EXPLORING EMBEDDED REMEDIATION FOR COMMUNITY

COLLEGE CAREER TECHNICAL EDUCATION PATHWAYS:

PROMISING PRACTICES

by

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Abstract

Public community colleges enroll nearly half of all undergraduate students in the United States and many of these students are enrolled in 1- and 2-year Career and Technical Education programs. Employers have indicated that colleges should place more emphasis on reading, writing, and critical thinking skills. Career Technical Education can address the gap between employer expectations and students' skills through classroom redesign.

In 2011, a consortium of California community colleges received a Trade Adjustment Assistance Community College and Career Training Grant from the U. S. Department of Labor to address postsecondary educational needs and improve student outcomes in an economically distressed area. The consortium adopted eight guiding principles to inform their work within designated Career Technical Education pathways. The purpose of this research study was to explore the implementation of one of the eight guiding principles—embedded remediation.

The study used a qualitative, multi-case study method to discover promising implementation practices, and was guided by five research questions: How can embedded remediation at each case study community college be characterized and how did the implementation evolve? How are faculty trained to embed remediation? How do faculty members perceive that the implementation of

embedded remediation has affected student learning, completion and preparation for employment? What recommendations do faculty members have for embedding remediation in CTE programs? How do students perceive embedded remediation in relation to their learning? Data were collected using semi-structured interviews, focus groups, observations, and documents. Faculty, tutors, and students at the three case study colleges participated in the study. A content analysis was used to identify themes and triangulate data from different sources. Finally, a cross-case comparison was conducted.

Several themes emerged from the study including the importance of on-going communication among faculty, with the institution and with students; the use of trained tutors to provide supplemental learning both within and outside of the classroom setting; professional development for faculty to assist in the paradigm shift of classroom redesign; and collaborative learning for faculty and students. Based on the findings, promising practices were developed for implementing redesigned vocational pathways that support student success.

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CHAPTER 1: INTRODUCTION

Background of the Study

Public community colleges enroll nearly 45% of all undergraduate students in the United States (American Association of Community Colleges [AACC], 2012). Career Technical Education (CTE), sometimes referred to as vocational education, has been a primary focus of community colleges since their inception. In California alone approximately one-third of enrollments are in courses labeled vocational (Shulock, Moore, & Offenstein, 2011). Recently, President Obama called for America's community colleges to increase the number of degrees produced by an additional 5 million by the year 2020 (White House, Office of the Press Secretary, 2009). Community colleges will need to examine current practices in order to meet this goal considering that less than half of those students who enroll in a community college achieve their stated educational objective within 6 years (AACC, 2012).

Contributing to the problem of low completion rates in community colleges, and CTE in particular, is a perceived lack of the basic skills required for students to be college ready. Bailey, Jeong, and Cho (2009) found that 59% of first time entering community college students required remediation in one or more areas (reading, writing or math) based on college placement exams. Moreover, in a study by Hart Research Associates (2013), a majority of the 318 employers surveyed indicated colleges and universities should place more emphasis on reading, writing and critical thinking skills.

The spotlight currently focused on community colleges, particularly in the area of workforce preparation, creates an environment that requires community colleges to adapt to meet the needs of a diverse student population.

Zumeta, Breneman, Callan, and Finney (2012) report that the population of whites in the workforce with bachelor's degrees or higher is shrinking while work force minority groups with only a high school diploma or some college are increasing. They also report that trends indicate this shift will provide a workforce in the year 2020 that is less educated than the workforce of 2000. In a knowledge-based economy, the United States can ill afford to ignore this trend.

Community colleges are under pressure to develop innovative ways to meet the needs of their diverse student population and find effective strategies to assist students in completing their educational goals. Traditionally, many students with low academic skills enroll in career technical or vocational programs. Usually these programs do not require remediation in reading, writing or numeracy skills in order to progress through the certificate program (Rosenbaum, Deil-Amen & Person, 2006). However, the competency level required for these skills in 21st century jobs is significant (Carnevale, & Rose, 2011; Zumeta et al., 2012). For students who may require three to four semesters of remediation in reading, writing or math, the pathway to improved job prospects through a traditional degree program is nearly impossible (Bailey et al., 2009; Perry, Bahr, Rosin, & Woodward, 2010; Strong American Schools, 2008). Moreover, the employers of today require increased competency in these areas (AACC 2012; Zumeta et al., 2012). The answer may lie in changes that faculty make within their individual classrooms and programs of study. A learner centered classroom that provides for a joint partnership between student and instructor with remediation firmly embedded in the culture of the classroom could provide a framework for increased student success (Barr & Tagg, 1995; Merriam, Caffarella, & Baumgartner, 2007; Rosenbaum et al., 2012; Weimer, 2002).

Purpose of the Study

In 2011, to improve student outcomes and address an economically distressed area where unemployment hovers around 19%, a consortium of California community colleges applied for and received a Trade Adjustment Assistance Community College and Career Training Grant (TAACCCT) from the U. S. Department of Labor (DOL). The Consortium adopted a Single Structure Strategy (Appendix A) to redesign designated CTE pathways in order to improve employability rates. One of those redesign elements was focused on embedded remediation.

The purpose of the research study was to explore the implementation of embedded remediation in designated CTE pathways at selected California community colleges in an effort to identify promising practices. The study was guided by five research questions:

1. How can embedded remediation at each case study community college be characterized and how did the implementation evolve?
2. How are faculty trained to embed remediation?
3. How do faculty members perceive that the implementation of embedded remediation has affected student learning, completion and preparation for employment?
4. What recommendations do faculty members have for embedding remediation in CTE programs?
5. How do students perceive embedded remediation in relation to their learning?

Significance of the Study

This study aimed to provide promising practices that can be used by community colleges to redesign CTE programs with embedded math, reading,

writing, and study skills. The work is of national importance as community colleges seek to meet the need for a more educated work force. The development of promising practices will provide community colleges with a starting point from which to build and shape embedded remediation that meets the needs of their own students and communities. Moreover, a recent report by the U.S. Government Accountability Office (2013) highlighted the lack of empirical research regarding strategies for retooling developmental coursework to improve student outcomes.

Theoretical Framework

The study was framed by three theories that focus on the partnership between student and teacher: (a) Constructivist theory of learning, (b) Learning Centered theory, and (c) Dweck's theory of Mindset. Constructivist theory of learning, which states that the learner is progressively building knowledge and must be actively involved in the process, provides the base on which Learning Centered theory stands (Dewey, 1963; Rogers, 1983; Weimer, 2002). Learning Centered theory puts the focus of the classroom on the learner and the process of learning rather than the teacher and the delivery of knowledge (Barr & Tagg, 1995; Rogers, 1983). Mindset provides the foundation for understanding the role as well as the needs of the learner within the classroom environment (Dweck, 2010).

Definition of Terms

Basic Skills. A lack of preparation in the level of math, reading or writing that is required to succeed in college, and is used interchangeably with the term developmental education, remedial education and remediation (Boroch et al., 2007).

Career Technical Education. Vocational course work at community colleges and technical schools (Shulock et al., 2011).

Cohort Model. A group of students who enter a program of studies together and complete a series of common learning experiences over a period of time (Saltiel & Russo, 2001).

Flipped Classroom. A classroom where students gain their first exposure to new material outside of class and then use class time to understand the new material through problem-solving, discussion or teaching their peers (Brame, 2014).

Learning Centered Classroom. A classroom where the focus of attention is on learning. This includes a focus on what and how students are learning as well as well as the retention and application of learning (Weimer, 2005).

Persistence. A student who enrolls in the college from term to term or enrolls in the next course in a sequence of courses (Seidman, 2005).

Retention. Indicates that a student has stayed in the course for the duration of the term or through graduation (Seidman, 2005).

Successful Completion. A student completes a course with a letter grade of "C" or better or receives a Pass in a pass/no pass class. (Seidman, 2005).

Trade Adjustment Assistance Community College and Career Training Grant (TAACCCT). The Department of Labor (DOL) defines this grant as "providing eligible institutions of higher education with funds to expand and improve their ability to deliver education and career training programs that can be completed in 2 years or less, and are suited for workers who are eligible for training under the Trade Adjustment Assistance (TAA) for Workers Program" (U.S. Department of Labor Employment and Training Administration, n.d.).

Organization of the Study

Chapter 1 presented an overview of the study which included (a) the background, purpose, research questions and significance, (b) theoretical frameworks utilized, and (c) definitions of terms. Chapter 2 analyzes literature concerning remedial education, career and technical education, and related research. Chapter 3 describes the methodology and data analysis procedures used to study embedded remediation at the case institutions. Chapter 4 presents the findings for each case study institution along with a cross-case analysis identifying commonalities and differences in the implementation of embedded remediation at the three colleges. Chapter 5 discusses the findings, implications, and recommendations resulting from the study.

CHAPTER 2: REVIEW OF THE LITERATURE

Basic Skills

Chapter 2 provides a review of the literature that (a) describes the current practices in basic skills in community colleges, (b) highlights students lack of success in navigating current practices within institutions, (c) gives a background and historical basis for CTE instruction, (d) defines the theoretical framework, and (e) gives an overview of embedded remediation in vocational programs of study.

Identifying the Issues

Community colleges have provided a pathway to education and living wage jobs for over 100 years (Gordon, 1999). Their open access policies have made college education a reality for traditionally under-represented populations and yet, open access has not translated into completion of degrees and certificates especially among minority students (Bailey et al., 2009; Boylan, Bonham & Tafari, 2005; Fowler & Boylan, 2010; Shulock & Moore, 2007). Often community colleges focus on the perceived deficits of the student rather than looking at the institutional processes, policies and procedures that are barriers to students' successful completion (Bailey et al., 2009; Boylan et al., 2005; Fowler & Boylan, 2010, Shulock & Moore, 2007).

However, Conley (2010) asserted that colleges adopt an either/or (remedial or college ready) mentality that is inadequate at best in assessing students' ability to achieve in college and therefore limits the college's student services faculty's ability to assist students. Conley suggested a new definition of college readiness that reflects a continuum of preparedness for college. This continuum looks at a student's strengths and weaknesses across four domains—knowledge, skills, attitudes and behaviors—that are necessary for success in college. Conley's view

was similar to the view held by Boroch et al. (2007) in identifying the need for basic skills education as developmental education rather than remedial education. Boroch et al. stated, "the current educational process is transformational, taking the student from one state and developing his or her abilities into those of a more capable, self-confident, and resourceful learner" (p. 9). Boroch et al.'s use of the term college ready also included a reference to skills and attitudes, "study skills and learning skills which are necessary for students to succeed in college-level work" (p. 13). Boylan, Bonham, and White (1999) also described developmental education as a continuum of services that range from discrete basic remedial courses to those services providing tutorial and other student support services that assist students in the affective domain.

Conley (2010) also argued that remediation, in its current form, is not working and that a different approach is necessary. He is not alone in his analysis. Radford, Berkner, Wheeless, and Shepherd (2010) analyzed the National Center for Education Statistics and found that nationwide only 41-57% of students who take any combination of remedial courses go on to earn a college degree compared to 69% of non-remediated students. For those who take one or two remedial math classes only 27% complete a degree. These data were supported in research conducted by Bailey et al. in 2009.

Current Iterations

Bailey et al. (2009) examined the referral, enrollment and completion of community college students in the developmental education sequence at 57 community colleges that participated in the first 3-year funding cycle of an Achieving the Dream initiative; a sequence means that a student needed one or more remedial courses before taking the required college course for math, reading, writing or ESL. These colleges were chosen because they had 3 years of data

available to track student progress. The sample consisted of 256,672 first time students who enrolled in either the fall or spring semester of the designated colleges in 2003-2004 academic year and focused on the two primary remediation sequences, reading and math. The students were followed through 3 academic years of enrollment in remedial courses.

According to Bailey et al. (2009), 46% of students referred to the reading developmental sequence and 33% of those referred to the developmental math sequence completed the required sequence including the required college level courses for a degree or transfer. These percentages included students who needed three or more levels of remediation as well as students who only had one level of remediation to complete. However, when the data was disaggregated for students who had three levels of remediation courses, the successful sequence completion rates were 17% for math and 29% for reading. Unfortunately, for students who begin their college career at this level, there are extremely low successful completion rates in the remedial courses as well as low persistence to the completion of a degree or transfer. The more levels of developmental education a student must go through, the less likely that student is to ever complete college English or math (Bailey, 2009; Perry et al., 2010).

Bailey et al. (2009) also found that a significant number of students who did not complete the developmental sequence had either (a) never enrolled in the first course of the remedial sequence or (b) successfully completed the first course of the sequence but did not persist to enroll in the second course of the sequence. Bailey et al. referred to these opportunities for students to leave the sequence as exit points. Hern and Snell (2010) have done extensive work in California's community colleges regarding exit points for students. They hypothesize that the more exit points, or opportunities, for a student to exit the remedial sequence or

the college altogether, the less likely a student is to complete that sequence or persist to a college degree, certificate or to transfer.

Hern (2011), a professor of English at Chabot College, and her colleagues began to study this trend over 15 years ago. They found similar results for students on their campus and eventually revised their curriculum to provide a one-semester accelerated remediation course prior to taking transfer English that has no minimum placement score. Over the 15-year period, instructors at Chabot College had seen an increase of more than 30% in the total number of students persisting and successfully completing transfer English after taking the accelerated one-semester course compared to students who took the two-semester sequence (Hern, 2011). The success rate proved to be true even for students who scored at the bottom in the lowest level of the scale on Chabot's assessment test (Hern, 2011). Successful completion rates for basic skills students who chose to take the traditional two-semester remedial sequence had remained the same for the last 10 years, around 28-34%. This finding is significant in the current environment of increased transparency and accountability for higher education.

The idea that institutions of higher education should be held accountable for the learning outcomes of their students can be traced to the 1980s but has gained significant traction in recent years (Zumeta et al., 2012). The National Center for Public Policy and Higher Education issued a series of reports on the performance of higher education in the nation from 2000-2008. The Center examined six categories of performance for higher education in all 50 states and gave each state a ranking of A, B, C, D, or F for each category. The 2008 report, "Measuring Up," gave a grade of incomplete to all 50 states regarding the category of student learning, indicating that there was insufficient data to do a comparison. The National Center for Public Policy and Higher Education (2008) report

recommended that states make a commitment to understanding more about the "educational capital" of their citizens, which is defined as "the level of collective skills and knowledge possessed by state residents" (p. 23).

More recently, accountability measures have emerged at the state and national levels in the form of publicly displayed online scoreboards. The California Community Colleges Chancellor's Office (CCCCO) has created a Student Success Scorecard to provide greater transparency to the public for the performance outcomes of each college. This scorecard provides the colleges and public with information on the rates of completion as well as the attainment of milestones that lead to completion such as accumulating 30 units, persistence to the next semester or course and completion of basic skills courses (CCCCO, 2013). Moreover, in 2013, President Barack Obama proposed increased accountability for higher education including the creation of a scorecard and tying financial aid to completion rates (White House, Office of the Press Secretary, 2013).

Along with increased demands for accountability, President Obama has asked America's community colleges to educate more students, increase certificates in 21st Century jobs, associates degrees and transfers to universities in order to assist America in regaining its lead in college attainment output (White House, Office of the Press Secretary, 2009). These pressures for increased productivity during economic downturns may cause some institutions of higher education to reduce the number and scope of basic skills courses, as students' poor performance will have a negative impact on the institutions performance scorecard (Zumeta et al., 2012). Moreover, when institutions reduce or dismantle some forms of remedial education, the greatest impact will be on students in the lowest levels of socio-economic status including students of color (Symonds, Schwartz & Ferguson, 2011; Zumeta et al., 2012).

Costs to Students and Society

For many years questions have been debated regarding the efficacy of remedial education. One of the driving questions in the debate over remedial education is the financial burden to the student, the institution and to society in general. Some argue that providing remedial education in post-secondary education is too costly and not particularly effective (Alliance for Excellent Education, 2011; Complete College America, 2011; Perry et al., 2010; Strong American Schools, 2008).

Others argue that the cost of not providing those remedial education services eventually encumbers taxpayers even more in terms of supporting those who fall into poverty or become imprisoned (Saxon & Boylan, 2001; Symonds et al., 2011). For example, the largest group most likely to be unemployed at any time is comprised of those without a high school diploma and those least likely to be unemployed are those with bachelor's degrees and higher levels of education (Symonds et al., 2011). Baum, Ma, and Payea (2013) conducted a study analyzing employment and education trends over the last few years. They found that during the years 2010-2012 the unemployment rate for individuals age 25 and over declined for all education levels including those without a high school diploma. Although, unemployment remained at double digits, 12.4%, for those lacking a high school diploma, this rate was a significant drop from 14.9%. Those individuals with an associate degree had a smaller drop in unemployment rates going from 7% to 6.2% and those with a bachelor degree saw an even smaller dip in unemployment rates dropping from 4.7% to 4.0%. However, as Baum et al. pointed out, those without a high school diploma continue to experience significantly higher unemployment rates compared to those with post-secondary education even when the economy is improving.

While employers continue to demand broader academic skills in order to remain competitive in the workplace, the implications for the growing numbers of adults without those skills are dire (Carnevale & Rose, 2011; Symonds et al., 2011). As stated by Davis Jenkins (2003), "Research shows that it is very difficult to work one's way out of poverty—having a job by itself does not lead to career advancement for most former welfare recipients and other low-wage workers" (p. 4).

A study by Kirsch, Braun, Yamamoto, and Sum (2007) identified the widening chasm between the literacy and numeracy skills needed to compete in both the global and national economy and the numbers of students who have mastered these skills, with minority students showing weaker performance than white students. The high school graduation rate for minority youth in 2006 was approximately 50% as opposed to a 70% graduation rate for white students (Kirsch et al., p. 3). Not surprisingly, this same disparity in high school graduation rates was carried over into the community college where, in 2006, only 22% of all students who started the path to degree or transfer finished their stated goal within 3 years; 17% of Latinos and 14% of African Americans completed their stated goal. This disparity is particularly troubling when one looks at the expected lifetime earnings of college graduates. In their 2013 "Education Pays 2010: Benefits of Higher Education for Individuals and Society 2012," the College Board and Advocacy Center reported a 73% gap between the annual earnings of those with a high school diploma and those with a bachelor's degree (Baum et al., 2013).

There are those who argue that remedial education is cost effective (Saxon & Boylan, 2001; Shulock & Moore, 2007) as it assists more students to become college educated and provides a more educated workforce that ultimately

contributes to the economy through higher taxes from higher wages. In their article, "The Cost of Remedial Education in Higher Education," Saxon and Boylan argued that the limited available research shows there is a relatively small expense associated with providing remedial education in the post-secondary system. They evaluated five studies that offered statewide and national estimates of these costs and found that generally the cost of remedial education is less per full time equivalent student than other course offerings on college campuses. Saxon and Boylan noted that remediation costs are consistently in the single digits, comprising less than 10% of higher education budgets nationwide.

However other studies, such as one conducted by Vicki Murray (2008), have indicated that the costs of offering remedial education are far greater than the public has been led to believe. Murray's study aimed to estimate the direct and indirect costs of an inadequate education for schools, students, families and society. This study focused on California specifically and found a direct cost of $274 million to California post-secondary public institutions (2- and 4-year) annually for students that were not college ready. Murray argued that, since the primary function of the K-12 system is to prepare students for college, the need for remedial education in post-secondary institutions should not be necessary. Additionally, students who take remedial courses are much more likely to drop out than those who do not need these classes. The Diploma to Nowhere Delta Project found that of the students in the high school class of 1992 who took three or more remedial courses in college, only 19% had received a bachelor's degree by the year 2000 (Strong American Schools, 2008).

Regarding cost to students, Melguizo, Hagedorn, and Cypers (2008) reported that even though community colleges in California have the lowest rate of tuition and fees in the nation, the real cost for students is the amount of time spent

taking remedial courses that do not count towards graduation or transfer to a 4-year university. The longer a student needs to get through the basic skills sequence the less likely that student will have the financial aid necessary to complete a bachelor's degree as new guidelines for financial aid limit the number of semesters that a student can receive Pell grants (U.S. Department of Education, 2013). The Murray (2008) study also factored in an estimated cost of $1.1 to $5.5 million in lost earnings for students who do not complete their college degree.

Jenkins (2003) argued that providing necessary services to assist students needing remedial education is costly, but so is not serving them well. These additional costs include high dropout rates, public perceptions of community colleges as revolving door institutions, as well as costs related to higher poverty rates and lost revenue for states. Murray (2008) would likely have agreed regarding these costs; she estimated additional costs in California alone to include $245 million to $1.27 billion in reduced annual federal spending, $194 million to $1.05 billion in reduced state and local tax receipts, and $1.9 to $5.4 billion in increased health care, crime, and social welfare costs.

A third argument suggested by a number of faculty and researchers (Bailey, 2009; Hern & Snell, 2010; Rosenbaum et al., 2006; Shulock & Moore, 2007) asserts that remedial education is both necessary and helpful, but in need of drastic changes. A disproportionate percentage of students of color and lower socio-economic status are placed in remedial education and never progress (Attewell, Levin, Domina, & Levey, 2006; Perry et al., 2010). When colleges continue to add additional courses as the only way to help students progress through remedial education, the institutions are in one sense dooming those students to low wage jobs (Complete College America, 2011). The California Acceleration Project (CAP) actively promotes redesigns of remediation sequences in English and math

that decrease the number of remediation levels and currently has 42 California community colleges participating in the project (CAP, 2013). In addition community colleges across the nation are also actively promoting fewer levels of remediation in order to accelerate students' progress (CAP, 2013). Table 1 shows the percentage of students who actually complete the college or degree applicable course as they move through the remedial education sequences in California community colleges.

Table 1

Percentages of Completion of Remedial Sequences in California Community Colleges

Level of Remedial Education	% who complete college/degree applicable course
3 levels below College Math (Pre-Algebra)	24
4 levels below College Math (Arithmetic)	13
3 levels below College English	21
4 levels below College English	17

Note: Adapted from "Course-Taking Patterns, Policies, and Practices in Developmental Education in the California Community Colleges" by M. Perry, P. Bahr, M. Rosin, & K. Woodward, 2010, Mountain View, CA: EdSource.

In addition to completion rates, Perry et al. (2010) examined placement rates and reported that African American students are more likely to be placed in the lowest level of remedial English compared to other ethnic groups. African American students are much less likely to be placed in the highest remedial English course compared to White students (40% of African American students vs. 64% of White students). Both African American and Latino/Latina students are

much more likely to be placed into the lowest level of remedial Math than are White or Asian students (Perry et al., 2010).

