

**“Goin’ Somewhere”:  
How Career Technical Education Programs Support and Constrain  
Urban Youths’ Career Decision-Making**

**Amy E. Ryken**

*University of Puget Sound*

**Abstract**

*This study analyzes urban youths’ career decision-making in a career and technical education program that provided work-based learning experiences and a pathway linking high school, community college, and work in biotechnology laboratories. The program provided work experiences not generally available to adolescents, and enabled students underrepresented in the sciences to experience and envision a scientific career. Case studies reveal tensions in students’ career decision-making as they gained knowledge/skills and kept career and educational options open; students saw increasing options for their future and the limits of program experiences. Students should be supported to take on active roles and to shape educational and career programs to fit their unique goals.*

New vocational education works to balance the tension between providing students with job-specific experiences while also exposing them to the breadth of options in the field (Grubb, 1996). Balancing this tension is a significant challenge, as evidence has shown that skills learned in internships are often not integrated with a broader sense of work organization or an occupation (Bailey, Hughes, & Moore, 2004). In this paper, the analysis of a best practice biotechnology-focused career and technical education (CTE) program reveals how one program balances the tension between providing broad options versus specific training.

**Aligning Educational and Occupational Goals**

Researchers have suggested that CTE reforms can lead to changes in pedagogy and content (Bailey et al., 2004; Grubb 1996; Urquiola, Stern, Horn, Dornsife, Chi, Williams, Merritt, Hughes, & Bailey, 1997). Students who have participated in programs that link high school, college and work have the opportunity to participate in a community of practice, where instruction is personalized through sustained, caring interactions with peers, teachers, and employers. In addition, students who have been engaged in active pedagogy with hands-on experiences in labs and classes can apply school learning to work site responsibilities (Crain, Allen, Thaler, Sullivan, Zellman, Warren Little, & Quigley, 1999; Grubb, Badway, Bell, Kraskouskas, 1996;

Moore, 1999; Stern, Raby, & Dayton, 1992). Through these experiences, participating students have had opportunities to build particular skills (e.g., technical, personal and social competence) as well as gain knowledge of the labor market and potential career pathways (Grubb et al., 1996; Hamilton & Hamilton, 1997; Schneider & Stevenson, 1999). Aligning educational and career ambitions is a key goal of CTE.

Adolescents with aligned ambitions have complementary educational and occupational goals, those with misaligned ambitions have goals that are not realistically connected to a particular occupation (e.g., they may overestimate or underestimate the amount of education needed). Those with aligned ambitions “see life events as sequentially organized” (Schneider & Stevenson, 1999, p. 85) and are more likely to strategically plan their actions to reach their goals. Defining an educational and career pathway for high school and college students, one that links high school, college, and work, makes a pathway explicit for students, enables them to experience career options, and supports their decision-making (Ryken, 2006).

CTE programs are designed with the intent to help students align educational and occupational goals and are inclusive of initiatives such as Tech Prep, work-based learning, and school-to-career. Tech Prep initiatives are different from conventional vocational education in that the focus is on applied academics, articulation with college, workplace experiences, career pathways, and includes students of a variety of backgrounds and ability levels (Bragg, Puckett, Reger, Thomas, Ortman, & Dornsife, 1997), whereas conventional vocational education typically did not provide the academic background for, or connections to, college programs. Initiatives involving work-based learning include apprenticeships, internships, cooperative education, service learning, volunteer work, school-based enterprises, and visits to employers. Advocates of work-based learning have emphasized the importance of learning skills in the context in which they will be used (Bailey, et al., 2004). More recently, school-to-career initiatives have focused on connecting school-based and work-based learning, articulating high school and college courses, and providing workplace experiences (Urquiola et al., 1997). Compared to these experiential career development activities, many career guidance interventions (e.g., career interest inventories) have been inauthentic (Hughes & Karp, 2004).

Within all of these initiatives, career development interventions that have focused on specific career skills have been more effective than those that have concentrated on general career preparation (Hughes & Karp, 2004). Organizing instruction with an occupational focus has helped to integrate the normally disconnected course offerings found in comprehensive high schools and community colleges around a theme, making career pathways visible, supporting academic and career planning, and emphasizing relationships between school and work (Grubb, 1996; Hughes, Bailey & Mechur, 2001; National Research Council & Institute of Medicine, 2004, chap. 7; Stern, Raby, & Dayton, 1992). CTE programs have helped students develop life plans and integrate curricular experiences. They have created

learning communities of teachers and students, utilized co-enrollment, and recognized work places as potential learning sites (Bragg et al., 1997; Castellano, Stringfield, & Stone, 2003; Conchas & Clark, 2002; Grubb, 1996; Pedraza, Pauly, & Kopp, 1997; Stasz & Kaganoff, 1997). While developing a career identity and an understanding of a particular labor market are not common practices in high school, within these programs work-based learning experiences assisted students in establishing a career identity and gaining labor market knowledge related to a specific occupational area (Stasz & Kaganoff, 1997).

