factors that are common to faculty involved in chunked programs would be helpful. It would also be useful to know if there are differences among faculty in different disciplines in their willingness to participate and develop chunked programs. At a broader level, it would be useful to understand what factors create a sense of professional responsibility and an ethic of service. Given the large number of part-time faculty working at community colleges, it is important for that group to be included in any study.

The participants in my study explained how their respective colleges demonstrated that administrative support, faculty leadership, and inclusive participation, create a dynamic environment that is more than the sum of its parts. The environments they described encouraged creativity, ownership, responsibility, service, and a sense of excitement and fun. An examination of factors and structures that

support an environment of innovation within community colleges would be helpful, at the broad level, to guide colleges in determining the structures and actions needed for college leadership to best support pioneering practices - like chunking. Kazis and Liebowitz (2003) suggested that institutional commitment, internal collaboration among stakeholders, resources devoted to professional development, and governance must be examined in future research since each can have an impact on the quality of programs and the ease with which students navigate a pathways system.

### Final Thoughts

*“We see a need. We join with others. We find the necessary information or resources. We respond creatively, quickly. We create a solution that works.” (Wheatley & Kellner-Rogers, 1996, p. 37)*

I undertook this exploration of the practice of chunking because I was curious about the relatively new phenomenon, wanted to explore its development, and because I believe that community colleges must find better ways to help students, particularly low-income students complete postsecondary credentials and advance in their careers. A study of this nature, examining curricular and program redesign, touched on almost every aspect of the community college – students, personnel, administrative policies and practices, and relationships with the community.

The quotation above illustrates one of the major insights I had during my research – the power of what can be accomplished when dedicated people work together. The level of enthusiasm, commitment, and the passion of faculty who are creating new ways to serve students, their profession, and their community was remarkable. I was struck by the critical role of faculty in the implementation of chunking and pathways at all levels, from curriculum development to partnerships

with business and professional associations. Faculty is the critical linchpin in the design and implementation of chunking and community colleges must find ways to actively involve faculty at the outset of discussions on chunking and pathways. The success of colleges implementing chunking to create pathways hinges on a sense of ownership over the process among faculty – and the belief that they have influence in the outcome of the process.

With regard to curriculum development, the complexity of course sequencing and scheduling was startling. Rather than include programs or subject areas outside the specific area being chunked, the planning for course sequencing and scheduling was generally undertaken program-by-program. However, this meant that each individual student, preferably with the help of an advisor, needed to figure out how to fit in the general education courses required for an Associate degree, for example. This also meant that the programs with these chunked credentials were not well-known or understood throughout the college, according to study participants.

Before my research, I had not considered where pathways and chunking “sat” in the organizational structure of community colleges in terms of importance. Not surprisingly, I found that chunking and pathways had more credibility with faculty when it was clearly seated in the instructional area of the college, rather than in the workforce development or student services areas.

I had made the assumption that institutions intent on implementing chunking throughout the college would set-up a new committee or two responsible for its design and implementation. However, it was gratifying to be told that it is duplicative to create separate committees to implement pathways and chunking at community

colleges and that time would be better spent fitting chunking into the responsibilities of existing committees at the college and thereby perhaps expanding the thinking of these committees.

While there was certainly an understanding among my study's participants of the importance of pathways from remedial education to professional-technical education, few programs had developed specific strategies for bridging from remedial education into professional-technical degree programs. I expected that the programs I studied would have embedded basic academic skills into their occupational coursework as suggested by Grubb (2001) and Prentice (2001). However, this was not the case. The approach used in most of the programs was to offer tutoring assistance outside of regular coursework.

The approach of Portland Community College, Shoreline Community College, and Phoenix College to chunking pathways was surprisingly varied. PCC had a variety of professional-technical programs that have developed the first chunk in the pathway to a degree, but they had not designed the complete roadmap of courses and chunks that lead to an Associate degree. They had also developed a comprehensive set of student support structures, funded through workforce development grants, which include advising, tutoring, and job placement assistance, that could serve as a model for colleges wanting wrap-around student services for those in chunked pathway programs. SCC developed an effective method to track and communicate with students completing short, credentialed chunks which could serve as model for developing components of administrative systems which support chunking. In

addition, PC's enthusiastic and dedicated faculty could serve as model of faculty involvement in all aspects of the chunking pathways process.

The efforts made by the three colleges in my study to develop chunks to create pathways to credentials and career advancement exemplifies how community colleges adapt in focusing on their mission of access, equity, and service to their communities.

*Visions are only the seedlings of reality. We must value and cherish our dreams and visions, nurturing them into fulfillment. Most of all, we must remember that few of our visions can be accomplished alone. The key to the achievements that we strive for is the ability to share our visions and thus earn the acceptance and assistance necessary for turning them into reality. What is truly important, what is lasting, is accomplished together. Be bold, be creative, be dynamic, and be willing to take risks to ensure the best possible education through the uniqueness of the community college. (Roueche, Baker, & Rose, 1989, p. 289)*

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Appendix A  
Career Pathways\*  
Curriculum Chunking Information Sheet

**Career Pathway:**

A career pathway is a series of connected educational programs, with integrated work experience that enables students to combine work and school and advance over time to better jobs and higher levels of education and training. Pathways combine a system of connected courses, student services, and information tools to create “stepping stones” that enables students at all levels of educational preparedness to achieve their educational and career goals.

**Important Curricular Features of Pathways:**

- ❖ “chunked” curriculum – certificate, degree, and non-credit (CEU) coursework grouped into smaller sets of courses, offered at times and places convenient to working adults, each leading to a recognized credential, to enable students to enter and exit education as their circumstances permit.
- ❖ “roadmaps” showing the connections between the “chunks,” as well as between education and training programs and jobs in a given career area at different levels.
- ❖ credentials such as “Employment Skills Training” (EST) certificates that provide employers with information about an individual’s skills in regards to a specific occupation.
- ❖ “bridge” programs that prepare academically unprepared students to enter credit-based academic courses, often by teaching developmental or basic skills in the context of occupational skills.
- ❖ Easy articulation of credits across educational institutions, and clear connections among remedial, academic, and occupational programs within institutions, to enable students to seamlessly progress from one level to the next.

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\* Adapted from Davis Jenkins (2003). *Career Pathway Primer and Planning Guide*. University of Illinois-Chicago.

## Appendix B

### Interview Protocol

1. Describe the program that you have “chunked” to create a pathway.
2. How many chunks does the program contain? How many credits make up each chunk?
3. Does the chunk contain courses outside of the program area?
4. Is there some sort of credential awarded for completing each chunk?
5. What were the reasons that chunking was looked at initially?
6. Was there a problem that was identified that you thought chunking could solve?
7. Describe the process you went through to create the chunk or chunks.
8. Who was involved (internal or external individuals/groups/committees)?
9. What was your role in the chunking process?
10. Describe the role of others involved in the chunking process.
11. What issues did you run into? What were the major challenges you faced in chunking?
12. Describe how, and at what point in the process, the issue arose. Who was involved?
13. What options were considered for each issue/problem?
14. How were the options identified, and what were the advantages and disadvantages of each option?
15. What advice would you give to other college administrators/faculty who are contemplating the creation of a chunked degree or program?
16. What strategies or practices that you employed were most successful when chunking?
17. Based on your experience, what guidelines should direct the process of chunking?
18. Would you like to share any other information based on your experience?
19. Could you identify other faculty and/or staff who have been involved in the chunking process who you think would be useful to interview?