While a significant amount of research has focused on under-prepared students entering a community college with the goal of an associate degree or transfer, CTE programs are also challenged with the perceived under-preparedness of students (Baker, Hope, & Karandfeff, 2009; Rosenbaum et al., 2012; Shulock et al., 2011). Many CTE programs do not require students to complete any English or math prior to entering the program of study and a number of certificate programs do not require students to take a college assessment examination prior to enrolling in a course of study (Rosenbaum et al., 2012; Shulock et al., 2011). Although many high wage, high demand jobs can be secured with the completion of a certificate, employers also need workers who can compete in the global economy. The literacy, numeracy and computer skills necessary for 21st Century jobs are significant (Hart Research Associates, 2013; Northeastern University, 2013).

Career Technical Education

The origins of vocational education can be traced back to the apprenticeship agreements of colonial times, and has evolved over time through the influence of politics, economics, education and societal issues (Gordon, 1999). Currently in the United States, vocational education is offered by high schools, public community colleges or technical schools, private non-profit technical schools and private for profit technical schools (Gordon, 1999; Rosenbaum et al., 2012). Vocational education programs at community colleges have common characteristics such as types of programs: Nursing, Manufacturing, Welding, Heating and Air Conditioning, Computer Graphics or Medical Assisting. Faculty are often hired due to their work experience and credentials in the field, and may not possess a master's degree (Rosenbaum et al., 2012).

While CTE programs have been a part of the education pipeline for many years (both at the high school and community college) and have provided improved job skills for students, changes in the labor market have caused a significant skills gap for students (Symonds et al., 2011). For example, in 1973 up to 72% of America's workforce was made up of people with a high school education or less. However, by 2007 the picture had changed dramatically. While the number of jobs in the U.S. grew by 63 million, the total number of jobs held by people with a high school diploma or less shrank by 2 million indicating increased employer expectations (Symonds et al., 2011). Yet, the graduation rate for community college students who began in remedial courses was only 9.5% within 3 years indicating an urgency to find ways to increase completion rates (Complete College America, 2011).

Rosenbaum et al. (2012) conducted a comparison survey of seven community colleges and seven "occupational colleges," which were defined as, "accredited 2-year colleges that offer occupational programs, but are private rather than public" in Illinois to compare degree completion rates and to ascertain what factors contributed to improved completion rates for either group (p. 11). Their focus was on students who entered the institutions in order to obtain an associate degree in one of three vocational fields (business, health or computer technology) even though the college (particularly the community colleges) offered other types of programs such as other associate degrees, non-credit courses, and certificates. The analysis included statistical data collected by the colleges and interviews conducted with students and faculty. Rosenbaum et al. found that, overall, the occupational colleges had better outcomes for degree completion than community colleges, even when controlling for a variety of background characteristics.

As reported in Rosenbaum et al. (2012), the findings of this study were consistent with those of a previous 2005 research study conducted by Rosenbaum and Stephan using the National Education Longitudinal Study (NELS) database. Rosenbaum and Stephan found that 40.8% of community college students completed degrees within 8 years after high school as compared to 58.0% of students in occupational colleges. Moreover, according to Shulock et al. (2011), one-third of course enrollments in California community colleges were in some type of vocational course, but after 6 years only 3% earned a vocational degree and 8% earned a non-vocational degree. These findings and statistics are problematic considering that the AACC's 21st Century Commission (2012) report indicated approximately 15 to 20 million U.S. workers will be needed by the year 2025 to replace the aging and highly skilled workforce that is retiring.

In their study, Rosenbaum et al. (2012) also found five significant differences in processes and student expectations between community colleges and occupational colleges that contributed to increased completion rates at the occupational colleges. These differences are noteworthy in that occupational colleges approach their mission with the overarching attitude that the institution is responsible for overcoming a significant number of barriers for students while community colleges make assumptions about the students' own capacity and responsibility to overcome those same barriers. Occupational colleges, in contrast to community colleges, provided (a) packaged programs that offered a clear pathway to completion versus information overload that the student must navigate themselves; (b) simplified and compressed course schedules that enabled students to anticipate and coordinate with other life demands versus courses offered at varying dates and times that made working and juggling family responsibilities difficult; (c) information and guidance to assist students in making choices to

minimize student mistakes versus placing the burden of acquiring information on the student; (d) infused knowledge about soft skills (workplace norms) in all practices of the college rather than hoping the knowledge is transferred to students; and (e) proactive assistance in the job search with institution connections to employers versus the assumption that students have the job search skills necessary to find jobs on their own.

Embedded Remediation

Embedded remediation refers to the integration of reading, writing, and numeracy within the classroom content discipline or vocational pathway in order to accelerate students' progression and successful completion of college level courses (Baker et al., 2009; Casey et al., 2006; Perin, 2011). Similar terms and practices for embedded remediation include integrated learning and contextualized teaching and learning (Baker et al., 2009).

However, the use of discrete remedial courses has been the traditional means to help students improve their reading, writing and numeracy skills in the community college setting; although, this approach has resulted in limited success (Bailey et al., 2009; Baker et al., 2007; Rutschow et al., 2011). Over the last few years, a variety of reforms have been implemented to increase the number of students who move through the remedial education sequences and enroll and complete college level courses. However, most of these efforts have focused on content specific programs (reading, writing, math) with relatively few designed for CTE courses (Boroch et al., 2007; Complete College America, 2011; Perin, 2011; Shulock & Moore, 2007).

Moreover, recent surveys indicate that employers want graduates who, in addition to specific job skills or training, have the ability to think creatively and broadly (Hart Research Associates, 2013; Northeastern University, 2013).

According to Conley (2010), the conversation in higher education often implies an either or mentality rather than a both point of view regarding job training skills and broader thinking and writing skills. Currently, most CTE certificate programs at community colleges are focused on the technical aspects of a job. For instance, if a student is getting a certificate in welding, the majority of the courses are focused on welding. There is little to no emphasis on broad based skills such as writing, critical and creative thinking or interpersonal skills as those skills are discrete courses offered through other disciplines at the college (Alssid et al., 2002). The dilemma for community colleges is how to provide academic support systems in CTE programs without adding courses or time to completion (Alssid et al., 2002; Baker et al., 2009; Hoops, 2010).

Contextualized teaching and learning practices are generally formed around two broad categories: stand-alone classroom practices and linked courses or learning communities (Baker et al., 2009). Contextualized stand-alone classroom models can include infused academic courses that focus on academic skills building that is contextualized to the students field of study or life experiences. Another model includes an infused occupational course or courses where academic skills are taught in the context of the vocational competencies usually with both the academic instructor and vocational instructor engaging in some type of team teaching (Baker et al., 2009; Perin, 2011). Linked courses or learning communities with contextualized teaching and learning provide a cohort of students with courses that have a high degree of collaboration between academic and career pathway courses that are contextualized to the career (Baker et al., 2009).

Integrated Designs

Fully integrated models within CTE programs have been piloted over the last few years. For example, England launched an initiative to embed Literacy, Language and Numeracy (LLN) skills in its vocational programs to meet the needs of underprepared students (Casey et al., 2006). A "Skills for Life" curriculum was developed for instructors to use within the context of a vocational course. The LLN instructor could be the vocational education instructor or a basic skills instructor who team-taught the courses. The embedded LLN skills were implemented to varying degrees across England. To examine the impact of the embedded approaches, the National Research and Development Centre conducted a 5-year longitudinal study that included data for 1,916 students participating in 79 vocational programs in five sectors (Casey et al., 2006). The study found that retention was 16% higher in courses with embedded LLN. Furthermore, in fully embedded vocational courses, where the vocational instructor taught the skills, 43% more students achieved literacy qualifications and 23% more students achieved numeracy qualifications than students who were not part of an embedded LLN course. The study also found that 70.5% of students achieved certification in the vocational pathway with embedded remediation compared to a 55.5% certification rate without remediation (Casey et al., 2006).

Washington State has implemented a statewide integration design that embeds a basic skills instructor into a CTE pathway with the courses jointly taught by both instructors and often includes support classes such as supplemental instruction (Wachen et al., 2012). The Integrated Basic Education and Skills Training (I-BEST) model was launched to meet the needs of adult basic skills students and move them into college level work as quickly as possible. The Community College Research Center (CCRC) has conducted a series of studies

examining the effectiveness of the I-BEST instructional design (Wachen et al., 2012). A comparison study conducted by Jenkins, Zeidenberg, and Kienzl (2009) compared educational outcomes of I-BEST and non- I-Best Workforce students. The study looked at 809 I-BEST students and found that in all seven categories measured, IBEST students did significantly better than the comparison group. For example, 54% of I-BEST students earned a certificate during the 2-year period versus 18% of non-I-BEST students (Jenkins et al., 2009).

Tennessee's 27 Technology Centers offered technical and occupational programs and enjoyed a 70% successful completion rate (Hoops, 2010). The unprecedented success rates were attributed to a highly integrated institutional framework that included program structure; a competency-based, self-paced learning model; contextualized foundation skills; and supportive services (Hoops, 2010).

In California, a number of demonstration projects were funded beginning in 2007 by the California Community College Chancellor's Office and were re-funded in 2011 based on their early success. These grants were designed to create Career Advancement Academies (CAA) to improve completion rates of students obtaining certificates in designated career pathways that would result in family sustaining wage jobs. A key component of the CAA has been the integration of reading, writing, math and soft job skills within the technical field to accelerate student progress (Gash & Mack, 2010).

In addition to developing an integrated design, consideration must be given to different ways of approaching the pedagogy. The instructor must understand how students learn and how the brain works when learning new material (Caine & Caine, 1990; Dweck 2010). Relatively recent innovations have emerged from the field of brain-based research and a Habits of Mind model which, along with Carol

Dweck's work in fixed mindset versus growth mindset, provide new ways for faculty to develop engaged, self-regulated learners (Barr & Tagg, 1995; Caine & Caine, 1990; Costa & Kallick 2000, 2008; Dweck, 2006, 2008; Mueller & Dweck, 1998).

Integrated Pedagogy

Brain based research provides faculty with a greater understanding of the learning needs of students (Caine & Caine, 1990). Using new brain based research combined with learning centered classroom theory, colleges and faculty are better able to embed or integrate strategies that promote learning and improve outcomes for students (Barr & Tagg, 1995; Weimar, 2002). This level of integration usually requires changes in instructional strategies on the part of the instructor (Casey et al., 2006). For example, a pedagogy titled Reading Apprenticeship (RA) provides faculty with the tools and strategies needed to engage their students in reading the textbook for their discipline. This strategy capitalizes on meta-cognition as a tool to help faculty make their own reading process visible to their students and provides a variety of active learning strategies for the classroom. These practices help faculty think about ways to create reading communities so that students' reading and discussion about texts drive engaged learning rather than lecture and passive note taking (Schoenbach, Greenleaf, & Murphy, 2012; WestEd, 2010). Reardon Technical College in Washington State embraced RA as a campus-wide initiative that has become part of its college culture. Students are exposed to the concepts of RA throughout courses taken at the college. In the first 3 years of implementation, the college's measures of student retention and persistence grew from 61% to 74% (WestEd, n.d.).

Costa and Kallick (2000) identified at least 16 attributes that describe the intelligent behaviors (e.g. persistence, flexibility, critical thinking, problem

solving, etc.) humans employ when confronted with problems (see Appendix B). They referred to the practice of these attributes or behaviors as Habits of Mind. Costa and Kallick (2000) believed that these behaviors can assist both children and adults in school, as well as in life, to be successful and must be infused into classroom practice in order to help students take charge of their own learning (Costa, 1981; Costa & Kallick, 2008). Mueller and Dweck (1998) identify these behaviors as having a growth mindset versus a fixed mindset towards learning. Embedding the teaching and practice of habits that assist students in becoming self-regulated learners who lead productive lives can improve student outcomes (Costa & Kallick, 2008; Dweck, 2010).

Peer assisted learning has also been shown to improve student outcomes. A common form of peer assisted learning in higher education is Supplemental Instruction (SI), which has been used to improve student outcomes since the 1970s (Martin & Arendale, 1990). Originally designed at the University of Missouri Kansas City (UMKC), SI is an academic assistance program that utilizes peer-assisted study sessions where students compare notes, discuss readings, develop organizational tools, and predict test items. Students also learn how to integrate course content and study skills while working together (Martin & Arendale, 1990). Studies show an improvement by as much as one full letter grade for students who attend one or more of these sessions (Martin & Arendale, 1990; Zaritsky & Toce, 2006).

The College Reading and Learning Association (CRLA) offers certification for colleges and universities to train peer tutors and provides internationally accepted standards of skills and training for tutors. This is the most widely used model for colleges and currently certifies over 10,000 colleges, mostly in the United States. Their model for peer tutoring has a different focus than SI. In

general, peer tutoring sessions focus on the recipient student's questions and need to learn during the tutoring session (CRLA, 2014b). The peer tutor does not come with a pre-conceived plan of what will be covered in the study session. However, both types of assistance require extensive training to achieve effective outcomes (CRLA, 2014a; Martin & Arendale, 1990).

Learning Theory

Community colleges are seeking ways to effectively design curriculum pathways that will meet the needs of their diverse student populations. This effort includes the development of information delivery as well as the facilitation of learning for the student (Baker et al., 2009). Learning theory provides a conceptual framework that (a) explains how students learn and retain information, and (b) informs educators' practice both inside and outside of the classroom. The goal in applying learning theory is to achieve growth in the learner's thinking and acting (Merriman et al., 2007). This study used the lens of learning theory to analyze two different perspectives: the role of the learner and the role of the teacher. Each perspective is important as both the learner and the teacher bring significant elements to the learning environment that shapes the outcome for each student (Weimer, 2002).

Learning centered theory explains the environment that is necessary in the classroom and is focused on the role of the teacher to create such an environment and to embed remediation. Mindset is focused more on the role of the student and provides a foundation for the actual doing of embedded remediation as it relates to student needs as they move towards becoming self-regulated learners. Further, Mindset will assist in analyzing the data in relationship to the research questions.

Learning Centered Theory

Learning centered theory is grounded in work done by John Dewey during the late 19th and early 20th centuries (Rogers, 1983; Weimer, 2002). Dewey believed that students learned best by experiencing and participating in their own learning rather than being passive recipients of the knowledge of the instructor. Key components of his theory include an emphasis on learning by doing, problem solving and critical thinking, cooperative learning projects and the understanding of knowledge rather than rote memorization (Dewey, 1963).

As Jean Piaget expanded upon these ideas through cognitive learning theory, which explained how, when and why children develop and learn new concepts (Weimer, 2002), others such as Lev Vygotsky (social cognitive theory), Carl Rogers (student-centered learning), and von Glasersfeld (radical constructivism) added to the theory base. The result was a more holistic view of the learner and the learning environment. The basic premise of constructivism is that learning is an active knowledge construction process and builds upon prior knowledge of the learner (Dewey, 1963; Rogers, 1983; Weimer, 2002). Teachers become trainers and coaches who assist the learner in acquiring knowledge using techniques such as problem based learning, situated learning and experiential learning while becoming self-regulated learners (Rogers, 1983; Weimer, 2002).

Barr and Tagg (1995) believed that faculty, staff and administrators in institutions of higher learning need to place an increased focus on incorporating constructivist learning theory in the culture of the institution because "a college is an institution that exists to produce learning as opposed to one that exists to instruct*"* (p. 1). This view looks at learning holistically, taking into account the needs of the learner as he or she constructs knowledge while being guided by the

teacher. Students who are actively involved in learning this way are more likely to persist and graduate (Costa & Kallick, 2008).

Carl Rogers (1983) described another conception of learner- centered theory in what he called Student Centered Teaching: "Significant learning combines the logical and the intuitive, the intellect and the feelings, the concept and the experience, the idea and the meaning. When we learn in that way, we are whole, utilizing all our masculine and feminine capacities" (p. 20). This conception of learning goes well beyond cognition to involve every aspect of a student's being.

Learning Centered Classrooms

In 2002, Weimer coalesced the major ideas of a learning centered classroom in her book, *Learner Centered Teaching: Five Key Changes to Practice*, and outlined five pillars of a learner centered classroom for higher education. These five pillars inform this research study and serve as the lens for conducting observations in selected classrooms.

The balance of power. In the traditional paradigm, all learning is centered or focused on the teacher (Barr & Tagg, 1995). This paradigm posits that the entire structure of the learning process is controlled and developed by the teacher as something to be done to the student; in essence, students are absolved of any responsibility for their own learning (Barr & Tagg, 1995). In the learning centered classroom, power must be shared with students (Barr & Tagg, 1995; Weimer 2002). The goal in this type of classroom is to provide students with the skills necessary to eventually teach themselves. This process is often referred to as self-regulated or self-directed learning (Rogers, 1983; Weimer, 2002).

In constructivist learning theory, the student must be involved in constructing his or her own learning with guidance and insight from the teacher

(Rogers, 1983). By adjusting the balance of power in the classroom, the teacher provides a space for the student to engage in the learning process and to share their newly found knowledge with others (Weimer, 2002). As students and the teacher engage in the material together and share the learning journey, deep learning takes place (Barr & Tagg, 1995).

The function of content. Content is of utmost importance in any classroom, but in a learner centered classroom the purpose of content is to establish a knowledge base and to promote learning (Weimer, 2002). The teacher uses content to help students develop the skills or strategies of a learner, which then enable the students to acquire the knowledge of the discipline. The content is also used to help students think about and become aware of their own learning (metacognition) and to allow the students to be actively involved in the learning process. This involvement reinforces the role of self-regulated learners (Barr & Tagg, 1995; Dewey, 1963; Rogers, 1983; Weimer, 2002).

The role of the teacher. In a learning-centered classroom the role of the teacher becomes that of a guide or facilitator. This type of learning focuses on the facilitation of learning, and not simply conveying knowledge from the teacher to the student. In other words, the learner and teacher become co-facilitators of the learning process (Rogers, 1983). This role is a paradigm shift for many teachers in higher education. For instance, in the community college setting, faculty are hired based on their expertise in a specific discipline and rarely have training in learning theory or pedagogy (Minter, 2011). Consequently, faculty members frequently fall back on the methods used in their own educational experiences, which were often more teacher-centered than learning centered. This lack of training in learning theory and pedagogy presents challenges for faculty as they seek to meet the needs

of their students in an ever evolving, ever changing learning environment (Minter, 2011; Weimer, 2002).

Dweck (2008) goes further in outlining the role of the teacher in a learning centered classroom stating that we should praise and reassure our students by "focusing them on the process they engaged in - their effort, their strategies, their concentration, their perseverance, or their improvement" (p. 3). Dweck and her colleagues studied the effects of praising students' intelligence rather than praising the students' effort for over 10 years (Mueller & Dweck, 1998). Their research consistently found that those students who were praised for their intelligence lost confidence and motivation, had a decrease in their performance and almost 40% of them acted ashamed of their failures by lying about their scores (Mueller & Dweck, 1998). Thus the role of the teacher in the learning centered classroom as a coach and an encourager of effort is important and necessary for helping students to construct their own learning (Barr & Tagg, 1995; Dweck, 2008, 2010).

The responsibility for learning. In the learning centered classroom, as more power is progressively shared, students begin to take responsibility for their own learning (Costa & Kallick, 2000; Weimer, 2002). In order for deep learning to take place, rather than the memorization of specific pieces of information for stand-alone and often unrelated classes, the college learning centered classroom focuses on how the student learns, not just what the student learns (Barr & Tagg 1995). This focus provides students with the process and tools needed to become the self-regulated learners that so many faculty desire (Costa & Kallick, 2004; Dweck, 2010; Weimer, 2002).

However, in addition to empowerment, other factors may affect a student's ability to become self-regulated. Dweck and Legget (1988) identified a distinction between entity trait beliefs (the belief that traits are fixed and cannot be

developed) and incremental trait beliefs (the belief that traits are evolving and can grow and change). In later work, Dweck (2006) labeled these traits as a fixed mindset versus a growth mindset. Dweck and her colleagues have conducted multiple studies (Mueller & Dweck, 1998; Dweck, 2006, 2010) that have consistently found that one's beliefs or mind-set toward learning has a direct influence on a student's academic performance. For example, students who believe that people are born smart are less likely to do well when confronted with new and challenging tasks (Dweck, 2010). On the other hand, students who believe that learning is something to be built upon are more likely to persist towards new knowledge and ways of doing things (Dweck, 2010).

The purpose and processes of evaluation. In the traditional college classroom, the expectation for evaluation focuses primarily on grades that are based on the teacher's assessment of work. Grades are assumed to indicate that learning has taken place (Barr & Tagg, 1995; Weimer, 2002). However, in the learning centered classroom, the focus of evaluation shifts to that of learning versus memorization for a grade. Research by Church, Elliot, and Gable (2001) supported the idea that a focus primarily on grades, particularly if the grading is perceived as difficult, provides an environment where students become experts at adopting performance goals rather than mastery goals. In this context, learning is often left at the door of the classroom and not transferred to the next learning environment (Barr & Tagg, 1995; Weimer, 2002). This finding does not mean that grades are unimportant; the role of the instructor in evaluation of students and the use of grades to measure learning is vital. However, as students become part of the evaluation process they learn how to assess not only their own work, but that of others as well (Weimer, 2002).

At the heart of learning centered theory is the goal of active participation on the part of both the learner and the teacher. The learners must bring their own motivation as well as prior knowledge, skills, opinions and ideas to the learning setting and the instructor must bring a philosophy of learning that provides an environment for the student to move towards becoming a self-regulated learner (Costa & Kallick, 2000; Merriam et al., 2007; Weimer, 2002).

Summary

Developing key strategies to address the needs of under-prepared students is of utmost importance within the community college setting. Current methods employed to address remedial students' needs are ineffective and in need of reform. It is clear that students who start their post-secondary school journey in the basic skills sequence of courses rarely succeed in attaining a vocational certificate, associate's degree or transfer to a four-year university. The statistics on failure rates, particular for students of color and low socio-economic status are even more dismal.

Vocational education is one way that students can improve their socio-economic status by earning certificates in high demand, high wage jobs. However, even in this environment, students are under-prepared for the demands of the career pathways they have chosen. Most entry level vocational programs do not require students to take the college placement exam and do not require the completion of the basic skills sequence in reading, writing or math even though the career pathway has expectations that students have the literacy and numeracy skills necessary to succeed in the class and compete in the job market.

Embedded remediation or integrated learning shows new promise for assisting students in successfully completing vocational certificates as well as their intended post-secondary career goals. This effort will require a commitment on the

part of instructors to reflect on existing practices, engage in revising those classroom practices and implement new class models that are focused on student learning rather than teaching. However, there is not much literature that addresses embedded remediation best practices or integrated pedagogies in community colleges, especially in the area of vocational education.