### **Conceptual Framework: Supports and Constraints**

Aligned ambitions, in the context of participation in a CTE program, both propel and inhibit educational and career trajectories. Or, as one student participant of a school-to-career program aptly observed, "You can't be goin' somewhere later if you aren't goin' somewhere now." This statement reflects the tension in structured academic and vocational programs, which both support and constrain career decision-making. While the student emphasized the importance of having experiences that connect to future opportunities, the use of the term "somewhere" reveals the constraining nature of decision-making within a program structure; where is the "somewhere" that he is going to, and is there only one "somewhere?" Every program's sanctioned destination provides a career destination that does not fit all participants. There is a tension between helping students prepare for employment and keeping their career and educational options open (Simon & Dipppo, 1987).

One problem of conventional vocation education has been that it provides preparation for specific entry-level jobs, but not preparation for more advanced jobs or life-long careers (Grubb, 1996). Some researchers have argued that school-to-career programs fragment high school curriculum and may not prepare students academically for demanding 4-year colleges (Kantor, 1994). Furthermore, the evidence of barriers to linking high school and 4-year institutions includes the narrow focus on particular occupations and the academic rigor of the college courses. Students in CTE programs may have taken course work aligned with a particular job, rather than a disciplinary area. In addition, they may not have experienced academically rigorous programs in high school (Urquiola et al., 1997).

Rather than focusing on academic areas of study, recent educational reform and workplace development initiatives have emphasized learning in context or teaching skills in the environments in which they will be used (Belfiore, Defoe, Folinsbee, Hunter, & Jackson, 2004; Hughes, et al., 2001). Work-based learning initiatives have contributed to youth development by providing opportunities for students to learn about themselves and their interests, and encouraging students to "think in new ways not generally available to them in school classrooms" (Bailey, et al., 2004, p. 151); for example, they define problems, work in groups, and access the physical and social resources of the workplace. Students who have obtained jobs

through school-to-work programs have access to a variety of workplaces, receive training and feedback about their work performance, and are provided access to meaningful career paths (Bailey, et al., 2004).

Comprehensive developmental models for school-based career counseling have suggested that guidance be framed as “a structured program, not an individual-level process” offered by a counselor (Hughes & Karp, 2004, p. 6); for example, School-to-Work Opportunities Act reforms focused on academic curriculum rather than the involvement of career counselors. Guidance and academic counseling activities provided by counselors have included comprehensive guidance programs, career courses, counseling interventions, and computer-assisted guidance. A recent review of school-based career development research found that high school counselors spend their time split between scheduling courses, college admissions, and student attendance and discipline, and thus have limited time to assist students with career planning (Hughes & Karp, 2004). People underrepresented in the sciences often need support systems in order to pursue scientific or engineering careers (Mau, 2003). CTE programs are one way to create a structural experience, or support system, for career guidance where the focus of reform shifts from individual interventions to programs as interventions.

### **Research Questions**

This investigation focused on how students perceive the supports and constraints of a CTE program and analyzed the students’ educational and career decision-making. The central image that informs this work is that of students progressing on a career pathway. Getting on a path leads to particular outcomes (e.g., entrance to college, and/or finding a job in biotechnology). The path broadens as students have opportunities to gain laboratory skills, and scientific knowledge, and learn about careers in biotechnology. Supporting the progression on the pathway are the students themselves, by taking active roles in their own education, and the community of peers, teachers, and employers that offer help and guidance. This paper considers the following questions:

- How does the program balance the tension between providing broad options versus specific training? How do program structures support and constrain students’ educational and career progression?
- How do students perceive the relationships between high school, college, and work? How do students support their own educational and career development?

### **Case Study Method: Focus on Student Experiences**

In this inquiry, a case study method was used to examine how students experience challenges and opportunities as they make the transition from high school to college. Researchers have rarely studied how work-based learning experiences

enhance or inhibit students' academic and occupational development or how students experience work-based learning (Stasz & Kaganoff, 1997). Students are important actors with unique points of view about CTE programs; as Erickson (1986) noted, researchers should focus on the "immediate and local meanings of actions, as defined from the actors' point of view" (p. 119).