CHAPTER 3: METHODOLOGY

This chapter begins with a review of the study's purpose and research questions. The chapter then provides a description and rationale for the research methodology, sampling, data collection methods, and data analysis procedures. Also, techniques for ensuring the trustworthiness of the research are provided and limitations are discussed.

Review of the Purpose and Research Questions

The purpose of the research study was to explore the implementation of embedded remediation in designated CTE pathways at selected California community colleges in an effort to identify promising practices. Five research questions were used:

1. How can embedded remediation at each case study community college be characterized and how did the implementation evolve?

2. How are faculty trained to embed remediation?

3. How do faculty members perceive that the implementation of embedded remediation has affected student learning, completion and preparation for employment?

4. What recommendations do faculty members have for embedding remediation in CTE programs?

5. How do students perceive embedded remediation in relation to their learning?

Research Design

Qualitative Methodology

The goal of qualitative research is to gain a deeper understanding of a particular question (Creswell, 2003). Through the lens of social constructivism, in

which individuals subjectively interpret their experiences to find meanings (Creswell, 2009), this research methodology sought to understand how participants derived meaning from their surroundings as well as how that meaning influenced their behavior (Creswell, 2003; Merriam, 2009). The aim of this study was to gain a holistic understanding of the types of strategies and interventions that can be used to embed the remediation of basic skills into designated Career Technical Pathways, a detailed understanding of the implementation process for embedding remediation and insight into faculty and student perceptions of such strategies on student learning. Answers to the research questions were pursued through interviewing faculty members involved in implementing embedded remediation strategies and interventions, conducting focus groups with student participants in designated career pathways, observing classrooms, and reviewing archival data and documents.

The use of multiple cases, data collection methods (classroom observations, interviews, focus groups) and data sources (documents, transcripts and field notes) in this study provided opportunities to compare data across sources to triangulate themes and subthemes. Triangulation, which involves the use of multiple data sources and methods, is a strategy used in qualitative research for strengthening validity and reliability (trustworthiness) (Creswell, 2003; Merriam, 2009; Stake, 1995; Yin, 1994). Moreover, the development of protocols and a case study data base, as recommended by Yin, further strengthened reliability of the research.

Case Study Approach

The research design is a qualitative multi-case study comprising three community colleges in California. A case study approach was chosen as it allows the researcher to focus on a specific event or activity and develop a detailed look at what is occurring (Creswell, 2003; Stake, 1995). As explained by Stake, a

researcher can gain insight into a particular question, such as how to effectively implement embedded remediation strategies, by studying a particular case. Yin (1994) explained a case study as a research strategy that "attempts to examine: (a) a contemporary phenomenon in its real-life context, especially when (b) the boundaries between phenomenon and context are not clearly evident" (p. 13).

Sampling and Participants

Cases

Three California community colleges were selected based on purposeful, criterion-based sampling that included four criteria: (a) participated in the Consortium TAACCCT grant; (b) implemented at least one new strategy that embedded basic skills in a designated career pathway; (c) implemented a new strategy in fall 2012, spring 2013 or fall 2013; and (d) provided the researcher with access to relevant documents and participants. Moreover, each of the cases had implemented a different career pathway thereby enabling the research to include embedded skills application in three vocational areas.

The California colleges selected for this study were 2-year public community colleges. To preserve the colleges' confidentiality, they are referred to as Urban Community College (UCC), Agriculture Community College (ACC) and Suburban Community College (SCC). Each college is a member of the Consortium participating in the TAACCCT grant initiative and has either redesigned designated career pathways or developed and designed new pathways to meet the requirements of the TAACCCT grant.

According to its website, UCC has a multiethnic student population of approximately 22,000, and over half are under age 24. The college is located in the center of one of the largest cities in California. Its service area encompasses two

counties that cover a large geographical area. The college has a long history of offering career technical education in multiple disciplines. For the Consortium project, UCC chose to focus on redesigning programs in the allied healthcare field.

ACC is a medium-sized college located in a small agricultural based community in an economically depressed area. According to the college website, ACC is part of a larger district that serves an extensive geographical area. ACC serves just under 10,000 students at its main campus and centers. A majority of the student population is Hispanic. ACC offers Associate of Arts and Associate of Science degrees as well as certificates in a variety of career technical education pathways. The college's agricultural program is one of its strongest assets and ACC chose this as one of the pathways in the Consortium initiative.

SCC is a large suburban college with a large geographical service area and enrolls approximately 25,000 students per year. According to the college's web site, over 75% of the students are below the age of 30 and 80% need more than one remedial course upon enrollment. The college offers Associate of Arts and Associate of Science degrees as well as certificates in a wide variety of career technical education pathways. For the Consortium initiative, the college selected one of the health career pathways.

Participants

The participants in the study were comprised of representatives from each of the three colleges. Two faculty and one peer tutor were interviewed at each college. The rationale for this selection was based on the team approach developed by the colleges, utilizing the expertise of the CTE faculty member(s) and the basic skills faculty member (representing math or English). In addition, the designated CTE program had committed to the use of peer assisted learning within the program. Interviewing a representative of each area provided multiple viewpoints

regarding the development and implementation of embedded remediation. The number of students in the focus groups was 10 at UCC and SCC, and eight at ACC. The focus group participant number was based on Krueger's and Casey's (2009) suggestion of 5 to 10 participants.

Each college participating in the study had previously designated a primary contact person for the TAACCCT grant; this person is referred to as the college lead for the grant and in this research study. The college lead for each campus was asked to facilitate contacting qualified faculty participants who were involved in the TAACCCT grant and had redesigned their course or program. Once faculty had been identified and contacted, they were asked to select the course for the observation visits. Volunteers also were sought for the student focus groups.

Researcher as the Instrument

Creswell (2009) stated that one of the common characteristics of qualitative research is the researcher serves as the "key instrument" (p. 175) for collecting data. Creswell also stated that because qualitative research is interpretive, researchers "explicitly identify reflexively their biases, values, and personal background . . . that may shape their interpretations formed during the study" (p. 177). This openness and reflexivity strengthens the validity of the study (Creswell, 2009). Using Creswell's guidance, it is important to note that I currently work as a Basic Skills Coordinator for a California community college and am somewhat familiar with TAACCT grants. My prior experience in the community college setting has also included the role of counselor and instructor, as well as work on an Outcomes and Assessment committee, Institutional Research and Effectiveness Committee and taskforces on student success.

As a result of my work with the California Basic Skills Initiative, I am aware that many students are not successful in their attempts to earn a community

college degree or certificate, or to transfer to a four-year university. I have come to realize that the current way of teaching often is not effective and has a disproportionate impact on minority students. Through this study I expected to gain critical insight into classroom practices that improve student completion rates and to discover promising practices for embedding remediation.

My previous experiences in program evaluation and student learning assessment, as well as my study of research methodologies and processes provided a foundation for this study. A large body of research exists regarding basic skills students and their lack of success in completing college goals. This study will add to the research by providing insights into promising practices for embedding remediation in career technical pathways and facilitate student completion rates. To help minimize researcher bias reflexivity was utilized, reflections were recorded in the field notes after each interview and focus group, as well as during observations.

Data Collection Methods and Procedures

Gaining Access

Each college participating in the TAACCCT has a designated college lead for the project. This person was contacted by email to explain the purpose, design of the study and reasons for selecting that particular campus. After clarifying the study and outlining the research expectations, each college lead was asked to be the point person for contacting participants.

After confirming point person support and agreement that the college would participate in the research study, the appropriate administrator was contacted to complete paperwork and the college's Institutional Review Board

requirements. Once access to the campus was granted, faculty, tutor and student participants were identified.

The college leads made the initial introductions to the faculty regarding the research study through an email and provided the researcher with the names and email contact information for all identified faculty. Individual emails were sent to each potential participant faculty member providing an overview and explanation of the research project. The college lead was copied on all correspondence with the faculty. Subsequently, interviews were scheduled with two faculty members and one peer tutor at each site. The faculty members taught in the designated career technical education pathway or taught basic skills on the designated college campus and were involved in the embedded remediation for the grant project. The peer tutor was embedded in the career technical pathway being studied. Prior to conducting the interviews all participants were emailed a copy of the participant consent form (see Appendix C) and interview questions (see Appendices D & E).

A second email was sent to the faculty members asking to schedule observation sessions in their classrooms. At UCC, the first observation session was conducted on the same day that faculty and tutor interviews took place. The second observation session was conducted on the same day as the student focus group. At ACC the first observation was on the same day as the student focus group and tutor interview. The second observation was conducted on the same day as one faculty interview. The second faculty interview was conducted at a different time due to the faculty member being called to a meeting. At SCC the first faculty interview and the focus group were conducted after the first observation. The second faculty interview and the tutor interview were conducted on the same day as the second observation.

Lastly, faculty were asked to announce in their classes the need for volunteers for a focus group. The selection criterion was that students must have been enrolled in one of the designated CTE pathways for at least one semester. The faculty member at each campus made the arrangements for a room to conduct the focus group and provided the researcher with a list of the volunteers. The students were offered pizza and sodas or water during their participation in the focus group.

Individual Interviews

One hour semi-structured, face-to-face interviews were scheduled at each college in the study with two faculty members in the TAACCCT initiative and one embedded peer tutor. The intent was to interview one CTE faculty member and one basic skills faculty member; however, two colleges did not embed a basic skills faculty member in the program. At those colleges two CTE faculty members were interviewed. The faculty members interviewed at UCC and ACC were both instructors in the CTE program. At SCC one faculty member was an instructor in the CTE program and one faculty member was an English teacher who facilitated the basic skills remediation in the program. Although a full hour was scheduled for each interview, the full 1 hour was not needed. The duration ranged from 20-40 minutes. The shorter interview times were often due to restricted availability of faculty. The tutor interviews lasted from 22 to 26 minutes. The CTE faculty members selected the tutors to be interviewed, facilitated arrangement of the date and time and provided a room to conduct the interviews. The tutor interviews were scheduled on a day that a classroom observation, faculty interview or focus group was scheduled.

The semi-structured interview format was used to allow flexibility in conducting the interviews. Semi-structured interviews are guided by pre-

determined questions but are not so scripted that the respondents' answers can be predicted in advance. The interviewee's responses to the pre-determined questions guide the follow-up questions and require the researcher to improvise within the interview (Wengraf, 2001). The interviews consisted of a specific set of questions that helped to answer the research questions, but interviewee's responses provided the basis for follow-up questions and the order in which the questions were asked. Initially, the faculty interview questions (Appendix D) were also to be used for the tutor interviews, based on the thought that tutors were part of the learning team in the classroom and would be familiar with the terminology and processes of embedded remediation. However, the first tutor interviewed revealed that the level of understanding of embedded remediation by the tutors was limited. Based on reflective notes, a new set of questions was developed for subsequent tutor interviews (Appendix E).

Also, an interview protocol was utilized to provide consistency and to assist in organization of thoughts throughout the interviews (see Appendix F). The interview protocol helped to insure that all appropriate interview measures (e.g., confirming permission to digitally record the interview, concluding thoughts, information on ending the interview, follow-up information, and thanking the respondent) were completed. Field notes written throughout the interview process were reviewed soon after the interviews and any necessary adjustments (e.g., probing questions) were made to ensure accuracy.

Focus Groups

Student focus groups were held on each college campus and lasted between 30 and 45 minutes. CTE faculty notified students regarding the purpose of the research study and the need for focus group participants. Students were asked to volunteer to participate in the focus group and were given the opportunity to sign

up. Each college handled the selection of focus group participants differently. At UCC, students were offered five extra credit points in the class for participating in the focus group. Ten students signed up and participated. The CTE faculty members indicated that they would assure the students were available on the day the focus group was scheduled. At ACC, the CTE faculty members selected eight focus group participants. The faculty wanted to use participation in the focus group as a reward for students who were doing well in the program. At SCC the student participants were recruited by the CTE faculty member and were notified by the faculty member about the date and time. There were 10 volunteers for the SCC focus group. All focus groups were conducted in a classroom provided by the college and the researcher provided pizza and a soft drink or bottled water during the session. The focus group participant consent form and protocol are found in Appendices G and H.

Focus groups are useful when conducting exploratory research to gain an in-depth understanding of the effect of a particular stimulus (Vaughn, Schumm, & Sinagub, 1996). In this study, the stimulus, or phenomenon of interest was embedded remediation. The focus group was guided by semi-structured questions designed to assist in answering the research questions (see Appendix I). The order of the questions and the follow-up questions was guided by responses from the students. The focus group was digitally recorded and later transcribed by a professional transcriptionist.

Classroom Observations

Two 1-hour classroom observations were conducted at each campus. The researcher and classroom instructor established the dates for the observations. The purpose of the observations was to understand the use of the embedded remediation techniques within the classroom and to make field notes on the

reactions of students during the use of these strategies. As stated by Creswell (2009),

> Qualitative observations are those in which the researcher takes field notes on the behavior and activities of individuals at the research site. In these field notes, the researcher records, in an unstructured or semi structured way (using some prior questions that the inquirer wants to know), activities at the research site. (p. 181)

Each observation was conducted during the same timeframe and in the same classroom each time. However, the topic of the class for the day was different for the follow-up observation. Efforts were made to conduct the observations within 1 week of each other but this was not possible at one site due to the college's scheduled spring break. The observation protocol can be found in Appendix J.

Document Review

Documents provide an important source of data in qualitative research and were utilized in this study. The term documents "is broadly defined to include public records, personal papers, popular culture documents, visual documents, and physical material and artifacts" (Merriam, 2009, p. 162). The participating colleges were asked to provide documents regarding their participation in the TAACCCT grant and embedded remediation. Also, the Consortium's lead college had a portal for all redesign teams to place documents regarding implementation of the grant, and the researcher requested and was given access to documents relevant to the scope of the study. Examples of relevant document types included lesson plans, course syllabi, course of record outlines, program descriptions, meeting minutes, and faculty training session agendas. All of the documents used throughout the study were available online and easily downloaded. The documents were analyzed for content related to embedded remediation within the designated career pathways. These documents provided meaning and an understanding for

each college's implementation of embedded remediation within the institutional context, thereby contributing insight in answering the research questions.

Field Notes

As indicated by Merriam (2009), field notes are a written account of observations made by the researcher. According to Merriam, the field notes should be highly descriptive and include observations of "the participants, the setting, the activities or behaviors of the participants, and what the observer does" (p. 130). Field notes were used to record individual interview, focus group and classroom observations. In addition, field notes were used to note probing questions during interviews and focus groups. The notes also served as reminders for follow-up questions inspired during the interviews, a guide for monitoring the interview process, and a data collection method. During the classroom observations the field notes included both descriptive and reflective notes, as suggested by Creswell (2003). Hand written reflective notes also were recorded and subsequently transcribed into Microsoft word documents. As recommended by Merriam, the field notes were typed as soon after the interviews as possible. For this study, the hand written field notes were typed within 3 days and saved in a document Microsoft Word file on the researcher's external hard drive.

<div align="center">

Ethical Considerations

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Prior to any contact with participants, approval to conduct the research project was sought and received from the California State University, Fresno Institutional Review Board. The researcher then contacted the leadership of the participating community colleges to gain permission to conduct the research at their respective campuses. All participants were 19 years of age or older and signed the participant consent form. Confidentiality of the case institutions and

participants were preserved through the use of pseudonyms and careful management of the data. Throughout the study, data were stored on an external device and locked in a secured location accessible only to the researcher.

Data Analysis

Content Analysis

A content analysis was conducted for documents, field notes, observation notes and transcripts. As described by Merriam (2009), "content analysis is a systematic procedure for describing the content of communications" (p. 152). After documents were located, they were analyzed to determine characteristics such as the author, the reasons for being written, audience, context in which they were written, authenticity, and bias (Merriam, 2009).

A professional transcriptionist transcribed the digital recordings of the interviews and focus groups. As recommended by Creswell (2003), these transcripts along with other textual data (e.g., field and observation notes) were read through as a first step to "get a sense of the whole" (p. 193). These data were then reviewed multiple times to begin the open coding process. The open coding system enabled initial development of common themes while collecting data, produced insights for ongoing field work, and afforded opportunities to make necessary adjustments to the study. Words and phrases (e.g., communication, teacher support, tutoring, embedded remediation, learning and training) began to emerge from the initial faculty and tutor interviews that shaped the broad organization of the data. By combining the open coded data categories through the use of focused coding, the data were further condensed into fewer categories. Some codes were in multiple categories because of overlapping ideas. After each

case had been individually analyzed, a cross-case analysis was conducted to facilitate identification of promising practices (Creswell, 2003; Yin, 1994).

Data Management and Storage

NVivo 10 is software used for analysis of qualitative research data and was used in this study to code the data and identify emergent themes. The software helped the researcher manage and codify various types of data. Some documents such as field notes, digital recordings and a methodological log were created and maintained directly in the NVivo 10 program. Other documents were scanned or transcribed (e.g., field notes, interview and focus group recordings, and handwritten work) and imported into NVivo 10 for analysis. Ultimately, all the field notes, documents, interview and focus group transcripts and classroom observations were coded using NVivo 10, and categories pertaining to the implementation of embedded remediation at the case study institutions emerged. Additional coding was accomplished manually to further refine some of the themes.

<center>**Trustworthiness**</center>

While qualitative research must provide rigor and quality of research, the concepts to accomplish the task are not the same as in a quantitative research and have often been the topic of intense debate (Creswell, 2003; Lincoln & Guba, 1985). The trustworthiness of qualitative research includes credibility, confirmability, dependability and transferability, as discussed by Lincoln and Guba.

Credibility or validity is central to qualitative research and refers to how believable the analysis and interpretations of a study actually are (Creswell, 2003; Guba & Lincoln, 1982). Various measures can be used to account for a study's

credibility such as triangulation, member checks, rich, thick descriptions and peer debriefing (Creswell, 2003). A case study's credibility can also be strengthened by creating a database for the case study and a chain of evidence between questions, data collection and conclusions drawn (Yin, 1994). The credibility of this study was established through the use of multiple sources of data (multiple campuses, multiple classrooms, faculty and students) as well as multiple methods of collecting data (interviews, focus groups, classroom observations, field notes and documents). Bias was controlled for by collecting data from a variety of sources and individuals with various perspectives about embedding remediation strategies in CTE classrooms. In addition, a case study database that assembled the evidence separately from the case study report further strengthened the credibility of the study.

Confirmability deals with the objectivity of the study and is the concept that "the data can be confirmed by someone other than the researcher" (Conrad & Serlin, 2006, p. 417). However, in qualitative research the focus is on the idea that the findings are objective and represent the participant's point of view rather than the researcher's perspective (Creswell, 2009; Lincoln & Guba, 1985). Methods used to establish confirmability may include triangulation, reflexivity or a confirmability audit (Lincoln & Guba, 1985). Confirmability of this study was strengthened through the use of reflexivity and triangulation. Reflexivity is when a "qualitative researcher systematically reflects on who he or she is in the inquiry and is sensitive to his or her personal biography and how it shapes the study" (Creswell, 2003, p. 182). In this study reflexivity was used while writing field notes soon after the interviews and focus groups, as well as during classroom observations. Also, triangulation of multiple data sources during the analysis provided additional confirmability.

Miles and Huberman (1994) defined dependability as "whether the process of the study is consistent, reasonably stable over time and across researchers and methods" (p. 278). The level of stability or dependability is considered after taking into account changes in the environment that is studied as well as any changes in the research design (Conrad & Serlin, 2006). Yin (1994) stressed the importance of documenting the procedures followed in the case study to strengthen reliability or dependability. Maintaining detailed records of the research design, including protocols and implementation processes, supported the dependability of this research study. A case study data base was created to house all the evidence so that other researchers could view it directly and not depend on the written report.

Transferability refers to the study being useful in another context in order to provide insight to another group or setting (Conrad & Serlin, 2006). Thick, rich descriptions of the context and setting assist in transporting readers to the setting and providing the reader with a shared experience (Creswell, 2003). The detailed descriptions of the three case studies allow readers to identify with specific components that may be applicable to their own colleges or classrooms. The overall aim of this study was to identify promising practices for embedded remediation in career technical courses that could be adapted for use at other community colleges.

Limitations and Delimitations

Including only three of the 10 colleges participating in the TAACCCT grant is a limitation of this study. Not all of the participating colleges had implemented embedded remediation during the timeframe of the study and the time constraint within which the study needed to be completed, partially driven by the conclusion of the grant, precluded the selection of additional colleges. A second limitation inherent in qualitative case studies is lack of generalizability;

however, thick, rich description enables the readers to determine what aspects of the research and promising practices are transferable to their own context.

A delimitation in the research design and sampling involved the location of the case study institutions. Based on the diversity of community colleges in the United States, urban, suburban and rural contexts were purposefully selected. However, community colleges are oriented toward the communities they specifically serve and the study results are influenced by unique characteristics of the institutions participating in the study.

Summary

The qualitative case study design enabled the gathering and analysis of a wide array of data types and information that focused on a specific phenomenon (embedded remediation). The case study institutions were selected based on purposeful, criterion-based sampling that included four criteria: (a) participated in the Consortium TACCCT grant; (b) implemented at least one new strategy that embedded basic skills in a designated career pathway; (c) implemented a new strategy in fall 2012, spring 2013 or fall 2013; and (d) provided the researcher with accessibility to relevant documents and participants. Purposeful sampling was used to select faculty, students and classrooms. Documents were obtained either through the lead institution's website or provided directly to the researcher. Data from interviews, field notes, and documents collected throughout the study were used as part of a holistic analysis process. Content analysis and categorical grouping were utilized to discover common themes related to the embedded remediation implementation. The data management and analysis processes were facilitated in part by using the NVivo 10 software program.

CHAPTER 4: RESULTS

In response to a Department of Labor Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant, 10 colleges throughout a large, geographic region of California joined together to create a "single consortium with a single focus" according to the Consortium grant narrative.   Based on growing evidence that narrowly focused interventions produce very limited outcomes (Illowsky, Malloy & Deegen, 2013; Rosenbaum, et al., 2012; Rutschow et al., 2011), Complete College America (CCA) strongly recommended that colleges implement eight actions to provide a comprehensive redesign of program structures (Consortium grant proposal). The key element of the Consortium grant proposal was that all 10 colleges would adopt these eight guiding principles for program redesign. The grant was funded and the "Single Structure Strategy" defined the Consortium's activities. A list of the eight principles and their definitions can be found in Appendix A.

Creating opportunities for deep student learning rather than basic memorization is a challenge for faculty in all disciplines in higher education. It is particularly challenging for CTE programs due to the depth of technical knowledge that must be learned in a short amount of time. This study focused on only one of the eight actions recommended by CCA, embedded remediation, which is defined in the Consortium grant proposal:

> Most remediation should be embedded into the program curriculum, supplemented as necessary through instruction that is parallel and simultaneous to the program, rather than preceding it. Students should develop stronger math and English skills as they build program competencies, using the program as context, and there should be clear basic skill outcome expectations with rigorous assessment.