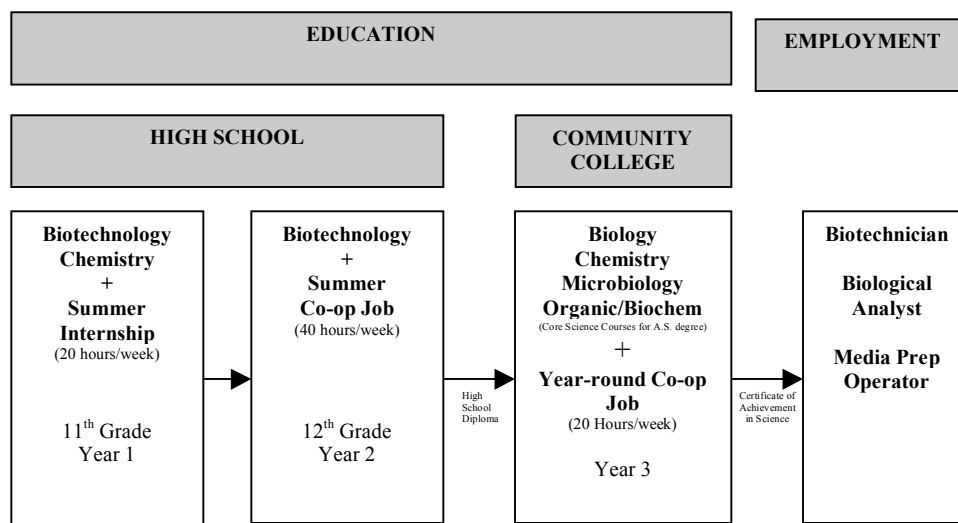
In fact, student perspectives may be very different from those of educators and employers. Bragg (1997) asked students, employers, and educators to sort statements about desired Tech Prep outcomes. She found that students sorted the outcome statements quite differently than teachers and supervisors. Students attributed greater value to educational outcomes (e.g., graduating from high school, advancing to college) and work skills (e.g., personal initiative, using technology and information), rather than academic outcomes, especially in math and science.

Case studies are especially well suited to investigations that examine contextual conditions (Yin, 1994). In this study, student participants are "an embedded unit of analysis" (Yin, 1993, p. 83) within the case of a best practice CTE program; thus, student experiences are "a particular phenomenon" and the CTE program is "the *context* [italics added] within which the phenomenon is occurring" (Yin, 1993, p. 31). Studying multiple cases was undertaken with the aim ". . . to see processes and outcomes across many cases, to understand how they are qualified by local conditions. . ." (Miles & Huberman, 1994, p. 172).

### **Research Site**

At the research site, students participated in a coherent sequence of work-based and school-based learning activities, including science course work during two years of high school and one year of community college, paid summer internships as high school students, and paid year-round co-op jobs as community college students. The population studied over seven years was a group of 256 students participating in a biotechnology CTE program that linked two high school career academies, one community college, and over 40 biotechnology laboratories in the San Francisco Bay Area. Figure 1 summarizes key experiences in the core program. This pathway is simultaneously rigid (core requirements) and fluid (multiple exit and entry points, enabling students to use the pathway differently).

Figure 1: *Program Pathway*



Program participation was voluntary and targeted to ethnically and linguistically diverse students who may not have otherwise had access to either the community college environment or biotechnology laboratory settings. Fifty-three (53.6%) percent of program participants were African American, 21.6% Latino/a, 16.5% Asian, and 8.1% White. Women and men were equally represented. Over 50% of students were the first in their family to graduate from high school and over 80% were the first in their family to be enrolled in a post-secondary program.

Analysis of student participation in the program revealed that over 50% of community college entrants completed the biotechnology certificate and that internships and co-op jobs were an important factor in community college retention and completion (Ryken, 2004). In contrast, a study of the sub-baccalaureate labor market, which includes three-fifths of all workers in the United States (including those with a high school diploma or “some college,” but not a bachelor’s degree) found that only 30% of community college entrants seeking a degree/certificate earn sub-baccalaureate credentials and that 50% drop out without completing any credentials (Grubb, 1996).

### Case Study Design: Replication Logic

As shown in Table 1, this case study was organized using cross-case replication logic where cases were intentionally selected to mirror similar

intervention conditions. Yin (1993) emphasizes that “Multiple-case studies should follow a replication, not sampling logic. This means that two or more cases should be included precisely because the investigator predicts that similar results (replications) will be found” (p. 36). The experiences of three students are situated within the larger research study of 256 participants to demonstrate that the analysis and interpretations presented are based on a cross-case analysis of 61 student participants, and thus the cases are not unusual or unique (except that they are individuals’ experiences), but instead reflect the patterns and trends discovered in the larger study.

Table 1: *Case Study Replication Logic*

Unit of Analysis: Biotechnology CTE Program		
<b>Research Questions Relating to Program</b> <ul style="list-style-type: none"> <li>How is the occupational focus of the program articulated and organized? Does the focus emphasize connections to both college and work?</li> <li>How does the program balance the tension between providing broad options versus specific training?</li> <li>How do program structures support and constrain students’ educational and career progression?</li> </ul>		
Number of Students	Replication Logic <sup>1</sup>	Data Sources
256	Best Practice Program. No comparison case at program level of analysis.	Program documents (e.g., program descriptions, curriculum material, mission statement). Analysis of company participation in work experiences by company type.
Embedded Unit of Analysis: Student Participants		
<b>Research Questions Relating to Student Experiences</b> <ul style="list-style-type: none"> <li>How do students perceive the relationships between high school, college and work?</li> <li>How do students support their own educational and career development?</li> </ul>		
Number of Students	Replication Logic	Data Sources
256	All participants.	Longitudinal cohort analyses, calculating persistence and attrition rates for nine cohorts.
61	Representative percentages, based on cohort analysis, of students who had gone to a 2-year or 4-year college, those who completed the community college biotechnology certificate, and those who had dropped out.	Program Files: program application, applications for internships and co-op jobs, written learning objectives, supervisors’ ratings, written co-op papers, community college applications and resumes.
22	Students who had gone to a 2-year or 4-year college, those who completed the community college biotechnology certificate or were still enrolled, and those who dropped out.	Interview: Interview guides focused on experiences in community college and high school, co-op jobs and internships, and structures that helped students complete the program.
3	Three African American female students who entered the community	All data sources listed above.

<sup>1</sup> Identifying similar and different intervention conditions

	college program and reached different career and educational destinations.	
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Table 1 summarizes the research design and data sources used, emphasizing the logic used at each phase of data collection, and demonstrating a comprehensive research strategy that included program document analysis, quantitative cohort analysis of all 256 student participants, file analysis of 61 of the participants, and interviews with 22 students whose files were analyzed. Different research questions and instruments were used for each unit of analysis; Table 1 reflects the use of Yin's (1993) suggestion that "when embedded case designs are used, different research questions and instruments are needed for each unit of analysis" (p. 33). Program files contained important student employment and academic documents: internship and co-op job applications, written learning objectives, supervisors' ratings, written co-op papers, community college applications and resumes. Each interview was approximately one hour long, directed by interview guides covering topics related to experiences in community college and high school, co-op jobs and internships, relationships between school and work, and structures that helped students complete the program.

Because African American women are underrepresented in the sciences (National Science Foundation, 2000) and more than half of the program participants were African American, the experiences of three African American female students are used to illustrate patterns found in the cross-case analysis of the 61 focal students. Selection of the profiled students was based on their completion of program milestones. Note that Table 1 situates data collected about three students within a broader research design framework. The three students' experiences reflect similar intervention conditions, but different final career and educational outcomes; one graduated from the program and took a job in a biotechnology laboratory, one graduated and did not take a full-time job in an effort to continue her college education, and one dropped out because the program did not support her career interests. These different outcomes highlight how program participants navigated the tensions between specific career training versus seeking educational and career options.

The data sources are unusually comprehensive in that they represent program participation over a three to six year period for each student, across three diverse settings—high school, community college and work. The data sources provide detailed evidence about how students make decisions to continue (or not) on an educational and career pathway.

### **Data Analysis and Interpretation**

The role of work-based experiences in retention (Ryken, 2004) and the importance of flexible entry and exit points to meet students' needs (Ryken, 2006), have been examined elsewhere. Because the concept of using educational and career pathways as structural career guidance is central to CTE, the goal of this particular



analysis is to investigate and make visible the details of students' educational and career decision-making within the context of a program pathway.

Miles and Huberman (1994) recommend data reduction, display, and verification, and accordingly, the file analysis began with organizing materials chronologically to understand each student's educational and career decision-making over time. After completing the initial inventory, each file was read again and notations were made about common themes. During this initial coding, the themes included: social support, career and educational goals, high school versus college, work versus school, expectations, industry knowledge, equipment/instruments, combining theory and practice, communication/language, time, motivating factors, and future plans. Those themes were then consolidated into four major categories/codes: 1) Skill Building, 2) Career Pathway, 3) Relationship Building, and 4) Youth Participation. Table 2 shows the relationship of the initial codes to the final four consolidated codes. The consolidated codes were consistent with research findings about important elements of youth development programs (Benson & Saito, 2000).

Table 2: *Case Study Analytical Coding*

<b>Initial Coding</b>	<b>Consolidated Codes</b>
high school vs. college work vs. school equipment/instruments combining theory and practice	Skill Building
career and educational goals industry knowledge future plans	Career Pathway
social support high school vs. college work vs. school expectations motivating factors	Relationship Building
high school vs. college work vs. school communication/language time	Youth Participation

Interview transcripts were analyzed using the coding scheme to verify findings in the file analysis. Twenty-three percent (5/22) of the student files, including interview transcripts, were coded by colleagues to verify codes thorough “intersubjective consensus” (Miles and Hubberman, 1994, p. 11). In addition, these themes were double checked and verified with program staff and student participants. The Career Pathway coding category (the focus of this analysis) included information on the variety of ways that students used the program structures, and resources outside program experiences, to meet their goals.