The participant colleges attended a Convergence in June 2012 to focus on a Consortium-wide understanding of embedded remediation. It was collectively determined that embedded remediation was something that took place within the program and did not require students to go somewhere else on campus to experience the remediation. Further, the colleges narrowed down student interventions for embedded remediation to include, Reading Apprenticeship, Peer Tutoring, and Habits of Mind. These interventions were recommended to the colleges for implementation. The researcher wanted to discover if the experience of the Consortium colleges would yield promising practices for implementing embedded remediation into CTE programs that could be used by other community colleges.

In this chapter the findings, which address all the research questions for each case-study college, are reported and then a cross-case analysis is conducted to identify common themes and practices, as well as differences in the implementation of embedded remediation at the three colleges. This holistic analysis provided insights from which promising practices for implementing embedded remediation emerged. The colleges collectively used four approaches to embed remediation: peer tutors, faculty availability to students, additional basic skills information and a flipped classroom. In order to protect the confidentiality of the institutions and participants, some of the reference citations are nonspecific and participants have been given pseudonyms.

Urban Community College Case Study

Context

Urban Community College is a large California community college with over 22,000 unduplicated students in fall 2012 (UCC Web site). The College

offers pathways for obtaining associate degrees, transferring to a 4-year institution and obtaining career technical education. Over 80% of students require remediation. The racial/ethnic make-up of the college is diverse with the largest ethnic group (47%) being persons of Hispanic or Latino origin, followed by White persons (not Hispanic) 24%, Asian persons 17%, and African Americans (non-Hispanic) persons 8%, with the remaining groups at approximately 6%. The median household income in the college service area is reported at $46,430 and the percentage of persons living below the poverty line is 23% (UCC Web site).

UCC is situated within the urban center of one of California's largest cities. It is also at the core of one of a large county in California and has a largely agricultural economic base. In 2011, the college was asked to participate with a consortium of colleges who were applying for a Department of Labor TAACCCT grant (Consortium website). The college administration agreed to participate and provided assistance to the lead college in writing and submitting the grant (Consortium website). The allied health program at UCC is a large, robust program that offers degrees and certificates in a variety of health related careers. Some of those are short-term certificates such as the 4-month Medical Assisting program and others are longer 2-year programs such as Registered Nursing and Radiologic Technology.

The designated college lead at UCC indicated interest in supporting this research project and made herself available to assist the researcher. The faculty leads for the designated pathway were equally interested in assisting the researcher and made themselves and their classrooms available for the study.

Program Description

The designated pathway program at UCC is a 2-year certificate program that culminates with the student taking state and national examinations for

certification as a radiology technologist. The first year of the program is a mix of lecture and practice of x-ray positions. Students use the clinical rooms to practice positioning on each other and attend lectures Monday through Friday. The program requires approximately 40-50 hours per week of class and lab time. During the second year of the program, considered the clinical rotation, students are placed in clinics and hospitals under the supervision of the Clinical Director of the program. This clinical rotation is Monday-Friday from 8:00 am – 5:00 pm (UCC Radiological Technology Program Description).

Students are required to have fulfilled a number of prerequisite courses in the sciences to apply for the Radiologic Technology program. English and math are strongly suggested, but not required, and many students have completed the requirements for an associate of science degree by the time they are admitted to the program. The program uses a computerized, statistical lottery process to select students for admission, as small class sizes require limiting enrollment (UCC Radiologic Technology Program Description).

The Radiologic Technology program is both academically rigorous and physically demanding. As one faculty member at UCC stated,

> I don't really think personally that the program is that difficult, but it is very demanding, and there's a difference there between difficult and demanding. Difficult is when the stuff is hard to understand and things like that. Demanding is when it's just overwhelming. (Jeremy, personal communication, February 19, 2014)

However, both faculty members indicated that students struggled with some basic reading, writing and math skills in the program.

The Radiologic Technology program was part of the Consortium TAACCCT grant from the beginning. The division dean, in consultation with the department faculty, made the commitment to redesign this program to improve student outcomes. The redesign included all eight actions from the Consortium

grant; however, this study focused on how embedded remediation was implemented.

Embedded Remediation

Two CTE faculty and one tutor were interviewed at UCC to determine what type of embedded remediation is used in the Radiologic Technology program and how it evolved. Initially, the faculty members chose to use embedded tutors as their main remediation tool. The primary format of having embedded tutors draws from the highly acclaimed international model of Supplemental Instruction (SI). In this model, a student who has taken the course previously becomes the tutor in the same course, with the same instructor the next semester or year. One reason for selecting this intervention is that UCC has a very effective SI model through the campus Tutorial Center. The UCC model was modified to meet the needs of a community college and has been in operation for 7 years (UCC SI Program Review).

Yet, even this modified format proved to be challenging for the program. Faculty referenced the ultimate goal of CTE programs, which is for students to get a job in their field of certification. A radiology technologist can make over $70,000 per year and tutors are paid $8.00 per hour. It seemed unlikely that a student would want to return to the program as a tutor rather than seek a position in the field for which they trained. However, at the beginning of the implementation phase in fall 2012, the program used two former students who were waiting to take the national certification examination. This approach worked well until the end of the first semester when the two tutors passed their exam and were hired full-time in the field.

The CTE faculty finally decided to utilize second year students as tutors for the first year students. The tutors were able to count the tutoring time towards their

clinical hours during the second year. The CTE faculty reported that this arrangement has worked out well for the program. The tutor that was interviewed also believed this is a good way to work the tutoring. Leah stated that being a second year student enabled her to be helpful as a tutor, "That's what I'm here for is to just help them along the way and to clarify things that they're afraid to go to the teachers for. Make it more approachable" (personal communication, February 19, 2014). The tutor is in the lecture 1 day per week to stay up to date on what topics the students are learning. She provides tutoring for students during lunch and after classes and assists during class when they are in groups.

The lab portion of the program also has tutors. These students meet with the clinical coordinator to discuss patient positioning and to practice with the instructor. The instructor uses the tutors as patients during the demonstration of the lab and then the students are divided into three groups to work in the practice labs with the tutors. As seen during a class observation, the tutors conducted the lab session, provided students with information, and facilitated the practice of the patient positioning. The clinical instructor moved from room to room to offer encouragement, answer questions and support the learning.

The clinical instructor also provides videos of the positioning lectures and examples of good and bad radiographs. Sean, the clinical instructor, noted that he has seen students watching the videos multiple times. He has observed the students watching the videos in groups, stopping the video to discuss the x-ray position and purpose, and then watching the video again to make sure they have understood correctly. Sean stated,

> I can see them in here with their iPads watching the videos and they'll
> pause it and they'll talk about and play it again and go over some more and
> then they'll pause it and kind of break it down. So that's another
> remediation tool that we've implemented for this class. (personal
> communication, February 18, 2014)

In addition to the embedded tutor, the program faculty collaborated with faculty from math and English as well as the Tutorial Center. The CTE faculty met with a basic skills math instructor to get ideas on how to remediate the math sections. An English instructor came into the class a few times to go over the APA style of citing for research papers. In the first year of the grant, the Tutorial Center staff provided training for the program tutors during the regular SI training. The Tutoring Center staff also provided follow-up training in the second semester.

Further, Jeremy discussed extensively the concept of flipping the classroom. He credited his attendance at one of the Consortium Convergence's as the place where he realized that he could change his classroom and put more ownership for learning on the students. Jeremy attended a training on SI and described his "aha moment" this way,

> One thing that she really said that struck home with me, because I can relate to it, she says, 'If you're exhausted at the end of the day from teaching, you're doing it wrong.' And boy, the bell went off because, man, there have been times I've been in class and said, 'Man, I am on, I've got it man, they are listening, I've got it,' and then I'd throw a test and it's like, 'Holy mackerel! They didn't get it.' You know, you think they have it and you're doing the best job you can teaching them but they just don't get it. So it's kind of like, wow. And there have been some days I was just exhausted. They just keep asking the same questions but they're not learning. You're trying to help them, give them the answers and stuff, but they're not learning. So I was like, yeah. She goes, 'It's your job to make the student exhausted at the end of the day, not you.' And I thought, you know what? That just makes so much sense. Why didn't that dawn on me earlier? You know, it's one of those aha moments. It's just like, 'Well, that makes sense. Why haven't I figured that out before?' So I talked to Stephanie and she goes, oh, yeah, and you as well, and with the supplemental instruction. 'Oh, yeah, it's called a flipped classroom.' (personal communication, February 19, 2014)

The flipped classroom in the Radiological Technician program at UCC involves having the students watch the instructors videotaped lectures on the

material prior to coming to class. The lectures are made available to the students on Blackboard, the classroom course management system. In class, the students are divided into groups of five or six depending on how many are in class. They are assigned a section of the chapter to read and present. As a group they have to decide how they will present the material. The students are videotaped while they are presenting and those videos are also posted to Blackboard after class. Students are able to review the instructor's video, their classmates' videos and the book to prepare for exams. In class, the instructor acts as a facilitator or guide for the students. During the classroom observations, the instructor stood at the side of the classroom with his book while students were presenting. He would gently remind students of ideas they forgot and encourage them to push further in their learning.

In addition, both CTE faculty members and the students in the focus group mentioned the availability of the faculty members for students to ask questions and clarify information. This interaction was noticeable during the observations at the college. Sean noted that embedded remediation permeates the program: "During my office hours students are constantly in here asking questions and going over math again. And so it's more of a constant remediation with us throughout the whole entire 22-month program" (personal communication, February 19, 2014).

One additional form of remediation used by UCC is open educational resources (OER). Jeremy indicated that instructors provided links to on line resources for students to access to review math concepts. He described it this way

> Open Educational Resource, OER type thing, where they can go online and they can learn a little bit more about the little areas if they don't really understand what it is, and they can get much more broad understanding on something simple, like, well, this is how algebra fits into this, that type of thing. (personal communication, February 19, 2014)

Professional Learning

The faculty interviews revealed that the Consortium provided a variety of training opportunities for faculty and administrators participating in the TAACCCT grant. The Consortium held at least one Convergence each semester to bring all the participants of the TAACCCT grant together. Jeremy participated in all of these trainings and cited a Convergence as the place where he learned about flipping his classroom. Sean attended some of the Convergences but does not have as flexible a schedule as his teaching partner, Jeremy. However, both instructors thought these meetings were beneficial and helped them understand more about embedding remediation.

Student Learning, Completion and Employment

Both CTE faculty believed the embedded remediation that they have implemented in their classroom has helped to improve student outcomes including student learning, program completion, and employment preparations. However, it is still too early to see the results on employment rates as the first TAACCCT cohort will not graduate until May 2014 and will be taking their licensure test in the summer. Sean discussed the attrition rate with the first TAACCCT cohort and believed that attrition would have been greater without embedded remediation.

> Well, regarding student completion, yes. Like I said before, our second-year group I would guarantee, I've been teaching almost 14 years and I've seen groups like this before where we've lost 10, maybe even 12 students, and I think we've only lost maybe five or six students. So completion-wise, yes, I think it's definitely helped. I think it would have been a larger hit on that class if we didn't have remediation and the T.A.s and the tutors and all that stuff. So I think it definitely should be more successful. (Sean, personal communication, February 19, 2014)

Another example of improved student outcomes was seen in the scores on tests that students took in Jeremy's class: "The retention has been better and the

scores, out of 33 people last semester I had one test that there were 30 As. I've never had that before, ever, ever, ever" (Jeremy, personal communication, February 19, 2014). Jeremy believed that the embedded remediation has had a positive effect: "In a positive way I think that it affected it to where they retain better, and that's always important, because 1 day they're going to go and they're going to take a big national exam (personal communication, February 19, 2014).

Challenges to Embedding Remediation

Sean mentioned curricular changes that must go through the curriculum committee as being a big challenge because of the time required to gain approval for new curriculum: "There's always the curricular challenge, you know, actually pushing through curriculum and changing our courses" (personal communication, February 19, 2014). Jeremy also noted that time is an issue with embedded remediation,

> We only have a certain amount of time, we have a lot of material to cover. And this is with any instructor. They've got chapters 1 through 12 and they've got to get through chapters 1 through 12 in that semester. So any challenges would be bringing in other instructors to teach that embedded remediation and take away time from us. (personal communication, February 19, 2014)

Sean also mentioned that change in general is an issue for both faculty and students. He noted that students in UCC's program must change the way that they learn which is often difficult for them.

> Because students their whole lives are used to sitting in class and having somebody teach them, where all of a sudden the roles have reversed and they actually have to teach. So change is a major issue, too. (Sean, personal communication, February 19, 2014)

Although embedding remediation takes effort, Jeremy noted feeling very supported on his campus and consequently he did not see many challenges.

>That's the amazing thing working at UCC. They are so open to anything. It's, 'Do you want to try that? Great!' They'll give you money for it. 'See how it works out. We'll pay for it.' I've never worked for a place like UCC where they're so behind you trying new things. (Jeremy, personal communication, February 19, 2014)

Recommendations

Both Sean and Jeremy identified collaboration and communication as key factors in embedding remediation and redesigning their program. They highly recommended that any faculty considering a program redesign create an opportunity to talk together. Sean stated, "Talk to faculty members that have actually done it, for one . . . my advice would be just to seek out the faculty members here in the health sciences that are interested in changing and looking for embedded remediation" (personal communication, February, 19, 2014). A review of minutes from TAACCCT grant meetings for UCC indicated that the college held a number of collaborative meetings with faculty from English, math, basic skills and CTE throughout the grant period.

Student Perceptions of Embedded Remediation

The CTE instructor, Jeremy, recruited 10 focus group participants at UCC, and offered five points of extra credit to students who volunteered. On the day of the focus group, the students had a major exam during the hour prior to their lunch break. Students were allowed to take as long as they needed on the test, which delayed the focus group. A replacement room was found and the focus group started at 12:20. However, the room was only available until 1:00 pm so the focus group was completed in less than an hour.

Students stated they chose this career path for a number of reasons, such as receiving advice from parents or other people in their life, wanting to do something in the medical field or wanting to help people and make a good living.

I've always liked helping people but didn't quite know what I wanted to go into and I started seeing I was pretty good at the sciences and stuff and then I actually came to see about the nursing program and they were actually going over all of the Allied Health programs that they have and when this one came up and they presented it something just caught my eye and I thought, well, I can still help people and make a good living and do my part. (Eileen, personal communication, March 5, 2014)

The students were asked to comment on aspects of the program they liked the most and several indicated the learning environment and the teachers. Landon stated, "Honestly, it's the teachers. They've been trying to help us all the way through the classes . . . and it's a constant evolving of the classroom trying to get the best learning environment for us (personal communication, March 5, 2014). Another student, Eileen, said, "I like the way the instructors, pretty much they take the material from the book and they put it in layman's terms for us" (personal communication, March 5, 2014).

Four students verbally acknowledged the course lecture videos and class format as positive aspects of the program. All of the other students nodded their heads in agreement or affirmed what their fellow students said with words such as, "yeah" or "I agree."

I really rely heavily on the video recordings. They record all the lectures, post them online for us to view again at our leisure in case we feel we've missed anything during our note taking, and I know I utilize that all the time. Days don't go by where I'm not watching a video from one of the classes. (Emma, personal communication, March 5, 2014)

The new technique we're learning where we teach ourselves forces me to read the chapter because I don't want to stand in front of the class and look stupid, wherein the past, 'Oh, I don't need to read that chapter today. I can read it at the end of the week.' Well, I'm forced to read it because I want to know what I'm talking about. So I think that's helpful. (Terrie, personal communication, March 5, 2014)

When asked about aspects of the program they liked least, only a few students responded. All three discussed a particular class in the program that is

only 1credit hour, but has a great deal of information that must be learned. Terrie said, "It's only 1unit and it's probably the toughest class we have, so it's discouraging" (personal communication, March 5, 2014). Luci added further detail regarding the problem.

> We have one class that's a 1-unit class but we only get 3 hours out of the whole week to learn and get jam packed with all the knowledge they can possibly give us in that 3 hours and it would be better if it was either split up more throughout the week and take a different class and only do 3 hours of that class once a week or something. (Luci, personal communication, March 5, 2014)

The students were asked about the reading, writing and math components required for the program. Most of the students agreed that the courses include an extensive amount of reading and writing, as well as math. However, one of the students was surprised at the small amount of math required.

> I'm surprised there's not more math, almost, I guess. When I first heard about the program I thought that there would be more math, and math is one of my stronger subjects. I think there's a lot of reading. I read the chapters three, four times before I take a test, so to me it is a lot of reading compared to the math. (Terrie, personal communication, March 5, 2014)

One student indicated that cohort members had created a Facebook page to assist with studying; the page developed into an on-line study group. Emma explained that the second year students had suggested having a Facebook page and a couple of the cohort members took action to implement the idea.

> Landon and Susana started a Facebook that's really been a great help. They started a Facebook page just for this graduating class and we all frequent it and if you have a question you post it to the page and all the peers see it and they'll go on and answer it or help. It's been really helpful. I know that I use that a lot. . . . And then you just get these other minds, you know, it's a different way to look at it and sometimes it makes it easier to understand. (Emma, personal communication, March 5, 2014)

The students also reported that tutors were embedded in their classes and referred to them as "T.A.s" or teaching assistants. Terrie and Luci explained that

the patient positioning class has two tutors and the lecture courses have one tutor. All three tutors are second year students who receive clinical hours for the days they are on campus tutoring students. Seven of the students verbally expressed appreciation for the tutors and shared a positive experience with one or more of the tutors. Students who did not verbally respond to this question were observed nodding their head in agreement as the other students spoke. Luci stated, "I . . . like that we have second-year T.A.s. They really help us in understanding parts that we don't necessarily get. They have a different perspective on it so it helps us out" (personal communication, March 5, 2014). Terrie, stated,

> We get time to interact with them and they tell us what they see in the hospital, what techs don't like in the hospital, different ways to get this position, it's easier. So they have a lot of input from their own personal experience to help us. (personal communication, March 5, 2014)

The students also reported that the tutors were an integral part of the teaching strategy during class time. Eileen said, "They are there during our class time as well and some techs. . . . The instructor will even call on them and say, 'Well, what would you do for this?' and they'll kind of give their input" (personal communication, March 5, 2014).

The students were asked if they had any recommendations for the program to improve their learning or the program itself. Jill offered a suggestion to reconsider the prerequisites: "I think some of the prerequisites for the class could be changed. We have a basic electricity class that could be swapped out for maybe medical terminology. That would be more useful for us" (personal communication, March 5, 2014). Luci thought that a foreign language prerequisite should replace the electricity class, considering the demographics in the college's service area.

> We live in a population of . . . a lot of Spanish and a foreign language isn't a prerequisite, and so it would be very helpful. Because we already go

through in physics with the whole basic electricity thing so you're already going back and relearning it in physics anyway, so if that got swapped out for…either a medical terminology class or a Spanish class that would be way better. (Luci, personal communication, March 5, 2014)

The students were asked if they had anything to add to the discussion before it concluded. Several students mentioned again the positive learning environment and the way the instructors facilitated learning. Landon mentioned the benefit of an "evolving classroom" (personal communication, March 5, 2014) where the instructors are changing the learning environment based on student needs. However, Landon also noticed that waiting until after all student presentations were completed to do a final review left students confused; therefore, he recommended to the instructor that a review be conducted after a few student presentations.

And so what we changed it to, what I suggested . . . is instead of doing a long after-subject-matter review, instead, have a few groups go present their stuff and then have people ask questions on that material at that time. That way it's more fresh in people's memories, they can get notes on it, and then move on to the next subject of that chapter. (Landon, personal communication, March 5, 2014)

Agriculture Community College

Context

ACC is a medium-sized college located in a small agricultural based community in an economically depressed area. According to the college website, ACC is part of a larger district that serves an extensive geographical area. ACC serves just over 10,000 full-time equivalent students at the main campus and satellite centers. A majority of the student population, 62%, is of Hispanic or Latino origin. Other ethnic groups represented are Whites (non-Hispanic) 24%, Asian Pacific Islanders 6%, African Americans (non-Hispanic) persons 3% and all other groups 5%. ACC offers Associate of Arts and Associate of Science degrees

as well as certificates in a variety of career technical education pathways and transfer to a university (ACC web site).

The college's agricultural program is one of its strongest assets and ACC focused implementation of the Consortium initiative in this area. ACC selected the Equipment Service Technician program as one of the CTE pathways to participate in the TAACCCT grant and was the focus of this case study. The actual name of the program has been changed to protect the confidentiality of the college.

Program Description

The Equipment Service Technician program is sponsored and supported by a large company local dealer. This partnership assists in providing state-of-the-art labs and diagnostic equipment patterned after dealer shops. Following industry guidelines, factory-trained instructors provide students with the skills necessary for a job in the equipment industry. Career opportunities are available in construction, agriculture, trucking, mining, waste processing, forestry, marine and industrial engines, and material handling. The majority of the students who enroll in the program are between the ages of 18-24 and predominantly male (98%) (ACC web site).

The Equipment Service Technician program provides two pathways for receiving certification. A student can pursue a 2-year associate degree or a student can enroll in the 1-year certification program only. The 1-year certification program was the focus of the TAACCCT grant at ACC. The college used the Single Structure Strategy to redesign the pathway with a cohort, compressed model that provides students with a short-term career pathway in a high paying vocational field. There are no prerequisites for entry into the 1-year program (ACC web site).

Students who are in the 1-year certificate program attend classes Monday through Friday from 8:00 am until 3:00 pm, and are required to clock in and out just as if they were on a job site. Students attend lectures in the morning and spend their afternoons in the labs working on heavy equipment. The afternoon labs provide students with a simulation of a heavy equipment mechanic shop (Equipment Service Technician Program Review). One of the faculty members, Jon, provided a description of the program during the interview.

> Our cohort is a 1-year program, so it's an intense class. They're with us 5 days a week from 8 [am] until 3 [pm] and then when they're done they get their certificate and they can go out and get a job. What we call our 2-year program, there's only one class available to them so it takes them four semesters, and so we also encourage them, they may be here for 4 semesters, [to] take some G.E., try to get an A.S. degree. And so that's what we refer to as our 2-year program. (Jon, personal communication, March 31, 2014)

Embedded Remediation

The faculty of the Equipment Service Technician program were enthusiastic about the opportunity to redesign their program. Justin, the faculty lead, reported,

> I was lucky enough to be chosen as the faculty lead for the [Consortium] grant, and so through the process of working through how we were going to apply the eight guiding principles [Single Structure Strategy] we were looking at what could we do with our students that would benefit them. (personal communication, March 4, 2014)

Further, both Justin and Jon stated that they have a number of students who struggle with reading, writing and math.

> Gosh, as far as level goes, we're looking at basic sentence structure writing, basic math, some algebra, those types of things. The reading that we do is technical reading, so they're following instructions in a service manual kind of thing. (Justin, personal communication, March 4, 2014)

We deal with students of all various, what do you say, academic abilities. We've had students with a B.S. degree come back to get further education or technical training and we've had students who never graduated high school, so we have all levels. (Jon, personal communication, March 31, 2014)

Jarrod, one of the tutors, went into great detail about the type of reading and writing required in the program.

A lot of reading for instructions as far as there are instructions on repairing, the repair box we get off the computer, printing that out. You've got to be able to read directions, find specs, find torque specs. The list is endless. And then for the writing part what comes into play a lot is for every lab we do we . . . write a service report on it, write our whole repair process. And that can be, it depends on how long your project was because some of our projects take a week-long. Like I said, you need to make sure you're writing down your steps because you have to refer back to those. So writing is important. (Jarrod, personal communication, March 4, 2014)

Justin and Jon both indicated that the primary embedded remediation for the Equipment Service Technician program was the use of embedded tutors. This decision initially presented challenges because the TAACCCT grant redesign included compressing the program so students were done in 2 semesters and the goal was for students to gain employment in the field for which they were trained.

When we first started we didn't have our ETS Scholars as tutors. We had an individual who was an outstanding student and he did all of the tutor sessions. And so in looking back we thought, 'Gosh, it's hard to find another student like that. They don't come along all the time, and so how can we kind of maintain some continuity in that program?' (Justin, personal communication, March 4, 2014)

The faculty members stated they had difficulty at first thinking through a way to sustain the tutors, but after a series of discussions, the program faculty came up with a plan using high performing students.

Well, what we do is we take what we call our ETS Scholars, which are some of our top-end students have been selected by our industry partners to actually sponsor them, and they currently either have taken or are taking the classes they will be tutoring in, and so we use those students as our tutors before school, during lunch, or after school. And the thing that's nice about

it is they're involved in the classes that they're going to be tutoring in and so they are our better students or they have taken the class so they have the experience, they understand what we're talking about during lecture at that time or a general idea of what we're talking about. (Jon, personal communication, March 31, 2014)

Tutoring is mandatory for all participants in the Equipment Service Technician program being served through the TAACCCT grant. Students are required to attend 1 hour of tutoring for every lecture course they are taking. This means that the TAACCCT grant students must attend 2 hours of tutoring each week.

So we essentially just lay it out to them, and, really, with the students that we have they don't know any better, and so we simply say, 'Hey, you're going to do this,' and we get surprisingly little pushback from students. We kind of survey them at the beginning and say, 'What time slot works best for your life?' and then when we get everybody that signs up for lunchtime we say, 'No, no, no, not everybody can do lunchtime, so can you do in the morning? Can you do after school?' We just try to balance it out so that we don't have this huge number of students in there. And we try to keep it loose, too. We let them know that if something happened that morning and you couldn't make it, you know, traffic, you woke up late, life gets in the way kind of thing, just come to another one. And we've got a system in place that tracks the hours that they spend in there so they just simply clock in and clock out and we get a report that shows what they've been doing. (Justin, personal communication, March 4, 2014)

The student outcomes for the first cohort for the TAACCCT grant improved so much the faculty decided to make tutoring mandatory for all students enrolled in any of the Equipment Service Technician classes.

We started this with that Consortium Grant that we got and we implemented it across the board. First it was just for our Consortium students, our cohort students, and then we saw the good that it was doing and so we implemented it across the board and we just don't tell students it's just our grant. We just said for every class you have you owe us an hour of tutoring either before school, during lunch, or after school or class. (Jon, personal communication, March 31, 2014)

Jarrod believed that the tutoring also provides a place for students to work together to help each other out.

> It's a lot better because it's one-on-one, and you only can do so much in labs going over or in lecture going over how to do it and then when you actually sit down and have someone there helping you, I see it really kind of clicks. (Jarrod, personal communication, March 4, 2014)

Another type of tutoring available to students is on-line modules. These modules provide lectures and quizzes that students can go through to hear the technical content another way. "We bought a whole series of on-line learning modules that can reinforce what we're doing in the classroom, so they'll log onto those and be able to go through those" (Justin, personal communication, March 4, 2014). Faculty members reported that they often find students in the computer lab reviewing concepts from class or maybe on a topic they are interested in.

> 'Oh, here's this one on brake systems. Let me check this one out.' And so they're able to go through more than what we just assign them. And one of the benefits in talking to our industry partners with that system is that all of the industries have some kind of online training that they do now and most of their systems, the way you navigate through them, are pretty similar, so it's kind of like we're training our students how to get through that process as well. (Justin, personal communication, March 4, 2014)

Professional Learning

The faculty members did not believe that there had been much formal training regarding embedded remediation. Justin mentioned the Consortium Convergences and other meetings as one form of professional learning, "There were some basic skills discussions at those, there were some workshops that were offered, and so we picked up little pieces of it through that, but formally not really much" (personal communication, March 4, 2014). Jon stated, "I think we all come from high school [teaching], all three of us, and so whatever basic skills and

strategies that we learned in high school for high school teaching we carried with us" (personal communication, March 31, 2014).

Some training was offered for the tutors. Jarrod reported that, "We went through a training course through the [SI program]. . . . and they give many different strategies" (personal communication, March 4, 2014). Jarrod went on to describe the training:

> It was last semester. It was about 2 hours as far as we sat down with the lady in charge . . . but she sat down with all of us tutors, and I still have the packet she referred to and it listed probably I think 20 or so different strategies, a lot of different things, things that we could use and always keep with us, think of it as something we need to refer to help us out. But it was slide shows and a video and we had, I just don't know the exact names of the learning center of what it was. We had to go on the computer and take a test off the computer for everything, answer questions and stuff. (personal communication, March 4, 2014)

Student Learning, Completion and Employment

Justin believed that the redesigned Equipment Service Technician certificate can be credited with improved completion rates and employability.

> Yeah. We saw phenomenal results, and I think you mentioned looking at some of that data already, but we saw a whole grade increase in students from all of the changes that we made within the program, and so it's been incredibly helpful to the students. That just kind of forced them to do some more stuff. But, yeah. And I think the end result is we had, I think, three or four students that were not at the end gainfully employed through the process, and so when you take a group of about 40 students and you see that you've got 37 of them that are working, making more money than they were before, contributing to society, that kind of thing, it really kind of hammers it in that, wow, these things are really working. (Justin, personal communication, March 4, 2014)

Jon echoed Justin's perspective, although he thought the first year might be unusual since the current cohort of students have similar retention rates as student groups prior to implementing the tutoring.

Our grades improved probably by a whole letter grade on average. Completion rate was pretty close to 100%, high 90s, and even employability, we got most everyone employed. . . . We have had hardly students drop out of the last cohort [first Consortium cohort]. This cohort I think we've lost four or five. It's [this year's Consortium cohort of students] more average compared to what it's been [in the first Consortium cohort of students]. I don't know if last year was just an anomaly but it seems like even now our grades are a little bit higher. I think it has to do with everything, the remediation even within the other classes, not the cohort [Consortium] classes. You tend to see that their grades are a little bit higher. I guess I think it just gives them time. They've got to be here so while they're here they might as well do some work, so it gives them an opportunity, a place. (Jon, personal communication, March 31, 2014)

Jarrod believed that having tutors is beneficial for the students.

I think it helps out because we go through things at a fast pace and there are a lot of things that we have to jot down and everything, so with us being in the shop there or in the classroom there, not during class, then we can get the most questions. If there are any other things we're there for students to fall back on and ask more questions and kind of clear things up. (Jarrod, personal communication, March 4, 2014)

Challenges to Embedding Remediation

Both Justin and Jon stated that implementing the embedded tutoring was one of the biggest challenges to the program. The college had a model for embedded remediation based on the national SI model, but that model would not work for the CTE program.

I think early on with the embedded tutor it was a little bit difficult trying to break out of the large-group instruction mold, and that program was really based around that kind of a process, and so some of the things that they were saying, 'Oh, this is what we're going to do,' didn't really apply to what we wanted our guys to do as far as studying goes, and so it was a little bit working through that to try and figure out what works for us and what doesn't. And the staff were great with it and sometimes we would just simply say, 'Okay, what's going on? What can we do to work through this process?' So that was a little bit difficult just trying to work the kinks out. It's a new system so you're always going to run into those types of things. That's probably one of the major ones. (Justin, personal communication, March 4, 2014)

Jon noted a challenge regarding different views of who the tutors should be:

> The biggest challenge was really trying to get everyone on board that we could find our tutors to work out here, because it seemed like when we first started, if I remember correctly, they wanted us to use tutors from the Tutoring Center, which I understand, but they wouldn't understand the concepts we're trying to get across to our students, and so we actually had our students here that we selected for our tutors to go to the Tutoring Center to get training. (personal communication, March 31, 2014)

Recommendations

The CTE faculty members and the tutor were asked about any recommendations they would make to colleges considering redesigning CTE programs with embedded remediation. Justin believed that one of the first things a college should do prior to embedding remediation is to have numerous conversations with all interested stakeholders.

> I would definitely say that you probably need to get everyone involved at the same table at the same time and spend some time talking about what your plans are and what everybody's role in the process is and try to figure out what works the best for everybody. (Justin, personal communication, March 4, 2014)

Justin believed that having these conversations early on would help a new program succeed and assist with sustainability once grant funds are expended.

> I think one of the lessons we learned was that in a program like ours that's so short, sometimes that great tutor that you had one year is not going to be back a second year and so it can be difficult to find people that are that caliber that are going to step in and be able to do that when they're learning it themselves at the same time. So sustainability once the grant is gone was really important to us. Like, okay, so we're paying for a tutor out of the grant right now but when that money dries up, then what? Do we scrap this thing or do we try and keep it going? You know, our goal has always been if we make a change, it's worth it, and how do we continue to do that. (Justin, personal communication, March 4, 2014)

Jon recommended that any changes a college makes should become part of the culture. He believed that if students and faculty members know what is expected of them from the beginning then change will be easier.

> Well, the embedded tutoring, the biggest thing is make it a culture. This is what's expected. Even now as students come in, prospective students, we tell them that part of the program is 1 hour a week per class, and so it just becomes the culture. Everyone expects it. At first I don't know [if] when they hear it that they kind of second guess it, but I think after a few weeks into it they don't really notice it being an issue for them. I think most of them end up coming and I think they find out it's a nice place to get some work done. (Jon, personal communication, March 31, 2014)

Jarrod stated that hiring of the tutors was extremely important and recommended that colleges conduct interviews to get the right person.

> I just think who you choose is really important, because there's people that don't want to put in extra time, they kind of just want to get through things, and there's people that don't mind taking on this extra role. It's extra, and we're getting rewarded for it also at the same time. But I like how they went through the interview process and everything. (Jarrod, personal communication, March 4, 2014)

Student Perceptions

At ACC, eight focus group participants were selected by the faculty to participate based on grades. The focus group met in one of the classrooms in the warehouse, and pizza and sodas were provided for the students as the focus group took place during their lunch break. The students were very cordial and helpful. This was evidenced by students volunteering to bring the pizza and sodas in, moving chairs around to accommodate everyone around one table, and setting out the paper plates and napkins.

The students had as many reasons for participating in this career pathway as there were students in the group. Geno said, "I'm better at this than just regular general ed, so that's why I'm here" (personal communication, March 4, 2014).

Jesse described his choice this way, "I've always been very mechanically inclined so I chose this kind of like not really the easy way but it's always something I've always really enjoyed" (personal communication, March 4, 2014).

Students were asked to comment on aspects of the program they liked the most and many cited the hands-on practice they receive. The discussion elicited responses such as this one from Juan, "I like this program way better because we're half in class and half into the truck and make sure you're doing stuff hands on with machinery" (personal communication, March 4, 2014). When asked about things they liked least about the program, the students identified groups of people who did not seem serious about learning; "The slackers, that just show up and they don't want to pay attention" (David, personal communication, March 4, 2014). The students also identified class sizes as a problem.

> Having 40 people in the same class sometimes can, like I said, restrict other people from learning just because there are certain tasks that we do that maybe only two people should be on that task rather than four or five in some cases. (Ryan, personal communication, March 4, 2014)

Another student highlighted the logistics problem of having too many students and too few pieces of equipment:

> You have 40 people in the classroom but we only have so much equipment for these 40 people, so you have to team up in groups, and the drawback with that is in reality there's only going to be one person on each piece of equipment. (David, personal communication, March 4, 2014)

Participants were asked about the reading, writing and math components required for the program. The students stated that there is an extensive amount of reading and writing in the form of technical books and reports and writing reports on the repair of engines.

> They do assign us homework where we do have to read a chapter and take a test after we read the chapter. We also have to do a lot of reading. Especially with safety and welding class, we have to read and then we'll have a test. So there is a lot of reading. There is a lot of write-up and stuff

because a lot of our tests and quizzes are not all multiple choice. We do
have to write them out and stuff. (Roberto, personal communication, March
4, 2014)

The students indicated that there is also a significant amount of math in the

curriculum. Each course in the program has its own math requirement.

There's a lot of math in that because you have to figure, well, in electrical
you have to figure out how much resistance or how much voltage you're
getting or how much amperage and you have to do your Ohm's law. And
then hydraulics, it's how much force is needed and how much pressure it
takes to lift that force and how much air. So there is a ton of math in this
field. (Roberto, personal communication, March 3, 2014)

Participants were not aware of any specific remediation of math or English by an

outside instructor in the classroom. Students credited the instructors for being

helpful. Josh stated, "They try to help us with things . . . try to make things easier

to remember, give us little acronyms . . . instead of just trying to memorize all this

information and they try to make it simpler to remember (personal

communication, March 4, 2011). Instructors were observed offering students

helpful hints during the classroom observation. The students and instructors

appeared to have a relaxed relationship when observed in the classroom. Students

respectfully interrupted the instructor to have information clarified or pose

questions and provided comments or shared their own experiences with the class

regarding the topic of discussion. Two focus group students, David and Chris,

shared examples of what instructors do that helps them learn.

Repetition. They just pound it into you until you get it right. I mean, we
get worksheets that we have to do and then we get quizzes after that.
Worksheet, quizzes, worksheet, quizzes. And if you're still not getting it
they give you one-on-one attention and go through the steps so that you do
get it. (David, personal communication, March 4, 2014)

We noticed, too, this year [second semester], when you take quizzes and
what not the instructor will immediately go over the quizzes because he'll
have the class grade them, they'll go over them, and depending on the

scores is what determines if we move on to the next subject. (Chris, personal communication, March 4, 2014)

Students were aware of the tutoring offered by the program but believed it was not beneficial. David said, "They do assign a study guide [tutor] that has passed the class that has gone through the course, and he's supposed to be here, but some of us might know more than him" (personal communication, March 4, 2014). The students believed the required study hall, their term for tutoring, was more important than having a tutor.

> Usually the people that go to the study hall is the people sitting right here, so we'll help each other out. We'll go, 'Oh, what did you get for this question?' And we'll have like a little argument and like, 'Oh, well, why did you come to that answer? Why did you get that answer?' (Chris, personal communication, March 4, 2014)

The participants had an understanding of the role and purpose of the tutors. Chris explained, "What it is they're in the ETS Scholar program. It's supposed to be the 2-year students so they're supposed to be kind of the cream of the crop" (personal communication, March 4, 2014). The students expressed frustration with the tutoring and stated there had been no tutor thus far during the second semester. Chris stated, "So it was kind of useless having those guys in here the first semester. The second semester nobody is here" (personal communication, March 4, 2014).

Additional tutoring is provided on-line through an industry proprietary program. Eduardo stated, "They [the faculty] kind of push us into doing that [on-line tutoring] because they [the faculty] say that there may be something that they [on-line tutoring] can cover and just by listening to it differently then we may be able to just get it into us" (personal communication, March 4, 2014).

The students seemed to be aware they were in a special program that had been redesigned.

We're getting more actually out of this program than the 2-year [students] because I was talking to some of the guys and they're not even doing the OSHA 10 and some stuff like that. We're getting certifications they're not getting. So we're actually doing more than them in some sense in less time. (Josh, personal communication, March 4, 2014)

Students had specific recommendations regarding tutors for the program. Josh suggested, "For the selection of tutors, definitely pick someone that would be worth the time to have here, not someone that's just kind of getting some credits" (personal communication, March 4, 2014). Geno provided an additional criterion, "I think they [tutors] should at least have some mechanical background or at least took shop classes in high school" (personal communication, March 4, 2014).

Chris also recommended emphasizing the Consortium cohort program as an advanced program and proficiency tests should be included as part of the admission screening process. While Chris spoke several in the group agreed by nodding their head, interjecting, "Oh Yeah" or "Yes, that's true."

I think they should emphasize this more that, look, this is an advanced class. If you're not proficient in all these things you shouldn't even enroll in this class, and then right off the bat, when you take those proficiency tests, if you can't score proficient soon enough you should automatically be placed in the 2-year program. You shouldn't even be allowed in the advanced class. Because this is a ten-month class and you have to be paying attention to do what they want you to do. That's all it comes down to. You can't be slacking off. If you think you're just going to get out of here with a C you might as well not even have took this class. What's the point? (Chris, personal communication, March 4, 2014)

Suburban Community College

Context

Suburban Community College (SCC) is a large suburban college with a large geographical service area and enrolls approximately 25,000 students per year. According to the college's web site, over 75% of the students are below the age of 30 and 80% need more than one remedial course in reading, writing or math

upon enrollment. The racial/ethnic make-up of the college is diverse with the largest ethnic group (38.4%) being persons of Hispanic or Latino origin, followed by White persons (not Hispanic) 25.3%, Asian persons 14.5%, and African Americans (non-Hispanic) persons 10.6%, with the remaining groups at roughly 6%. The college trails state and national averages on educational attainment levels for the age 25 and older population group.

The College offers pathways for obtaining associate degrees, transferring to a 4-year institution and obtaining career technical education. The Health Science Division at SCC offers a variety of health care related degrees and certificates such as Registered Nurse, a 2-year program; Psychiatric Technician, a 1-year program; and Certified Nursing Assistant, a 7-week program. For the Consortium initiative, the college selected their Psychiatric Technician program for redesign.

Program Description

The Psychiatric Technician program at SCC was re-established in 2001 after having been closed for several years. Steve, the SCC lead Psychiatric Technician, has been teaching in the program since it was re-established. Admission to the program has four prerequisites (Anatomy, Medical Terminology, Human Development and Introduction to Psychology). The program is a 1-year intense nursing program that requires more than 60 hours per week of lecture, clinical rotations and assignments. Three rotations are required for all students: developmental disabilities, pharmacology and psychiatric disorders. Students who successfully complete the program receive a certificate of completion and are prepared to take the state licensure examination to become a Licensed Psychiatric Technician in the state of California. According to Steve, many of the students struggle with the basics of reading, writing and math while in the program: "They can't write complete sentences. They're either fragments or they're run-ons or

real basic English type stuff. Punctuation" (personal communication, April 1, 2014).

Embedded Remediation

The faculty and staff at SCC have implemented a variety of methods to embed remediation into the program. Both faculty members interviewed cited the use of the tutor as the primary method of remediation. The tutors are former completers of the Psychiatric Technician program and return to assist students in the current cohort. The current English faculty member, Jean, is an adjunct at SCC and did not join the TAACCCT grant until halfway through the second year of the 3-year grant period. She reported that initially she met one-on-one with the students to work on remediation issues. Jean described her role in the beginning:

> My role is to create curriculum that's contextualized and I'm also responsible to collect and interact with the students with this piece of the program, so in that sense for the most part it's been outside of classroom instruction. So when I first came on board, which was not at the beginning of the grant, I had time, actually, to meet with the first cohort, and I think I met for 12 weeks face to face, so at that point it actually was a separate class for all intents and purposes. (personal communication, March 11, 2014)

Jean went on to say that once the second cohort was admitted to the program, it became impossible to meet with the students face-to-face. The number of students grew to 120, which made continuing in the way she had been conducting remediation unmanageable. Remediation was then moved into an on-line class so that students could access the work through the campus Etudes on-line class management system. This change proved to have some inherent challenges since the remediation was not really a course; therefore, at the time of the interview, the English instructor provided each student with a customized packet of materials to assist them in the area of remediation.

Jean reported that, "[in] this most recent packet I included some case studies that involved writing, reflection" (personal communication, March 11, 2014). She indicated that she tries to contextualize the material to match whichever track or rotation the student is currently on (developmental disabilities, pharmacology or psychiatric disorders). She includes case studies, research assignments, literature reviews, correct APA citation and other instructional components in her lessons. When students are in the last 6 weeks of the program, she focuses on soft skills related to employment such as interview skills, resume writing, and cover letters.

Steve has been with the TAACCCT grant since its inception. He discussed embedded remediation and noted that there is not enough communication between him and the basic skills faculty regarding implementation. He noted that in his classes he regularly checks for understanding through the use of daily quizzes. This helps him to see if students are on track and where they need assistance; he viewed this practice as one form of remediation.

> One thing I have is day-to-day assessment of where they're doing, how they're doing. And for students who can't make it, that way I can identify them early. . . . I do that because otherwise, seriously, they would just not read, and that's kind of the situation now. (Steve, personal communication, April 1, 2014)

Steve also stated that the clinical rotations are another place where embedded remediation takes place. In these rotations students have to write care plans and respond to case studies. The students receive detailed feedback on their writing in order to improve their written communication skills.

> I just had lunch with one of the clinical instructors yesterday and she was telling me exactly where their deficiencies were in their care plans, in their documentation and all that, and she's known for, you know, she'll mark the whole thing up in red because she'll make them, she will force them to do it her way or the highway type thing. I mean, she's real rigid about that. So I know they're getting remediation from her. And that's part of it. They do

more of that in the clinical than we do [in the content classes]. (Steve, personal communication, April 1, 2014)

The tutor provides one-on-one tutoring for any issue the student is struggling with. Any faculty member can refer a student to tutoring, or the students can make appointments for themselves. Steve related a story about two students who were failing his class based on his daily quizzes. Steve referred them to the tutor and, "There's been a just remarkable difference in their abilities and the only difference was tutoring" (personal communication, April 1, 2014).

Another type of tutoring that is available to the students is through a Student Success class that is offered at the beginning of the program through the Nursing Success Office. The college faculty use a series of books used as study guides that are designed for nursing students to assist them in being successful in the program. The two sessions helped the students understand the licensure exam and how to study throughout the program. The class took place on two Saturdays prior to the start of the initial semester of the program and was not required.