In case study construction, researchers are “. . . writers who construct others’ lives” (Dyson, 1995, p. 4) who “. . . *can* work to make another’s life world more perceptible, more accessible, by respecting the details of that world . . .” (p. 5). Because language is an important mediating factor in all learning contexts (Cazden, 2001; Gee, 1999; Heath, 1983), quotes from written documents and student interviews appear as written or spoken, even if in non-standard English. Students’ written and spoken language communicated that they understood the program pathway and had goals, and demonstrated their excitement about and ability to reflect on experiences. Although readers may perceive that the students did not possess the necessary language skills for college or employment, in fact all three of these students experienced success in both the school and work components of the program. The direct quotations enable readers to hear directly from students the ways in which students utilized the program to support and shape their own goals. Secondly, readers are encouraged to ponder questions such as: What communication skills are *really* necessary for success in school and work? Do student language patterns change over time?

### **Career Development of Three Students**

Careers can be conceptualized “as self-realization, growing experiences, and context conceptualization” (Chen, 2003, p. 203). In the context of the CTE program studied, there is evidence of students’ learning about themselves and their interests, gaining experiences in college and biotechnology laboratory settings, and a complex set of interrelationships between students’ backgrounds, interpersonal relationships, and labor market demands. As students progressed through the biotechnology program their career plans became more articulated and specific. While they indicated that the program pathway helped them look at educational and career options, each student was on her *own* pathway, utilizing the program in an effort to reach her goals.

Because the program pathway was not an endpoint, but a coherent sequence of experiences that students used differently, it is essential to understand how students made choices within the structure of the program. In all case study research “we are faced with the tension between the particular and the universal: reconciling an individual case’s uniqueness with the need for more general understanding of generic

processes that occur across cases” (Miles & Huberman, 1994, p. 173). By presenting an “individual’s developmental history over time” (p. 173) the cases represent *both* the uniqueness of the case *and* the larger patterns in the program; “case-oriented analysis is good at finding specific, concrete, historically-grounded patterns. . .” (p. 174).

The following section includes portraits of three African American female students who utilized the structured academic and vocational pathway in different ways. These cases are summarized in Table 3 and were selected to demonstrate the range of student experiences within one program and reflect the patterns found in the cross-case analysis of 61 students’ experiences. The tension between the program’s supporting and constraining roles, as well as the consequences for individual students, is seen in each portrait.

Table 3: *Summary of Students’ Trajectories*

Student	How Student Used Pathway	Educational & Career Outcomes	Tensions Illustrated by Case
Antionette	Prepared for skilled-technical job (as the program pathway is designed)	Earned certificate, hired into full-time job	Individual career goals vs. program pathway  Finding challenging work
Latasha	Prepared for 4-year college	Earned certificate, continued taking transfer course work	Individual career goals vs. program pathway  Defining meaningful work (job vs. career)
Antisha	Clarified career goal	Dropped out of program and community college	Individual career goals vs. program pathway  Finding non-curricular supports

### **Antoinette: Creating Learning Opportunities by Asking Questions**

Antionette graduated from the program and was hired by a biotechnology laboratory. This portrait illustrates how internships and co-op jobs give meaning to school course work and allow students to shape their own learning within work settings.

Antoinette is the youngest child in her family and the first of her six brothers and sisters to go to college. Only she and one other sister graduated from high school. She participated in an internship during the summer between 11<sup>th</sup> and 12<sup>th</sup> grade, and had a co-op job her first year of college. On the summer internship application completed when she was an 11<sup>th</sup> grader, Antoinette highlighted her desire to gain work experience and apply lab skills she had learned in school with her long-term interest in a career as a biologist.

I would like to participate in the internship program because I want to have more work experience and to apply my lab skills toward a job, and my long term goals is to become a researcher biologist.

That summer she worked in a government laboratory. Her primary responsibility was data entry for a water sample database. In reflecting about her internship she wrote,

In thinking about my internship here it made me want to make sure I will always perform my best at all times, ask my supervisor many questions so I can understand and grow with my days here and maybe see or even learn how they take a sample from the water and learn what types of instruments they used and last but not least to maybe even observed in the lab of when they test the samples of water.

On the job at the internship, by expressing her desire to learn lab skills Antionette directed her own learning experiences. Her supervisor wrote on the intern performance evaluation, “Antoinette requests to gain skills in analytical techniques by observing and practicing work in the main lab.” Through her internship, Antoinette had had the opportunity to work in a laboratory and became interested in the sampling procedures and instruments used to test water quality. By asking questions and repeatedly expressing a desire to apply her laboratory skills, she shaped her internship into a rich learning experience. Here a complex set of factors was at work—Antionette’s effort to ask questions, a supervisor attentive to Antionette’s questions, and a laboratory context with particular instruments to support Antionette’s learning goals.

Two years later, when she began taking community college classes, Antionette worked in a co-op job as a laboratory assistant at a large biotechnology production facility. She recognized the critical role played by the co-op job in helping her understand the scientific concepts covered in the community college courses and textbooks.

This program gives you the curriculum and work experience all at once. I feel it is harder to understand material by just reading because I feel when you are able to read the material with hands on experience with the material you grasp,

and remember things a lot better; everything began to come to me like second nature.