The students are referred back to the Nursing Success Office when it is time to prepare for the state exam; they use the student success books to aid in the student's preparation for the exam. Steve stated the use of study books has shown to be successful for some students who have not passed the exam on their first try, and he gave the example of a student who was helped this way when trying to pass the state exam for the third time.

And I had given her a Psychiatric Nursing, it's the test success series, but this was specifically in Psych Nursing, and, seriously, that was the best thing. That was like my good news for the month was the fact that someone who had English as a second language was able to pass the state board. (Steve, personal communication, April 1, 2014)

Rebecca, the tutor, stated that she is unfamiliar with the term embedded remediation. She described the tutoring services as individual tutoring by

appointment only for students in the Psychiatric Program. She stated that group study was provided in the past, but not currently. She further explained that sometimes students bring one or two others with them to work on the same issue, but that large group study sessions for more than two or three are not offered.

> If they want a group we kind of keep it small, but we usually stick to small groups. If they want to bring in a friend then they bring in a friend. But some people I do suggest one-on-one because I find it better for certain students to have one-on-one because they get a tad distracted sometimes. (Rebecca, personal communication, April 1, 2014)

Steve said the faculty discovered that the large group study sessions appeared to be more like lectures and so the faculty asked the tutors to focus more on individual assistance.

An important factor at SCC was that tutoring is student- driven. The tutor does not have set hours, but makes arrangements to meet students based on the students' availability. Rebecca stated that she does not attend the lectures or spend much time with the faculty. If she has questions or wants to know what topic they are covering, she contacts the instructor to get that information.

> I have before, [contacted the instructors] especially with instructors that I didn't have lecture with, but with those that have been here I usually don't. But when it's a completely different instructor I have gone and sat in on their lectures to see what they're doing and to see the professor's way of doing things. (Rebecca, personal communication, April 1, 2014)

Professional Learning

The English faculty member at SCC indicated that she had participated in a number of trainings and meetings provided by the Consortium. The Consortium had hosted a Convergence at least once per semester and the Convergence agendas indicated that several meetings were focused on basic skills and remediation. However, most of these sessions were prior to the English faculty member joining the grant.

Steve also mentioned the Convergence events as a place that he had received some training and awareness of embedded remediation. He also described a type of embedded remediation that he experienced while getting his Psychiatric Technician license many years ago. He reported that his instructor took time at the beginning of each class to focus on one technical area of writing. Steve said, "I didn't know it was remediation at the time, but [the instruction was] in basic English, sentence construction, [and] grammar" (personal communication, April 1, 2014). In looking back, Steve realized that his instructor's approach was a useful tool, and he brought this idea to his colleagues at SCC as a possible way to embed remediation.

> So that was what I told the dean, and Jean and [Name] when she was more a part of this. I told them I'd saved some exercises that I'd found that combined Nursing content with sentence, like English approach to composition. I thought that would be most effective. (Steve, personal communication, April 1, 2014)

Rebecca stated that she participated in an orientation session and then watched videos that showed ways to conduct effective tutoring sessions. She had not received any training since the initial orientation. She also reported that a previous tutor, who had been there awhile, gave her pointers on how to conduct a tutoring session. In addition, she chose to attend an APA workshop offered on campus so that she could be more effective in working with students who were writing papers.

Student Learning, Completion and Employment

Steve believed that the focused tutoring and other pieces of the overall program have contributed to increased success on the state licensure exam. The first TAACCCT grant cohort had an 87% passing rate, which is a 10% increase from the previous year and a 7% increase from 2 years ago (California Board of

Vocational Nursing and Psychiatric Technicians, 2014). The CTE faculty member also believed that tutoring had been helpful and that it became more formal as a result of this grant.

Jean, the English faculty member, believed that the interventions she did when she first came into the grant were more effective than what is being done currently. Previously, she had more face-to-face time with the students, but now feels disconnected from them. Jean thought the students perceived the packets as, "an extra bureaucratic thing" (personal communication, March 11, 2014) and she realized this is not the intent of embedded remediation. Jean stated, "It really should be so integrated in that it just becomes part of their experience without them perceiving that they have to . . . do an additional 2 hours of work beyond that." (personal communication, March 11, 2014).

Rebecca believed that the tutoring has helped students. She had heard students say that the tutoring helped them get a better grade. She said that sometimes they complained that tutoring did not help them, but overall she believed that students appreciate the availability of a tutor and many of them make appointments to see her.

> Well, I do have a lot of students coming in that come in often and I do hear like, well, it's not always positive. Sometimes its like, 'Oh, I still didn't get the grade I wanted,' but then there's a lot of the time where like, 'Oh, it really helped, what we went over.' I always get positive feedback. (Rebecca, personal communication, April 1 2014)

Challenges to Embedding Remediation

Steve stated that one of the biggest challenges in embedding remediation for their program is simply time. There is not enough time to embed additional learning when so much technical material must already be covered in a short amount of time. Steve explained, "The hardest part has been trying to condense the

content. It's really been more of a curriculum problem, getting everything done in a slightly shortened period of time" (personal communication, April 1, 2014). He also indicated that communicating with everyone involved was a challenge. Part of that struggle was also time related, as it is difficult for the program instructors to meet due to their teaching schedules and the basic skills faculty member is an adjunct. Steve said, "Jean is adjunct, so it's very hard to communicate with someone who's not on the campus all the time" (personal communication, April 1, 2014). This communication challenge made program planning difficult.

Another challenge for the CTE faculty was finding tutors. The goal of a CTE certificate program is for students to finish the program and get their licensure as soon as possible. This goal reduces the feasibility of using former students as tutors.

Jean also viewed lack of time to be a challenge, and she thought that greater collaboration and communication would be helpful to the program, particularly in the area of embedded remediation. Jean stated, "I haven't really had time to meet very much with the CTE faculty lead because of his schedule, not because he wouldn't want to" (personal communication, March 11, 2014). The CTE faculty members are tied to their teaching schedules, and with block scheduling, compressed time frames, and implementation of essentials in the Single Structure Strategy, it is difficult to be away from class. Jean viewed this lack of communication and collaboration as a major obstacle to embedding remediation.

Recommendations

All of the SCC participants recommended greater communication and collaboration as a way to improve the embedding processes that have been started. They each cited lack of collaboration as a challenge and recommended that the program find a way for all instructional staff to meet together and map out what

needs to be done. Jean recommended that colleges provide an opportunity for CTE faculty and remedial faculty to meet together regularly to effectively embed remediation into the classroom. The faculty members stated collaboration as their number one recommendation to any other colleges that might consider embedding remediation in CTE programs.

Rebecca said that having a designated, structured office has been key to effective tutoring. She recommended that there continue to be a highly coordinated effort to keep the scheduling, implementation and follow-up of tutoring in one physical location.

> Oh, this office is wonderful. [Name], who's our coordinator, and then we have [several others who] all work in this office and they help out with scheduling, getting the word out, they'll e-mail the students like I'm available this week and so forth. I really enjoy being in this office. (Rebecca, personal communication, April 1, 2014)

Student Perceptions

Focus group participants volunteered to participate during their lunch hour, and were provided with pizza and bottled water. The focus group took place in a room across campus from the classroom. The students were helpful in carrying pizzas and water and finding the room; they seemed excited to be participating. Once everyone had food and found a seat, the researcher started the focus group. There were 10 student participants.

The students cited a number of reasons for entering the Psychiatric Technician program including a career change, opportunity to make a good salary, and short duration of the program. Mike explained, "I was changing careers and I have been interested in psychology, but I hadn't really gone and studied it. So hearing about the expanded program, they had opened it up for twice the number

of students" personal communication, March 11, 2014). Brenda discussed the

short length of the program as an incentive for her:

> I heard it was just a year program so it was fast and that's something. I already took the prerequisites for RN, too, so it kind of fell in with the same prereqs and I heard you'll make good money. (personal communication, March 11, 2014)

Students were asked to comment on aspects of the program they liked most

and a number of students identified the cohort model as a highlight of the

program. Robert stated, "It's the whole sharing the same struggles, sharing the

same experience. It's like going through different experiences that you wouldn't

really go through with other people" (personal communication, March 11, 2014).

Lynne and Vicki also expressed appreciation for the cohort.

> I really love how close we all got. It's a year program but we're in it together. Every single day we're all together and it's like in a short period of time you've got to rely on these people when you're in our clinical sites. Like who can you work with and who can you study with. And it's hard. How would you say that? It's just in a short period of time you wouldn't think that you would meet all these people and get very close. I like the field that we're getting into but also just the people we've met makes the experience worthwhile. (Lynne, personal communication, March 11, 2014)

> I agree with Lynne. I love my classmates. This is what makes me really get up in the morning and want to come and just sit in class for 8 hours a day. The people that I sit with really makes the experience for me. (Vicki, personal communication, March 11, 2014)

The students also expressed that the teachers are one of the aspects of the

program that make an intense 1-year nursing program work. Laura said, "I like the

instructors, too. They're very nice. They're passionate about their knowledge. I

like that" (personal communication, March 11, 2014). Lynne added,

> The [campus] instructors are so easy to approach. They're not intimidating and they're really welcoming. If you really need help they will help you. Sometimes we call them at home. We'll like text them. We'll say we need help with our clinical or whatever and they will take the time and help us. (personal communication, March 11, 2014)

The participants also were asked to describe any aspects of the program that they disliked. Only two students responded to this question. They expressed frustration with what they perceived as a lack of communication between the teaching faculty on the college campus and the clinical instructors out in the field.

> So some of the instructors aren't as, it's actually more the clinical instructors, they're not as passionate about it, so it's kind of weird when you go into clinical and they're just kind of like, 'Uh, go do your thing.' So that's the only thing that really bothers me. But other than that, I can't really think of any other thing that bothers me. (Robert, personal communication, March 11, 2013)

> We've had a couple instructors who are brand new so they don't really know what they're supposed to be doing or what's expected of us as students or what's expected of them as instructors. . . . It's really frustrating because we're students, we're not the instructors, and it shouldn't be on us to tell you what you're supposed to do. (Vicki, personal communication, March 11, 2014)

The students were asked to describe the requirements for reading and writing in the program. This request elicited laughter and a response of, "Oh yeah!" from all the participants simultaneously. Several students described the types of reading and writing assignments required. The reading seemed to focus on the textbook and the writing included care plan, patient charts, case studies, and research papers.

> [We have to document] what we did and what we've seen and our observations on the patient and what we did for them. And all that's a legal document so it's very important to get it correct and make sure you know how to spell and write and not be illiterate. (Brenda, personal communication, March 11, 2014)

> We have to write research papers and case study papers, APA format, so that's a crucial part. In each of our rotations we do one of those. And then as far as reading, we're reading the textbook, and our case studies we do on a daily basis or a weekly basis. Care plans and charts. (Joy, personal communication, March 11, 2014)

Students were asked to describe math requirements of the program. The students indicated that math, especially dimensional analysis, is a part of the program's three Pharmacology courses.

> Yeah, we do that in Pharm. One instructor came in handy. She kept giving us problems, problems, then she would work it. Like we would do it on our own and then she would work it and show us step by step, and, I don't know, I got it. Not at first, but after a while. It was good. She just kept going, patience, to teach us and have us do it on the board and she just kept doing it until a lot of us got it. (Karen, personal communication, March 11, 2014)

The participants were asked about any remediation in reading, writing, or math that is provided throughout the program. A few students mentioned a study skills course that was offered at the beginning of the program on two Saturdays. Laura said, "[The course covered] English skills, and she taught us skills to help to read and make notes and study" (personal communication, March 11, 2014).

The students also described three other types of remediation that the program offers. One type was described as a "basic skills component." Vicki explained, "We get packets now. It was on-line but we have to, it's like a 2-hour thing we're supposed to do every Tuesday, and it's really annoying" (personal communication, March 11, 2014). Several students expressed a negative perception of this component and Joy summed up everyone's thoughts.

> I think what they're trying to say is it's kind of extra stuff put on knowledge that we already know how to get there and do, that it's not correlating with what we're actually doing at that apparent time, I guess. Does that make any sense? . . . I mean, we do know how to use that [APA] at this point. If at the beginning and that's all you do at the very beginning when the cohorts start and give them a teaching on how to maybe do APA format and this is how you use the database for research, then that's good, but kind of sticking it to us again it's like, you know, then we get frustrated and it's like, 'Oh, why do I have to do this again?' (Joy, personal communication, March 11, 2014)

The second type of remediation that students referenced was tutoring. The students explained that they had two tutors who were graduates of the previous cohort. The tutors work out of the Nursing Success Center and have pre-set hours as well as appointment times. Vicki said, "You can walk in or you can actually call them, and they do private tutoring too" (personal communication, March 11, 2014). Lynne described the type of work that was done by the tutors:

> They teach us whatever subject that we need help on, and if we have a test they help us go over the topics we need to know, and with the Pharmacology we have homework or we go over those worksheets together. (personal communication, March 11, 2014)

Most of the students in the focus group indicated that tutoring was beneficial; however, a few students stated that it was not helpful to them personally. Laura said, "Sometimes they have the same questions that we have" (personal communication, March 11, 2014). Karen remarked that she attended tutoring in the beginning but did not find it beneficial: "Yeah, I did it at the beginning. . . . But it really wasn't beneficial for me. I did better off on my own, you know, for me" (personal communication, March 11, 2014). Laura responded by saying, "I think it depends how you learn, because for me, like hearing and repetition about the things helps me, but I guess it's different for everybody" (personal communication, March 11, 2014).

One last type of remediation that students discussed was their instructors' helpfulness. Students indicated that the teaching faculty were very helpful and encouraged students to contact them. Faculty gave students their phone numbers; this evidenced a high level of commitment to providing assistance.

> Yeah, it's really cool that all the instructors give us their personal cell phone numbers, so they give us the option to text them if we do have questions and usually they'll try to respond back to us whenever they can. I mean, it's nice that they give us that flexibility. (Robert, personal communication, March 11, 2014)

Another student indicated that contacting the teachers was her primary means of remediation.

> I just utilized a lot of the teachers. I would bug them. So just the instructors. Like I said, there are really a few out there that really go over and beyond and you can call them and text them and they take that extra, and I think they pay attention if we're getting it or not. They don't just keep going so fast that you don't get it. They're going to make sure the majority of the class gets it before we move on. And with the math I do remember we did that. (Karen, personal communication, March 11, 2014)

The students made several specific recommendations to improve the program. The first recommendation regarded the tutors. A few students recommended that the tutors be more prepared for tutoring sessions, especially group sessions. Lynne commented, "I went to tutoring for a little bit and I realized that everyone had different questions and sometimes it did get confusing because there was no structure to what we were going over" (personal communication, March 11, 2014). Vicki offered similar advice:

> Actually hire tutors that have taken their boards or they're actually working, that they actually know what they're supposed to be tutoring on. Have them come with a plan. 'I'm going to tutor for Pharm today. We're going to go over these meds. We're going to go over psych meds today, these, these, and these, and this is what we're going to talk about.' That way we don't get like a million people in tutoring asking questions about Med-Surg or DD when we're supposed to be focusing on Pharm. . . . That's frustrating. (personal communication, March 11, 2014)

The second recommendation was regarding the communication and expectations between the instructional piece of the program and the clinical rounds. Almost half of the students stated that there was a great deal of confusion regarding processes and procedures that were taught in the instructional program versus what the clinical instructors wanted done at the clinical sites. Robert described the issue of varying expectations from instructors.

> I mean, the same thing with nursing diagnosis. It did take me a while to actually understand it because you had one instructor say one thing and

then when you move on to a different instructor it kind of contradicted with what the other one said. So I guess for the nursing diagnosis they wanted us to use 'nursing diagnosis related to,' and then at that 'related to' part some of them wanted, 'Oh, hey, you could use like pathophysiology of a medical diagnosis,' and then some instructors didn't want that. (Robert, personal communication, March 11, 2014)

A third recommendation, made by Vicki, was to rethink the additional basic skills packets that students had to complete each week. Throughout the focus group students expressed frustration at being forced to do something they perceived as an "add on" to their already full schedule.

I would get rid of that whole packet online. I'd get rid of that because it's a waste of time. We have enough on our plates than have to go home and look on Delta's database and look up a thing and write a paragraph. I don't have time for that. I have kids. I don't have time for that. (Vicki, personal communication, March 11, 2014)

Cross-Case Analysis

This section begins with background information on the Consortium grant requirements for embedded remediation, and then provides a cross-case analysis of institutional contexts and themes that emerged from the three case study colleges. Embedded remediation had several component parts such as planning, embedded tutoring, and faculty and tutor training. Similarities and differences in format, processes and challenges in the implementation of embedded remediation will be discussed. Also, a comparison of recommendations from the colleges will be presented.

Consortium Grant Requirements

Embedded remediation was not defined in the Consortium grant proposal's scope of work; this was left for the colleges to determine. At the time the grant was written in 2011, the Consortium adopted Complete College America's (2011) eight guiding principles as a Single Structure Strategy, which includes embedded remediation as one component. Complete College America (2011) did not provide

strategies or give a list of best practices for embedded remediation. The primary premise was that embedded remediation should take place within the program simultaneously with skill competencies.

> Most remediation should be embedded into the program curriculum, supplemented as necessary through instruction that is parallel and simultaneous to the program, rather than preceding it. Students should develop stronger math and English skills as they build program competencies, using the program as context, and there should be clear basic skills outcome expectations with rigorous assessment. (Consortium grant proposal)

The grant project provided for a Basic Skills Redesign Team Lead. This person was tasked to work with all the colleges to define embedded remediation and lead the colleges in developing parallel interventions throughout the consortium. However, this person moved out of the area a few months into the planning phase of the grant, and the lead college did not designate another Basic Skills Redesign Team Lead for 9 months (Consortium meeting minutes). This void left the colleges with the task of developing practices that could easily be implemented in a short timeframe. For example, the three case study colleges adopted tutoring as the primary practice to embed remediation in each career pathway, but the level of implementation within the elements of embedded tutoring differed among the three colleges.

Context

The context of a college plays an important role in the development of its career and technical education programs. Further, the context often dictates the culture of the institution, as community colleges are oriented toward the specific communities they serve. The case institutions were chosen with this understanding in mind. Each college represents a different type of community, size and population; yet, there are significant similarities.

Similarities. The overall mission of the three institutions is similar. They are all community colleges within the state of California. They all offer associate degrees, transfer to a university and Career Technical Education. Each program was created to assist students in completing the knowledge necessary to meet industry standards and prepare students to pass a state or national licensure exam or both. The colleges studied were also members of a 10-college Consortium that had agreed to implement the eight guiding principles of the Single Structure Strategy.

Differences. Each college had unique application procedures that reflected the type of CTE program offered. For the Consortium initiative, UCC offered licensure in Radiological Technology, SCC offered a licensure as a Psychiatric Technician and ACC offered an agriculture manufacturing certificate program. Two programs, UCC and SCC required prerequisites prior to entry into the CTE program.

Embedded Tutoring

Embedded tutoring was the most commonly used embedded remediation practice in the three case study colleges, although implemented somewhat differently at each college. At all three colleges, the way that tutors operated within the program appeared to be a mixture of the two most commonly used tutoring practices in higher education: (a) the College Reading and Learning Association (CRLA) model and (b) the SI model.

CRLA certifies colleges and universities to train peer tutors and provides internationally accepted standards of skills and training for tutors. The CRLA model is the most widely adopted model among colleges and is focused on the recipient student's questions and need to learn during the tutoring session. Peer tutors have continuous training and oversight by a trained faculty member in the

tutoring center. The peer tutor does not attend designated classes and does not have a pre-determined plan for the tutoring session (CRLA, 2014a). Tutoring centers may provide drop-in tutoring, have tutoring by appointment or a combination of both.

SI is an academic assistance program that utilizes peer-assisted study sessions where students compare notes, discuss readings, develop organizational tools, and predict test items. Students also learn to integrate course content and learning habits while working together (Martin & Arendale, 1990). Student leaders are embedded into the classroom and are referred to as SI Leaders rather than tutors. SI Leaders come to the study session with a pre-conceived plan of what will be covered. SI involves a highly structured model with clear training guidelines for peer leaders through the campus tutoring center and the collaboration of faculty utilizing peer leaders in the classroom.

SI and general tutoring have been used by a number of community colleges in California. In 2011-2012 California Community Colleges overall spent 55% of Basic Skills Initiative allocations on SI and tutoring (Illowsky et al., 2013). This expenditure was in addition to funding provided by the general fund budget for tutoring. However, modifications of the SI model have been necessary at community colleges to accommodate differences between a 4-year university and a 2-year college (Illowsky et al., 2013). Further, studies have shown that SI is an effective model to improve outcomes for basic skills students (Boylen, 1997; Illowsky et al., 2013).

As shown in the findings of the three case studies, adoption of SI, even when the model is modified, proved difficult due to the uniqueness of Career Technical Education programs. CTE programs are intense 6-month to 2-year programs, often requiring full-time attendance for the duration of the training.

Ultimately students secure employment in the job for which they earned a certificate, and these jobs are in well-paying industries that provide students with family sustaining wages. A student is not likely to return as a tutor making $8.00 per hour.

Similarities. All three case study colleges utilized one or more peer tutors in the designated career program. After overcoming initial challenges, each college employed former or current program students as peer tutors. Each college also offered some form of training for the peer tutor. The CTE faculty at all three case study colleges firmly believed that peer tutoring was an embedded strategy that had assisted their programs in achieving increased student outcomes.

Differences. Each case study college took a slightly different approach to training and embedding the peer tutors. Urban Community College fully embedded the peer tutors into the classroom. The peer tutors were second year students in the Radiologic Technology program and received clinical hours for their time as a tutor. Peer tutors spent time in the classroom and facilitated learning during the class. This was especially true for the patient positioning class. The peer tutors also provided study sessions outside the classroom lecture at set times (e.g., lunch break, before school, and after school). Attendance at tutoring sessions was not mandatory, but highly recommended.

All students in the UCC focus group indicated that they were familiar with the tutors, understood the tutors' role in the program and had utilized the tutors on at least one occasion. Terrie commented, "They're second-year students so they've already experienced what we've gone through and now they're about to take their national [licensure exam], so we're learning from them on everything they already learned in our situation" (personal communication, March 5, 2014). Further, the CTE faculty noted that they meet regularly with the tutors to go over the material

that will be covered in class. Sean stated, "Before I even start a whole chapter I'll go over what I'm looking for the students to comprehend and pull out of my lecture with the tutors. That way they can also help" (personal communication, February 19, 2014).

Agriculture Community College used students from their EST Scholars program to work as peer tutors. These students were enrolled in the 2-year Engine Service Technician program, earning their associate's degree along with their certificate rather than taking the 1-year accelerated program that only provided the certificate. The peer tutors received a 2-hour orientation and training at the start of their tutoring job in August 2013; they had not received any subsequent follow-up training. Some of the peer tutors had already taken the class they were tutoring for and others were currently enrolled as a student in the class for which they were tutoring. Those tutors currently enrolled participated in class the same as other students. During the classroom observations the presence of a peer tutor in the class was not obvious.

At ACC, tutoring was provided 1hour before school, during lunch and 1 hour after school. Students in the 1-year Consortium program were required to attend tutoring 2 hours per week (1 hour for each course taken). A schedule was created at the start of each semester and the tutoring times were balanced out so that no time slots were overloaded with students. Students in the 2-year program were also required to attend 1 hour of tutoring per week.

One other form of embedded tutoring used at ACC was commercially produced on-line modules designed to assist students with reviewing technical content material that also involved the application of reading and math skills. Students were required to complete a specified number of on-line modules during a semester. The students could use the computers in the lab or work on the

modules at home. Students could also complete more than the required number of modules and both students and faculty indicated that students took advantage of this resource.

Suburban Community College had a peer tutor for the Psychiatric Technician program, but the tutor was not embedded in the classroom. The peer tutor, provided through the Nursing Success Center, was a former Psychiatric Technician student taking additional courses to achieve an associate degree. The tutor received a 2-hour orientation and overview provided by the campus tutoring center when she was hired in January 2013 and had not been given any additional training. However, she did choose to attend a workshop on APA citation style. The tutor provided one-on-one tutoring by appointment. She reported that she checked-in with the faculty regarding the current lecture topic, but did not attend the lectures.

Communication and Collaboration

In their book, *Switch: How to Change When Change is Hard*, Chip Heath and Dan Heath (2010) discussed the importance of communication when implementing change. Change is often difficult and slow. Participants in the three case studies discussed the importance of communication and collaboration to facilitate change. Faculty members believed that the positive communication they had with each other and their immediate supervisor in the program contributed to the success of the redesign of the CTE program. Further, faculty at the case study colleges believed the collaboration with faculty across the campus (e.g., Tutorial Center) and at other colleges within the Consortium facilitated the development of embedded remediation and was critical to achieving the success experienced so far.

Similarities. Each case study college created a team to work on embedding remediation in their CTE program. Faculty members cited the assistance of college leads and administrators as a critical factor in the program implementation. Steve, the CTE instructor at SCC said, "The administration and also [Name] the division dean here, have been very supportive through the whole process, so I couldn't have asked for more support in that way" (personal communication, April 1, 2014).

Participants at all three case study institutions discussed working collaboratively with the tutoring center to train tutors through existing processes, as well as maintaining communication within the CTE programs. Each faculty member at the case study colleges mentioned collaboration with colleagues as a vital link in their program. For example, Justin from ACC stated, "We worked cooperatively with the other two instructors. . . . We share an office so constantly we're bouncing ideas off each other, talking about what's going on in the program, great, great communication that goes on there" (personal communication, March 4, 2014).

Differences. The college faculty members reported differences in their communication style and how the faculty members interacted together. SCC utilized the Basic Skills English instructor extensively to provide remediation in reading, writing and soft job skills outside of the classroom instruction. The remediation was embedded into the program structure by requiring that students take 2 hours of basic skills remediation, but remediation was not embedded into the actual classroom instruction. Although Jean attempted to contextualize the on-line basic skills packets based on the courses by providing case studies, research assignments, and literature reviews, the students perceived this embedding approach to be busy work and Jean felt disconnected from the students.

Faculty and tutors had difficulty with finding time to communicate and collaborate. Jean stated,

I haven't really had time to meet very much with Steve because of his schedule, not because he wouldn't want to, but because he's really the bedrock instructionally. He would be the one who could give me a better sense of what the students need in terms of remediation. (personal communication March 11, 2014)

Steve echoed Jean's observations stating, "[There is] a lack of communication between the basic skills [instructors] and the [CTE] instructors and I think partially that's because of the way the adjunct's [work] . . . here" (personal communication, April 1, 2014). The lack of instructor availability was evident in the difficulty of scheduling the research interviews. Steve taught from 8:00 am to 4:00 pm each day with a 1-hour break for lunch. The basic skills instructor was an adjunct and not on campus every day.

UCC utilized basic skills faculty more as consultants. The CTE faculty and the math and English faculty met a few times to discuss needs in the program and get teaching ideas from the basic skills faculty. The English faculty member came into the classroom a couple of times to give a lesson on the correct use of the APA style of formatting.

CTE faculty members at ACC did not collaborate with the basic skills faculty for the embedded remediation; they chose to focus only on the embedded tutors. The tutors were enrolled in the certificate program and therefore were in class and the shop with the instructors on a daily basis. This arrangement provided an enhanced level of communication between the tutors and instructional faculty.

Professional Development

Professional development is an important ingredient when initiating change in an institution. The Consortium's scope of work outlined in the grant did not specifically address professional development as a key strategy, but it was understood that faculty training in some form was necessary (Consortium meeting minutes, January, 2012). To meet the need for professional development, the Consortium provided a number of training opportunities at regularly scheduled Convergences throughout the grant period (Consortium web site). The responses of the faculty interviewed at the three case study institutions reflected varying degrees of knowledge regarding professional development and the grant.

Similarities. Almost all faculty members mentioned the Consortium by name as a place where some faculty development occurred for the grant. All faculty members interviewed indicated that they had attended at least one convergence during the 2 years the grant had been in place.

Differences. Each college had engaged in the Convergences and other professional development offered at different levels and had varying attitudes towards the need for professional development. The faculty at UCC stated that they had attended a majority of the Convergence meetings with one faculty member having attended all of them. This faculty member stated that the Convergences provided relevant information and he credited one particular training session as a catalyst in redesigning his classroom environment.

At ACC, Justin acknowledged the Consortium Convergences and attended most of the trainings. Justin stated that the Convergence's did not offer specific strategies for embedded remediation. However, all three of the faculty members in the ETS program had gained relevant experience while previously teaching in a high school. Jon stated, "I think we all come from high school, all three of us, and

so whatever basic skills and strategies that we learned in high school for high school teaching we carried with us" (personal communication, March 31, 2014).

Both faculty members at SCC spoke of attending at least one Consortium Convergence as a way to learn more about the grant and expectations of the Single Structure Strategy; however, they were not able to attend all of the meetings. The adjunct instructor did not become part of the Consortium team at SCC until well into the second year of a 3-year project; therefore, she was unable to attend many of the Convergences. The adjunct instructor expressed interest in obtaining more training and indicated that she had done some research and training on her own.

Recommendations

All three case study colleges had recommendations for the programs. The faculty recommendations focused on practices that would assist other colleges in implementing embedded remediation in CTE programs. The tutor and student participant recommendations focused on ways the current CTE program could be improved.

Faculty. The primary recommendation from all three case study colleges focused on communication. Each faculty member believed that a key factor in the success of the program thus far could be attributed to increased communication, although they felt that more communication was still needed. Each faculty member suggested that colleges considering making changes needed to create a space for all stakeholders to meet together and plan prior to implementing embedded remediation. In addition, they recommended integrating program changes into the program and college culture. All faculty members involved should present the same message to students, thereby providing students with clear expectations and a common focus. Jon, from ACC, discussed this idea during his interview; "I think because there's three of us in here and we all kind of push the

same thing, so if the same message is out there, that's just what the expectation is" (personal communication, March 31, 2014).

Tutors. Each tutor cited communication with faculty as an important element of the tutoring program and one that is necessary for the success of the program. The tutor at SCC believed that structure contributed to the success of the program. Tutors need a specific person that they work with to assist with scheduling, space and contacting students. The tutors also recommended that tutors be carefully selected. Jarrod, the tutor at ACC, suggested including interviews in the tutor selection process, as was done at his college. He thought this was an important aspect of the selection because not everyone has the level of motivation necessary to be a good tutor.

> I just think who you choose is really important, because there [are] people that don't want to put in extra time, they kind of just want to get through things, and there's people that don't mind taking on this extra role. (Jarrod, personal communication, March 4, 2014)

Students. The student focus group participants' primary recommendations were related to tutor selection and training, as well as the tutoring structure. The students highly recommended that tutors be selected carefully and that the tutors receive adequate training. Josh, a student from ACC, discussed the importance of selecting the right person to be a tutor: "For the selection of tutors, definitely pick someone that would be worth the time to have here, not someone that's just kind of getting some credits (personal communication, March 4, 2014). In addition, the students recommended that the tutoring sessions be structured and focused in order for students to receive the most benefit.

Summary

This chapter reported the findings of the study through an analysis of each case study college. A cross-case analysis was also conducted to identify common

themes and practices as well as differences in implementing embedded remediation at the three colleges. Commonalities among the case study colleges included the use of peer tutors, faculty as tutors and additional basic skills information. However, the level of implementation and the utilization of approaches varied widely between the colleges. In addition, one case study college implemented a flipped classroom model to improve student outcomes. All the participants at the case study colleges indicated that communication and collaboration with administrators, colleagues, tutors and students were necessary to implement changes for embedding remediation in the classroom.

CHAPTER 5: SUMMARY, CONCLUSIONS, AND
RECOMMENDATIONS

In this chapter, the background, purpose and research methods are reviewed; answers to the research questions are summarized; findings are viewed through the study's theoretical lens; and conclusions are discussed. The chapter culminates in recommendations for practice and further research.

The Consortium

In 2010 the U.S. Department of Labor authorized the Trade Adjustment Assistance Community College Career & Training (TAACCCT) grant to help community colleges redesign career technical education pathways to improve student outcomes, shorten time to completion and move students into high paying jobs. A consortium of 10 colleges in a large, regional, geographic area of California applied for and received a 3-year grant. The Consortium adopted a Single Structure Strategy utilizing eight actions recommended by Complete College America to improve student outcomes in the grant identified career pathways. Embedded remediation was one of the eight elements.

Purpose of the Study

The purpose of the research study was to explore the implementation of embedded remediation in designated CTE pathways at selected California community colleges in an effort to identify promising practices. Five research questions served to guide the study:

1. How can embedded remediation at each case study community college be characterized and how did the implementation evolve?

2. How are faculty trained to embed remediation?

3. How do faculty members perceive that the implementation of embedded remediation has affected student learning, completion and preparation for employment?

4. What recommendations do faculty members have for embedding remediation in CTE programs?

5. How do students perceive embedded remediation in relation to their learning?

The aim was to provide a research based analysis of the case study institutions' experiences and discover promising practices that might be useful to other community colleges as they plan to redesign their CTE programs with embedded math, reading, writing, and study skills. This work is of national importance as shown in a recent U.S. Government Accountability Office (2013) report that highlighted the lack of empirical research regarding strategies for retooling developmental coursework to improve student outcomes. Moreover, few studies have explicitly examined the role and structure of embedded remediation in Career Technical Education pathways.

Research Design

The study used a qualitative multi-case study method to examine three colleges within the Consortium. Semi-structured interviews were conducted with two faculty members (CTE or basic skills) and an embedded tutor in the designated CTE program. One student focus group was conducted at each case study institution; participants were selected by the instructor, or volunteered on their own. UCC and SCC each had 10 students in the focus group and ACC had eight student participants. In addition, two classroom observations were conducted at each college. The interviews and focus groups were audio taped and transcribed by a professional transcriber. Field notes were written by hand during observations

and later typed into a Word document. A content analysis was conducted for documents, field notes, observation notes and transcripts, paying particular attention to triangulation of the data.

Research Questions and Findings

Research Question 1

The first research question asks how can embedded remediation at each case study community college be characterized and how did the implementation evolve? Each case study college is a member of a Consortium of colleges in a large geographical area of California. The Consortium was formed in response to a grant through the U.S. Department of Labor called the Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant. Each college in the Consortium agreed to redesign a designated career pathway using a Single Structure Strategy that included embedded remediation as one of eight actions.

Each of the case study colleges used three specific strategies for embedded remediation. First, all three colleges used peer tutors as the primary strategy. In theory, the concept of peer tutors, who were embedded in the CTE program and who provided additional support to students in the areas of technical content, math, reading and writing, was the same for each college. However, in practice, the format and structure of the peer tutoring slightly differed among the colleges. For example, tutoring was mandatory at one college and voluntary at the other two colleges. Second, the faculty members at all three colleges indicated they were available to students and provided tutoring that facilitated learning. Again, the format and structure were slightly different at each college, but the students at all three colleges noted the availability of the faculty as a positive characteristic.

Third, the colleges offered additional material regarding reading, writing and math literacy either through on-line modules, open education resources, or through materials supplied by the basic skills instructor.

Faculty members at each case study institution were asked to describe their involvement in embedding remediation in the CTE program in which they taught. All faculty members interviewed stated that the Consortium's TAACCCT grant was the impetus for change in the CTE program. Those interviewed also indicated that they did not make changes to their programs just for the purposes of the grant, but were interested in making significant changes that could be sustained after the grant money is no longer available. This attitude of sustained change was a catalyst for faculty to focus on embedded remediation strategies that would have the greatest impact over time, but could also be managed by the faculty without adding additional costs. Justin from ACC shared the thinking of the faculty at his college when the grant discussions first began.

> When we were first pitched the idea of the grant and the eight guiding principles we kind of sat down and said the thing we don't want to do is change just to change to meet the letter of the grant because we're not just going to go after the money. (Justin, personal communication, March 4, 2014)

The faculty were enthusiastic about implementing the single structure strategy and efforts to further develop their practices for embedding remediation are likely to continue beyond the grant.

The faculty members interviewed for the study also characterized the implementation of embedded remediation as a process of communication and collaboration with basic skills faculty, tutoring center faculty, and administrators across their own campus, as well as with other colleges in the Consortium. This communication and collaboration led all of the college faculty study participants to adopt embedded tutoring as a primary strategy to embed remediation. The level

of communication and collaboration varied among the colleges; however, all interviewed faculty agreed on the importance of communication and collaboration when implementing embedded remediation.

Research Question 2

The second research question was how are faculty trained to embed remediation? All faculty interviewed in the study were aware of professional development provided by the Consortium at Convergences offered each semester. Consortium documents indicated that each consortium focused on different topics of relevance to the TAACCCT grant, including embedded remediation. Convergence 2, 3, 4, and 7 specifically focused on embedding remediation and provided faculty with a variety of options that could be implemented in the classroom. The attendance of faculty members at training sessions varied with one attending all of the sessions and most only attending a few. Jean, from SCC had attended the fewest, as she had only been involved in the grant project since January of 2012. Jeremy, the faculty member who attended all of the Convergences, cited the training as the catalyst for the greatest change in the classroom environment in his program, particularly Convergence 4, which provided training on Supplemental Instruction.

However, none of the faculty members mentioned the specific training opportunities provided by the Consortium Basic Skills Redesign Team for further development of embedded remediation, nor did the faculty attend. As shown on the Consortium web site, and in various meeting minutes and flyers, two trainings were provided on Reading Apprenticeship. One training session offered an introduction to the embedded strategy and the second was a 6-week on-line training on embedding reading strategies into the course content. These trainings were free of charge and promoted to participants via the Consortium email list

serve and announcements at regularly scheduled Consortium-wide conference calls.

Additional training mentioned by most of the faculty participants included trial and error, collaborating with others who were also attempting to embed remediation, training as a former high school instructor and communicating with basic skills faculty on the campus. A few faculty members thought further training would be helpful and one cited a specific training in Reading Apprenticeship, that she wanted to attend, but did not have the time to participate. Other faculty members indicated that they were comfortable with the level of training provided and did not need additional professional development in embedded remediation.

Tutors also were asked about the training they had received to tutor inside and outside the classroom. Most of the tutors indicated that they had received an orientation and overview of tutoring responsibilities. The first tutors used at UCC were trained by the college's SI program and also received follow-up training throughout the year. However, the current tutors at UCC did not receive the same level of training (Jeremy, personal communication, February, 19, 2014). The tutor at UCC indicated that her first year as a student in the program served as her training for being a tutor: "My first year. That was my training and my prep, I guess" (Leah, personal communication, February 19, 2014).

Tutors at SCC and ACC discussed a 2-hour orientation that was required of them prior to starting as a tutor. The orientation provided an overview of tutoring and minimal teaching strategies that could be used during tutoring sessions. The tutor at ACC indicated that he also received a packet of information that contained strategies that he could use while tutoring. He stated that he did not use the packet often and usually had done what he found worked for students. "You kind of feel it out as you go. I've kind of seen what works and what doesn't and what students

like and what they get the most out of. . . . My own self training, kind of" (Jarrod, personal communication, March 4, 2014).

Research Question 3

This research question asked how do faculty members perceive that the implementation of embedded remediation has affected student learning, completion and preparation for employment? Each faculty member interviewed perceived that the changes made in the program as a result of participating in the TAACCCT grant had positively affected student learning, completion and preparation for employment. The faculty all cited improved test scores, improved completion rates and improved retention rates as evidence. Two colleges have had cohorts complete the designated program and the faculty reported improved outcomes for those students. For example, in ACC's first Consortium cohort that finished in May 2013, 37 of the 40 students completed and were currently employed in the field of ETS (Justin, personal communication, March 4, 2014).

The Psychiatric Technician program at SCC has graduated two Consortium cohorts; the first cohort finished in May of 2013. Steve reported that the successful completion rate on the state licensure exam for these students was 87%, which was a 10% increase from the previous year. The second cohort completed in January of 2014 and the third cohort will complete on May 5, 2014. Students from these two cohorts have not yet taken their state licensure exam; however, the faculty noted that completion rates had improved since implementing the Consortium's TAACCCT grant.

UCC's CTE pathway for the grant is a 2-year certificate program. The Consortium cohort started in August of 2012 and will complete their training in June of 2014; therefore, they have not yet taken the national licensure exam. However, both faculty members indicated that retention of students and test scores

have improved due to the program redesign. The program accepts 36 students each year and historically loses up to 12 students throughout the 2 years of the program. According to the faculty, only five students had dropped out of the Consortium cohort. The faculty believed that the redesign of their program to embed tutors and create a new learning environment had contributed to this increase in retention. The faculty also noted that test scores had improved with a greater number of students earning As and Bs on exams.

Research Question 4

The fourth question asked what recommendations do faculty members have for embedding remediation in CTE programs? The faculty members at all three colleges believed that communication and collaboration are requirements for embedding remediation. The faculty members interviewed for this study cited the collaboration with each other, the tutorial center on campus and administrators as essential activities. Each interviewee indicated a different level of communication and collaboration occurred on their campus. Those faculty members who indicated a high degree of communication and collaboration had the most integrated and engaged tutoring program. The college faculty who experienced the least amount of communication and collaboration also had the least integrated and engaged tutoring. Another theme that addressed this question related to change. Several faculty members discussed the importance of having an open mind and a willingness to change classroom practices in order to improve student outcomes.

Research Question 5

The final research question asked how do students perceive embedded remediation in relation to their learning? In general, students were not aware of the term embedded remediation nor were they able to define the term. Yet, they were

aware of their learning and the processes in place to assist them with their learning. The students in each focus group described the tutoring that was available to them in the program. However, at two of the colleges there were differing views on the efficacy of the tutoring provided. Approximately seven students at SCC and almost all the students at ACC responded with negative comments about the embedded tutoring. The students were not opposed to having a tutor and in general thought tutoring was a positive idea, but they were opposed to what they perceived as untrained tutors who were not able to provide accurate information or focused tutoring sessions.

The students in the UCC focus group shared positive comments about the tutoring in their program. They expressed an affinity to the tutors and indicated an understanding of the role of the tutor. The students in the focus group expressed their appreciation for the tutors and the help they had received from the tutors.

The Theoretical Lens

Learning-centered theory, which is based in constructivist learning theory, provides a framework to describe the classroom environment for optimal learning. The themes of self-regulated learning, shared power between the teacher and student, teacher as a guide, meta-cognition and use of evaluation for learning are at the heart of the learning centered classroom (Weimer, 2002). The way in which learning theory is manifested in the CTE classroom is important to the implementation of embedded remediation. Throughout the interviews, focus groups and classroom observations the themes that define learning centered classrooms were evident to varying degrees at each case study institution.

Dewey believed that students learn best by experiencing and participating in their own learning rather than being passive recipients of the instructor's knowledge (Dewey, 1963). CTE classrooms are inherently organized as

experiential classrooms because technical education programs typically include some hands-on learning through labs. The three case study colleges implemented learning centered strategies in the classroom in varied ways. For example, at UCC students taught pieces of the content from the chapter, practiced patient positioning in the lab and reviewed the taped lectures as often as needed to practice learning. At ACC, the instructor had pictures of different nozzles on PowerPoint slides, but he also had actual nozzles that he passed around the class for students to examine. He used the document camera to enlarge the actual nozzle and pointed out different parts to the students as he lectured. At SCC, the instructor asked students to share experiences and comment on the material from the lecture and video presentation. The instructor facilitated and guided the conversation to keep it connected to the day's lesson.

When the learning centered practices were implemented, even if in a limited way, students reported in the focus groups being more engaged and aware of their own learning processes. Robert shared this reflection on how he learned best:

> It kind of goes back to . . . how we ourselves can benefit most from our study habits. So some can benefit a lot more from studying as groups, some of them study by ourselves. For me I prefer to study by myself because as a group I get distracted. (personal communication, April 1, 2014)

Conclusions

The study revealed a problematic lack of clarity among the case study institutions regarding the definition of embedded remediation at the time faculty began working on planning and implementation. The TAACCCT grant narrative provided a general concept of embedded remediation rather than a specific definition or guidance on implementation. Although a common definition and

guidelines would have been helpful, this lack of clarity seemed to create a dynamic among the participants that is best described as "creative tension" (Senge, 2006, p. 139). In his book, *The Fifth Discipline*, Senge defined "creative tension" as a gap that catalyzes action: "The gap between vision and current reality is . . . a source of energy. If there were no gap, there would be no need for any action to move towards the vision" (p. 139) Thus "creative tension" became a useful tool for the case study colleges. A lack of clarity compelled faculty to engage in multiple discussions about embedded remediation and how changes could be implemented in the designated CTE programs. Although clear definitions and common structures are needed for continuity, faculty also need some autonomy and flexibility to adapt to the diverse backgrounds of students and constant changes in the job market.

The Consortium-wide meetings, titled Convergences, were useful in providing cohesion to the processes and implementation of the embedded remediation. Convergence 2 was specifically focused on establishing a more refined understanding of embedded remediation and the types of strategies that would be used. In addition to providing training and support, these meetings offered a space for faculty to share ideas, discuss implementation plans and align curriculum across institutions. Four of the Convergences focused on basic skills and embedded remediation. The Consortium initially held weekly conference calls where college leads and faculty received updates from other colleges, reminders of meetings and other pertinent information. After the first year, the calls were reduced to twice per month.