While on the co-op job site, Antoinette once again shaped her own learning experiences by asking questions and asking for additional responsibilities and more challenging work.

By the third or fourth month of my co-op job curiosity began to build in me more and more because I always felt that internship is about learning as much as you can while being there. So I began to ask the lab technicians about how I could learn more what they were doing. The great thing about it is that they did let me do more things and that's only because I asked and kept on asking until they made the time for me to learn how to do it.

In reflecting on her school and work experiences, Antoinette emphasized the role of teachers and co-workers as supports.

I love the people to death in my lab, they're totally cool. You feel more comfortable, it makes it easier when you have a teacher you could talk to, 'Well I didn't have a good weekend this weekend because this and this happened and I was really upset about it.' You can talk to them about things that happened and you can talk to them about your goals and your dreams, to let them know you. I think it's important to have a nice strong relationship with your teachers and your co-workers at work.

When Antoinette graduated from the program she began a job as a media operator at large biotechnology manufacturing facility, earning \$16.57 per hour<sup>2</sup>. Her experiences illustrate how internships and co-op jobs provide students access to scientific knowledge and skills, allowing students to connect work and school learning to their interests, and supporting their own progression on a career pathway. In both her internship and co-op job Antionette asked questions and asked for additional laboratory-related responsibilities. She also recognized the role teachers and co-workers play in helping students meet the challenges of life, college, work, and making plans for the future. All of these factors are evidence of the ways in which Antionette used program experiences to support her career decision-making.

On the other hand, the particular types of instruments used, and work contexts experienced (e.g., government laboratory and biotechnology production facility), constrained Antoinette's vision of other options. Although it is clear that her experiences in the workplace helped her understand scientific material covered in college courses, it is less clear how these experiences related to her stated goal to become a "researcher biologist." Additionally, there was no mechanism in the

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<sup>2</sup> An hourly wage three times the federal minimum wage for that year (\$5.15); equivalent to an annual salary of \$34,000.

program for her to go on to a 4-year college for the degrees necessary for a research career.

### **Latasha: Seeing Beyond the Limits of the Program**

Latasha graduated from the program and did not take a full-time laboratory job in an effort to continue her college education. This portrait illustrates how students see beyond the limits of programs and envision multiple options for their future.

Latasha lived with her mother and younger brother and had two sisters attending college. She had a summer internship in a hospital research laboratory and completed the college certificate while working in a co-op job at a government laboratory, then, after earning the certificate, decided to take a part-time entry-level position (rather than a full-time position) at an agricultural research facility. She chose a part-time job so that she could attend community college as a full-time student in order to complete general education requirements for transfer to a 4-year college.

On her application to enter the program in the 11<sup>th</sup> grade, Latasha gave a rather flippant one sentence response to the question, “Why do you want to be in the biotech academy?” She wrote, “I want to play with DNA and design my own virus.” Her focus was not on a particular career future, but instead on a particular scientific interest.

Two years later, in a paper about her co-op job in a state crime laboratory, Latasha wrote about the differences between a job and a career. She clearly articulated a career was something she would need to enjoy doing, and that she did not have passion for forensics. Cataloging DNA samples of convicted felons was not of interest because she was troubled by the origins of the samples and what they reflected about society.

The difference between a job and a career is that jobs such as a bus driver are tools to survive, but a career is something that you enjoy doing and get paid to do it. I believe the Department of Justice cannot help me get a career because I would never have passion for the kind of work they have to offer me. I would always think in terms of why the databank receives so many samples and what that reflects about our ‘civilized society.’

Here Latasha defined, for herself, what career meant to her—having a passion for one’s work. She noted the complex factors that shaped the context of her work and described the relationships between society’s values and her own values.

Finally, in an interview conducted five months after Latasha earned the college certificate, she described why she decided to continue her education beyond the community college certificate. Her comments reflected a sophisticated understanding

of labor queues, where the least credentialed and last hired are often the first to be laid off.

The golden carrot is the money. Students see they can get a car, but they don't always know that it is more than a flash. Lab tech jobs are not secure if there are layoffs. You need to think about long-term job security, and about what companies will accept your certificates. Companies want to know what you know and what you can do coming in the door.

Latasha's descriptions of her own needs and interests became increasingly elaborated as she participated in high school course work, an internship, college course work, and a co-op job. The program pathway supported Latasha's efforts to formulate her own definition of meaningful work. Her experiences in the program allowed her to see the limits of the community college certificate and motivated her to continue college studies. Latasha's vision for her future was not constrained by the sanctioned program pathway. She decided to continue on the college educational path, even though it meant temporarily giving up a well paying, full-time job.

### **Antisha: I Want to Be a Mortician**

Antisha dropped out of the program shortly after beginning community college courses. This portrait illustrates the importance of matching student interests to program experiences.