The effectiveness of the Convergences was limited, as most of the faculty at the case study colleges did not attend every meeting. Each interviewee indicated they had attended at least one or two meetings, but only one faculty participant

had attended each Convergence. Lack of attendance was attributed to the faculty's intense teaching schedules, and not a lack of interest in professional development. The college whose faculty member had attended all the Convergences evidenced a deeper understanding of the purpose of embedded remediation and completed a redesign of his entire classroom structure due to the training he received at one of the Convergence's. While the Convergences were well planned, more than one approach to delivering faculty training should be considered. For example, training could be videotaped and placed on the Consortium web page, training materials could also be made available on-line and classroom observations with feedback for the instructors could be periodically scheduled (Boroch et al., 2007; Lindstrom & Speck, 2004; Perin, 2000).

The Consortium leadership knew that a grant project of this magnitude would necessitate broad communication and collaboration. The Convergences and regularly scheduled conference calls provided a deeper sense of communication and collaboration than are normally seen in grant projects. Increased communication and collaboration was also required at the local college level. The three case study colleges had varying levels of communication and collaboration. The level of implementation at each case study college was parallel to the level of implementation of embedded remediation. The college faculty that reported the greatest level of communication with other faculty in the program and collaboration with colleagues across the campus and with colleagues across colleges had the deepest implementation levels of embedded remediation. Communication across the campus and discipline does not occur automatically. The type of communication and collaboration needed to implement embedded remediation in CTE programs must be identified and nurtured (Boroch et al., 2007; Lindstrom & Speck, 2004; Perin, 2000).

Professional development is an integral piece to implementing change. The Consortium provided formal professional development through the Convergences and two additional trainings on Reading Apprenticeship. However, the faculty in the three case study colleges, with one exception, did not attend many of the trainings provided. Another form of professional development, often overlooked, occurred during faculty collaboration when the faculty learned from discussing their thoughts and practices with each other. Two of the case study colleges were able to take full advantage of this informal learning. At each of these colleges, the faculty shared offices, classrooms and lab spaces; they were constantly reflecting on the program and the implementation of changes for the TAACCCT grant. These informal conversations often led to further improvements in processes and implementation. However, just having professional development opportunities available for faculty is not enough. Faculty need to be part of the planning and implementation of training (Academic Senate for California Community Colleges, 2000; Boroch et al., 2007), which includes on-going professional development activities that help sustain the instructional changes. Faculty members also need time to engage in inquiry together.

Several types of embedded remediation were used at the case study colleges including peer tutoring, faculty support, on-line modules that were integrated into the program and additional basic skills materials that were not integrated into the classroom instruction. The primary strategy used by the colleges was peer tutoring with former students working as peer tutors. However, just having a peer tutor is not enough. The tutor must be carefully selected, properly trained and fully integrated by working collaboratively with the instructor. Tutor training for the current tutors ranged from nothing to a 2-hour orientation and a packet with suggested strategies. The lack of training showed through in student perceptions of

tutors as untrained and unhelpful. Training tutors not only improves the quality of tutoring but also enhances the qualifications of the peer tutors as graduates of the program. However, tutoring is only as effective as the environment in the classroom (Boroch et al., 2007; Martin & Arendale, 1990), which is created by the instructor and depends on faculty-tutor collaboration.

Tutoring was not required of students in all of the case study colleges. Students have many demands on their time and usually only do what is required of them in the program. If the program does not require tutoring, the student most likely will not attend. The embedded tutoring program that required all students to participate at designated times has seen improved student outcomes. ACC reported that 37 of 40 original Consortium cohort students completed the certificate program and were placed in jobs in the field for which they trained.

The case study colleges embraced peer tutoring as a way to embed remediation within the program and this strategy showed promise as an effective practice. However, including additional proven strategies for embedding remediation would have strengthened the implementation in the CTE programs. For example, although the Consortium offered training in Reading Apprenticeship, which is an effective strategy to improve reading comprehension among students (Schoenbach et al., 2012), none of the participating faculty took advantage of the training to embed this strategy into their classroom.

One faculty member did adopt a flipped classroom strategy that resulted in a complete redesign of his class format. He decided to change his approach to teaching after attending the SI training provided by the Consortium. He liked the teaching strategies that were taught to SI leaders and wondered if he could apply them in his classroom. The results of his classroom redesign are noteworthy. Students were engaged in the learning process as active participants rather than

passive observers. The two faculty participants reported improved scores on exams and increased student retention. Adopting learner centered strategies, such as those taught to SI leaders, as the pedagogy of the classroom can assist in the development of self-regulated and self-directed learners (Barr & Tagg, 1995; Boroch et al., 2007; Perin, 2011; Weimer, 2002).

Students perceived that faculty academic support was a beneficial form of remediation for which they were grateful. The faculty also mentioned their availability to students but viewed this support as standard practice. Faculty support is an important aspect of embedding remediation. Studies have shown that students are more likely to succeed if they feel supported by their instructor (Booth et al., 2013; Boroch et al., 2007; Rosenbaum et al., 2006). Faculty investment in student's learning often provides the incentive a student needs to persist and complete a project, a remediation, a course, or a degree or certificate.

Faculty in this study had a unique relationship with their students as these faculty often taught all the major components of the certificate programs. CTE programs frequently are intense 1- or 2-year programs where the students are in class all day with the same two or three instructors. This level of contact provides CTE faculty with an opportunity to create learning centered environments that provide students with the depth of learning necessary to compete in today's global world. The use of embedded tutors, faculty academic support, on-line study modules and the flipped classroom enhance the learning environment (Boroch et al., 2007; Chickering & Gamson, 1991; Martin & Arendale, 1990).

Recommendations

Seven recommendations regarding promising practices in the implementation of embedded remediation for CTE programs have emerged from the analysis of approaches that worked well and lessons learned from challenges

faced by the three case study colleges. Also, this research study points to four areas that warrant further research.

For Practice

      Common definitions. A clear definition of critical terms, such as embedded remediation, is essential to coherent planning and implementation. In the study, improved definitions, which were clearly understood and articulated by all stakeholders, would have facilitated the change across the disciplines.

      Communication. Communication is key to implementing systemic changes within a CTE program. This type of communication requires conversations with all stakeholders, including faculty, administrators and students, prior to implementing sweeping changes in practice. Colleges should schedule regular meetings with all stakeholders to review processes and changes within the program. Further, monthly update status reports should be provided to all stakeholders within each college.

      Collaboration. Collaboration with colleagues throughout the college is essential for improved student outcomes. CTE programs benefit from utilizing resources and services that can assist faculty to embed remediation as well as other student resources. Colleges should provide time and space for faculty members across the campus to collaborate and coordinate essential academic services for students within the CTE programs.

      Faculty training. Faculty training in the area of remediation is essential for instructors to have the tools needed to embed remediation into their courses. Although, heavy teaching schedules for CTE faculty are a challenge, college administrators should consider adding paid instructor time for focused teacher training. The costs could be supported through grant funding or through the

general fund. In addition, other methods for delivery of training should be explored.

Peer tutor training. Good quality and on-going training of peer tutors is needed along with clear guidelines concerning the tutor's role in the classroom and explicitly articulated expectations from the CTE faculty members. Tutors should be integrated into the training provided to all campus-wide tutors through the tutoring center. Colleges should ensure that their tutoring processes, at a minimum, meet the international guidelines set forth by CRLA. Further, a new tutoring model is needed for CTE programs and the research study provides preliminary evidence that a mixing of the two models could lead the way to addressing this need. A modified use of SI tutors would work particularly well in the lab portions of some CTE programs.

Required attendance. Students should be required to attend tutoring sessions. Studies indicate that students do not avail themselves of support services when those services are optional (Boroch et al.; Rosenbaum, et al., 2012). Tutoring sessions need to be integrated into the program design in a way that makes tutoring part of the culture of the CTE program for all students.

Multiple strategies. Faculty should embrace multiple strategies for embedding remediation including approaches that have been proven to support student learning in general. Strategies such as Reading Apprenticeship, Habits of Mind and the Flipped Classroom provide deeper learning to improve students' critical thinking and literacy skills (Costa & Kallick, 2008; Schoenbach et al., 2012). Moreover, use of the theoretical framework applied in this study would enable instructors to develop student centered teaching techniques that enhance the implementation of embedded remediation in the CTE programs.

For Research

      This study focused specifically on the implementation of embedded remediation as part of the Consortium's TAACCCT grant. The study did not examine the other seven guiding principles that make up the Single Structure Strategy of the grant. Research should be conducted to determine the impact of the Single Structure Strategy on teaching practices and student outcomes.

      Moreover, this study only examined three colleges within a Consortium of 10 colleges. Additional research is needed regarding implementation of embedded remediation in the other CTE programs. Factors to consider are length and structure of the certificate program as well as admissions criteria. Further, research also should be done to examine the actual impact that classroom changes may have had on employment outcomes in the Consortium TAACCCT grant.

      This study indicated that the college with the greatest amount of communication and collaboration implemented remediation to a greater degree than did the college that exhibited the least amount of communication and collaboration. Communication and collaboration within the programs and this finding should be researched further. Moreover, additional research is needed to define or characterize effective communication and collaboration within CTE programs. As colleges continue to plan for and implement change, descriptors of successful communication and collaboration components and styles would be helpful.

      Lastly, further research into the efficacy of the flipped classroom concept as defined in this study is necessary. Although a great deal of discussion has occurred regarding flipped classrooms and the most effective strategies for implementing this practice, research-based models specific to CTE programs and embedded

remediation would be helpful. The approach developed at UCC merged varying aspects of the flipped classroom that warrants further research.

Summary

The study demonstrated that remediation can be embedded in accelerated CTE pathways through the use of various strategies. One approach used in the grant was the SI structure. Training of faculty and tutors emerged as an essential practice. Collaboration and communication also were essential and motivating characteristics in the process of planning and implementing embedded remediation. The faculty became progressively more engaged in the process of embedding remediation as time went on and even faculty who were most opposed to the change were won over by the retention and learning outcomes. The efforts of the Consortium colleges and this research serve as informative pilots that should be built upon by other practitioners and researchers.

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APPENDIX A: CONSORTIUM SINGLE STRUCTURE STRATEGY:

EIGHT GUIDING PRINCIPLES

Complete College America's (2011) highlighted eight inter-related and inter-dependent factors associated with high completion rates in community and technical colleges:

1. **Design an Integrated Program:** The full set of competencies for each program should be prescribed up front and students should enroll in a single, coherent program – not individual, unconnected courses. Students should not be required to navigate through complex choices or worry about unnecessary detours. Instructors should share accountability for helping the students successfully complete the whole program.

2. **Enact Cohort Enrollment:** Students should be grouped as cohorts in the same prescribed sequence of classroom and non-classroom instruction.

3. **Implement Block Schedules:** Programs should operate on a fixed classroom meeting schedule, consistent from term to term. Students should know their full schedule before they begin and know when they will be done.

4. **Compress Classroom Instruction:** Non-classroom-based, asynchronous instruction methods using contemporary technology should supplement traditional classroom instruction to compress seat-time requirements and strengthen the curriculum.

5. **Embed Remediation:** Most remediation should be embedded into the program curriculum, supplemented as necessary through instruction that is parallel and simultaneous to the program, rather preceding it. Students should develop stronger math and English skills as they build program competencies, using the program as context, and there should be clear basic skill outcome expectations with rigorous assessment.

6. **Increase Transparency, Accountability and Labor Market Relevance:** The programs should be advertised, priced, and delivered as high-value programs tightly connected to regional employers and leading to clearly defined credentials and jobs. Clear and consistent information about tuition, duration, success rates, and job placement outcomes will enable students to assess costs and benefits, see the reasons for continued attendance, and make the sacrifices necessary to achieve program goals. Programs should be held accountable to rigorous and consistent national accreditation standards.

7. **Deploy transformative technology:** Technology should support instruction and customize, deepen, accelerate and support student learning. This includes redesigning courses across systems using technology, blended learning models and using **open textbooks and courseware**. Shared and syndicated enrollments should also be used across campuses.

8. **Improve Student Support Services:** The Consortium grant offers the opportunity to test and demonstrate how better to embed student supports into program structures, using

technology and partnerships with employers and community-
based organizations to supplement traditional support services
(Consortium grant narrative).

APPENDIX B: 16 HABITS OF MIND

1. *Persisting:* Stick to it. Persevere with task through to completion; remain focused. Look for ways to reach your goal when stuck. Do not give up.

2. *Managing impulsivity:* Take your time. Think before acting. Remain calm, thoughtful and deliberative.

3. *Listening with understanding and empathy:* Understand others. Devote mental energy to another person's thoughts and ideas. Make an effort to perceive another's point of view and emotions.

4. *Thinking flexibly:* Look at it another way. Be able to change perspectives, generate alternatives, and consider options.

5. *Thinking about your thinking (Metacognition):* Know your knowing. Be aware of your own thoughts, strategies, feelings and actions and their effects on others.

6. *Striving for accuracy:* Check it again. Always do your best. Set high standards. Check and find ways to improve constantly.

7. *Questioning and problem posing:* How do you know? Have a questioning attitude; know what data are needed and develop questioning strategies to produce those data. Find problems to solve.

8. *Applying past knowledge to new situations:* Use what you learn. Access prior knowledge; transfer knowledge beyond the situation in which it was learned.

9. *Thinking and communicating with clarity and precision:* Be clear. Strive for accurate communication in both written and oral form; avoid over generalizations, distortions, deletions and exaggerations.

10. *Gather data through all senses:* Use your natural pathways. Pay attention to the world around you. Gather data through all the senses; taste, touch, smell, hearing and sight.

11. *Creating, imagining, and innovating:* Try a different way. Generate new and novel ideas, fluency, and originality.

12. *Responding with wonderment and awe:* Have fun figuring it out. Find the world awesome, mysterious and be intrigued with phenomena and beauty.

13. *Taking responsible risks:* Venture out. Be adventuresome; live on the edge of one's competence. Try new things constantly.

14. *Finding humor:* Laugh. Find the whimsical, incongruous and unexpected. Be able to laugh at oneself.

15. *Thinking interdependently:* Work together. Be able to work in and learn from others in reciprocal situations. Be a team player.

16. *Remaining open to continuous learning:* Embrace having more to learn. Have humility and pride when admitting you don't know; resist complacency.

(Costa & Kallick, 2000)

APPENDIX C: FACULTY AND PEER TUTOR PARTICIPANT INFORMED

CONSENT FORM

You are invited to participate in a study aimed at identifying promising practices for embedded remediation in CTE courses at this college. The researcher is Donna Cooper, a doctoral candidate in the Doctoral Program in Educational Leadership, California State University, Fresno. The title of the dissertation is "Exploring Embedded Remediation in Community College Career Technical Education Pathways: Promising Practices."

If you decide to participate in this study, you will be asked to answer questions in an individual, audio taped interview lasting approximately 1 hour. You will be asked a series of questions about your experience in implementing embedded remediation practices in a Career Technical Education Pathway at your college. A transcript of the interview will be provided and you will have the option of making changes or adjustments to your comments.

Any information obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. Any information provided throughout the study will be stored in a secure location accessible solely to the researcher, Donna Cooper.

The results of this study may be published or otherwise reported to scientific bodies. Your identity and the identity of this institution will remain confidential. You will receive no form of compensation for your participation in this study. Your decision whether or not to participate will not prejudice your future relations with California State University, Fresno. If you decide to

participate, you are free to withdraw your consent and to discontinue participation at any time without penalty. If you decide to withdraw from this study at any time before its completion, you must contact the researcher, Donna Cooper. The committee on the Protection of Human Subjects at California State University, Fresno has reviewed and approved the present research. Both the researcher and the participant will receive a copy of this informed consent form.

Should you have additional questions or require additional information please contact the researcher: Donna Cooper, Fresno City College, 1101 E University Ave. Fresno, CA 93741; (xxx) xxx-xxxx; or E-mail donna.cooper@fresnocitycollege.edu

Concerns not addressed by the researcher can be forwarded to: Dr. Diane Oliver, CSU Fresno, 5005 North Maple Avenue (M/S Ed303), Fresno, CA 93740-8025. Phone (xxx) xxx-xxxx or E-mail: doliver@csufresno.edu.

Questions regarding the rights of research subjects may be directed to Dr. Constance Jones, Chair, CSUF Committee on the Protection of Human Subjects, (xxx) xxx-xxxx.

You are making a decision whether or not to participate. Your signature indicates that you have decided to participate having read the information provided above.

_____ (Signature) _____ (Date)
    Researcher

_____ (Signature) _____ (Date)
    Participant

Note: The title of the dissertation was later revised to more accurately reflect the nature of the research.

APPENDIX D: FACULTY INTERVIEW QUESTIONS

1. What career path do you teach and what level of basic skills do you address in your course or program?

2. How would you describe your embedded program or lessons to other educators who might not be familiar with embedded remediation?

3. How did you get involved in embedded remediation as a faculty member?

4. What types of embedded remediation instructional strategies have you implemented?

5. How have you redesigned your career pathway to embed remediation?

6. How do you feel about the overall effectiveness of remediation?

7. What do you see as challenges of embedded remediation?

8. What conditions on your campus support or inhibit your practice?

9. What type of professional development or faculty training have you received in the area of embedded remediation?

10. Do you think that embedded remediation has affected student learning, completion and preparation for employment? Please explain.

11. How do you think your students perceive embedded remediation in relation to their learning?

12. Do you have any recommendations for colleagues about how to embed remediation in CTE programs?

APPENDIX E: PEER TUTOR INTERVIEW QUESTIONS

1. What career path are you a tutor in?

2. Are you familiar with the term embedded remediation?

3. Please describe your role as a tutor in this program?

4. How did you get involved as a tutor for this career pathway?

5. What types of instructional strategies do you use during your tutoring sessions?

6. How has the faculty member you work with redesigned their classroom instruction in order to embed remediation?

7. How do you feel about the overall effectiveness of peer tutoring?

8. What do you see as challenges of peer tutoring?

9. What do faculty and administration do at your campus to support or inhibit your role as a tutor?

10. What type of training have you received to be a tutor and to work in a CTE program?

11. Do you think that peer tutoring has affected student learning, completion and preparation for employment? Please explain.

12. How do you think the students perceive the tutoring in relation to their learning?

13. Do you have any recommendations for tutors or faculty about how to embed remediation in CTE programs?

APPENDIX F: INTERVIEW PROTOCOL

1. Introductions

2. Confirm permission to digitally record the interview

3. Informed consent form (make sure both parties sign and receive a copy)

4. Interview questions

5. Any concluding thoughts

6. Make sure participants have all of my contact information

7. Thank participant for their participation

APPENDIX G: FOCUS GROUP PARTICIPANT INFORMED
CONSENT FORM

You are invited to participate in a study aimed at identifying a model for embedded remediation in CTE courses at this college. The researcher is Donna Cooper, a doctoral candidate in the Doctoral Program in Educational Leadership, California State University, Fresno. The title of the dissertation is "Exploring Embedded Remediation in Community College Career Technical Education Pathways: Promising Practices."

If you decide to participate in this study, you will be asked to answer questions in an audio taped group discussion lasting approximately 90 minutes. You will be asked a series of questions about your experience in your career classes at your college.

Any information obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. Any information provided throughout the study will be stored in a secure location accessible solely to the researcher, Donna Cooper.

The results of this study may be published or otherwise reported to scientific bodies. Your identity and the identity of this institution will remain confidential. You will receive no form of compensation for your participation in this study. Your decision whether or not to participate will not prejudice your future relations with California State University, Fresno. If you decide to participate, you are free to withdraw your consent and to discontinue participation at any time without penalty. If you decide to withdraw from this study at any time

before its completion, you must contact the researcher, Donna Cooper. The committee on the Protection of Human Subjects at California State University, Fresno has reviewed and approved the present research. Both the researcher and the participant will receive a copy of this informed consent form.

Should you have additional questions or require additional information please contact the researcher: Donna Cooper, Fresno City College, 1101 E University Ave. Fresno, CA 93741; (xxx) xxx-xxxx; or E-mail donna.cooper@fresnocitycollege.edu

Concerns not addressed by the researcher can be forwarded to: Dr. Diane Oliver, CSU Fresno, 5005 North Maple Avenue (M/S Ed303), Fresno, CA 93740-8025. Phone (xxx) xxx-xxxx or E-mail: doliver@csufresno.edu.

Questions regarding the rights of research subjects may be directed to Dr. Constance Jones, Chair, CSUF Committee on the Protection of Human Subjects, (xxx) xxx-xxxx.

You are making a decision whether or not to participate. Your signature indicates that you have decided to participate having read the information provided above.

_____ (Signature) _____ (Date)
Researcher

_____ (Signature) _____ (Date)
Participant

Note: The title of the dissertation was later revised to more accurately reflect the nature of the research.

APPENDIX H: FOCUS GROUP PROTOCOL

1. Introductions

2. Provide a brief overview of the Consortium Initiative and define embedded remediation

3. Confirm permission to digitally record the focus group and ask students to state their name prior to answering questions.

4. Informed consent form (make sure both parties sign and receive a copy).

5. Focus group questions

6. Any concluding thoughts

7. Make sure participants have all of my contact information

8. Thank participant for their participation

APPENDIX I: FOCUS GROUP QUESTIONS

1. What program of study are you in and why did you select that program?

2. What have you liked the most about your classes in the program?

3. What have you liked least about the classes in your program of study?

4. How has reading and writing been taught in your program of study?

5. How has math been taught in your program of study?

6. From your point of view, how do these courses fit into your career pathway?

7. What activities or strategies did your instructor use that you thought helped you understand the material better?
   a. Tutor
   b. English teacher
   c. Math teacher
   d. Reading strategies
   e. Study skills strategies

8. How often do you think your program or instructor utilized activities or strategies that you thought helped you understand the material better?

9. What activities or strategies didn't work well in helping you understand the material better?

10. How has having a tutor helped you in your classes?

11. If we were going to make changes in the program what recommendations would you give us that would help students be successful?

APPENDIX J: OBSERVATION PROTOCOL

Observation #1

1. Review protocol with the classroom instructor prior to observing the class.

2. Be introduced to the class by the instructor and explain my purpose in visiting the class.

3. Sit in back of class or other unobtrusive location to observe the classroom.

4. Take field notes.

5. Thank the class and instructor for allowing me to observe the classroom.

Observation #2

1. Review protocol with the classroom instructor prior to observing the class.

2. Greet class and remind students of my purpose for observing.

3. Sit in back of class or other unobtrusive location to observe the classroom.

4. Take field notes

5. Thank the class and instructor for allowing me to observe the classroom.