As a high school student, Antisha ran track and was a cheerleader. She did not have a permanent home, and moved between the homes of two aunts about every six months. Antisha participated in an internship in high school but did not complete the co-op job she started.

During the first summer internship, Antisha's written reflections showed a strong sense of engagement in her work. Her internship in a hospital laboratory provided opportunities to see a working morgue and participate in autopsies; these experiences were consistent with her career goal to be a mortician. Her interest in the job gave her confidence to ask questions and fueled her desire to be a keen observer of the laboratory's activities.

I had seen a real autopsy on this old lady. Let me tell you what I learned doing the autopsy. It started like this, there was two ladies and me. We had to put on gowns, gloves, hats, shoes, face masks. And they got the tools. They put the body on the table and they cut an X by each shoulder and started down by her stomach after that they had took out all the organ that they need and they put everything back in and then stitched back up her bodies. That was the most interesting thing I had seen since I been at my job. The next day after that I learn how to go to this lady in the morgue and ask her questions about dead people. I saw and learned why was this baby girl was in there, and how two

white ladies was in there. It was quite interesting to see why people die, and where they are kept.

In 12<sup>th</sup> grade Antisha debated between attending a 4-year college or continuing on the program pathway to attend community college. Her goal at that time was, “To go to college and get a job being a mortician.” She filled out a co-op job application stating; “Last year I had got a good job from it. And it help me decide on the fields that I would want to be in.” Antisha emphasized that her internship experiences had helped her decide to become a mortician. Her application also emphasized a desire to attend a school where other students shared her career goals.

I am interested in being a program that has morticians school and has the same career goals as me. I would like to let you know this program has brought me a long ways. I hope to continue and stay in this program. I plan to go on in life and succeeded in my goals so I hope you will take heated in what I wrote.

Her comments suggested that although the program had helped her move along a pathway, it did not quite match her career aspirations. Four weeks after her co-op job in a biotechnology laboratory began in June, Antisha, without explanation, stopped reporting to work. After missing three weeks, she telephoned, hoping to return to work. Antisha’s supervisor informed her that she no longer had a job, feeling strongly that offering Antisha a chance to return would send the wrong message about the importance of communication and attendance in the workplace. Antisha decided to continue on with the community college program without a co-op job. However, when the fall semester began in September, she did not sign up for courses.

Antisha’s goal was to become a mortician. Although the hospital internship gave her the opportunity to participate in autopsies and observe how a morgue operated, she wanted to attend a college mortician training program. While Antisha’s internship in the hospital setting was closely aligned with and supported her interests, her co-op job, focused on biotechnology, did not provide the same opportunities or supports to explore those interests. In addition, the program, with its focus on biotechnology, did not match her career goals, and thus constrained her ability to reach those goals. Antisha’s experience emphasizes the importance of alignment between students’ needs and interests and program structures. The program supported her with one work-based experience that reflected her interests and constrained her by providing another experience that did not relate to her goals.

Other factors also influenced Antisha’s path. Her needs for a stable living arrangement were not addressed by the program and got in the way of her participation, despite her interest in continuing her studies at the college level. Tang (2003) notes that “career intervention programs are not sensitive to the restraints and resources in an individual’s environment” (p. 63). The program was unable to serve



as a safety net for whatever crisis Antisha experienced that prevented her attendance at her co-op job and thus, resulted in her losing her job and connection to the community college courses.

### **Career Decisions Tied to Work-based Learning Experiences**

The program studied enabled students underrepresented in the sciences to experience and envision a scientific career and discover their own career preferences. Students were supported on an educational and career pathway by having access to work experiences and a clear program that linked high school, college, and work. It is through their participation over a three-year period, in both science courses and scientific workplaces, that students saw increasing options for their future, as well as the limits of program experiences. Just as Tolley (2003) documented, for these students studying “science in college or deciding to become a professional scientist are decisions made only at the end of a far longer process, during which individuals subjectively qualify or disqualify themselves as suited to the field” (p. 148). Through work-based learning experiences and exposure to the community college environment, students gained the ability to envision a pathway beyond the community college certificate, to a degree, and beyond a laboratory job, to a career in science.

The range of student experiences reported in the case studies reveals that education/career decisions evolve over time and are tied to experiences in the labor market, and suggest that there is a complex interaction between students’ needs and interests and program structures. Consistent with Chen’s (2003) concept of career, students participating in CTE programs gain experiences, actively shape and are shaped by contextual factors, and learn about themselves. For example, Antionette actively shaped her learning experiences by asking questions, and Antisha confirmed her goal to become a mortician through her experiences in a hospital laboratory. The case studies demonstrate the tension between how programs support career decision-making by providing experiences that help students envision future career opportunities and constrain career decision-making by focusing on one progression of experiences. The findings suggest that an occupational focus should be envisioned as a life-long journey involving education and employment, rather than as participation in a short term program during the high school and college years (Hamilton & Hamilton, 1997; School-to-Work Task Force, 1999).

### **Implications**

The findings of this investigation have implications for both CTE programs and students. Using a “critical/reflective strategy” (Bailey, et al., 2004, p. 217) toward work experiences can help program designers, career counselors, and students

consider how programs both provide learning resources and limit career decision-making. Thus, the research questions that focused this study are important reflection questions for program designers and students to ask themselves.

### **Implications for Career Technical Education Programs**

While the aligned ambitions that CTE programs seek to foster can propel participants, the intended destination (career and educational) inhibits some because the “somewhere” is defined; a defined program pathway inherently rules out some options that might be better aligned with student interests. Programs that link school and work settings can provide resources to support long-term planning, but program designers should seek ways to help participants see multiple options for their futures. Additionally, students should be involved in ongoing discussions in which the costs and benefits of “goin’ somewhere” and program participation are considered.

School-based career development interventions typically focus on student knowledge and attitudes, rather than behaviors such as course taking or academic achievement (Hughes & Karp, 2004). These interventions are often organized around some perceived or identified labor market need (Grubb & Lazerson, 2004) and sometimes overemphasize the college admission process (Schneider & Stevenson, 1999). Fostering work experiences in adult work settings supports student growth by providing a network of supportive adults (Hughes, et al., 2001; National Research Council & Institute of Medicine, 2004, chap. 7) and emphasizes a team approach to career development (Hughes & Karp, 2004). As the case studies demonstrate, employers are uniquely situated to help students connect work experiences to educational and occupational goals. For example, Antionette’s work supervisor supported and encouraged Antionette’s biologist career goals by allowing her to work in the main laboratory.

Despite clear program pathways and multiple internship and co-op job experiences, there is an inherent tension within any program design. Program designers need to put options on the table for students, in both program promotion efforts and documentation. For example, visual diagrams of educational and career pathways should situate program experiences within a broader set of related educational and career options, including those beyond the prescribed program experiences. Raising questions about the limiting aspects of a program is one way to implement a critical/reflective strategy. Important reflection questions include:

- In what ways do work and educational experiences broaden students’ educational choices and progression? In what ways do those experiences constrain future choices?
- How is the tension between gaining knowledge/skills required for employment, and keeping career and education options open, addressed?

- Are students supported to seek pathways outside the sanctioned program?

Career development is enhanced by asking questions, volunteering for additional tasks, and articulating needs and interests. Students should be supported in their efforts to take on active roles and to align the educational and career pathway with their unique goals. Two important skills that CTE programs can emphasize are negotiating increasing responsibility with work supervisors and asking questions about how work-based learning experiences relate to students' own changing educational and career ambitions.

### **Implications for Students**

As revealed by this study, students are not passive recipients of information or program experiences, but rather are co-creators of their own knowledge. Students propel their own learning by asking questions and some students come to see the limits of program experiences by focusing on their own career goals, rather than a prescribed program pathway. For example, Latasha temporarily deferred taking a full-time job in order to continue her education (beyond the program pathway) at the community college.

Researchers have documented the “centrality of self in relation to learning” and the role of relationships as students consider questions such as, Who am I? Who am I becoming? (Thompson & Windschitl, 2002, p. 1). Work-based experiences provide students with a structured opportunity for self-evaluation by reviewing goals, plans and performance (Mithaug, 1994). For example, Antisha, in realizing that she really wanted to be a mortician rather than a biotechnician, found that the program pathway did not support her career goal. As the case studies demonstrate, all three students had career goals and used the program pathway to re-evaluate and further define their goals over time. In addition, they valued the network of adults who support their goals and efforts.

Students can take a critical/reflective stance toward their own educational and career development by asking themselves about the relationships between their goals, needs and program experiences:

- What do I want to learn from these experiences?
- Who do I hope to become? Will this program help me reach my goals?
- How does this program support my needs and interests? How does it not?
- How is my thinking about my future changing?

Students make the goals of CTE attainable in a number of ways: by negotiating in a variety of contexts (e.g., high school, college, and work); by shaping their own learning by asking questions; by making choices to spend their time engaged in activities that emphasize educational and career development; by linking school and work (by providing feedback to teachers and employers about their experiences in each setting); and finally, by viewing adults and peers as learning

resources and accessing allies who can provide academic and social support to reach educational and career goals.

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### **Author**

Amy E. Ryken is an Assistant Professor in the School of Education at the University of Puget Sound in Tacoma, WA. She teaches math and science education courses to elementary and secondary pre-service teachers. Her research interests include work-based learning, science education partnerships, and environmental education.

### **Author Note**

Holly A. Senn, Joseph Flessa, and three anonymous reviewers read evolving versions of this work, always providing supportive and insightful comments. University of California, Berkeley mentors W. Norton Grubb and David Stern supported my interest in studying the role of career academy experiences in student career development. University of Puget Sound colleagues Fred Hamel and Chris Kline supported my exploration of the tensions revealed by students' experiences.