CATEC
Strategic Planning & Design

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Bridgewater Innovations Group, LLC

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CATEC’s Vision Statement

CATEC, in partnership with PVCC and major employers, will serve as part of the regional training ladder across a range of CTE institutes designed to result in employability within regional businesses and to give access to continued post-secondary training.
# Table of Contents

Executive Summary ......................................................................................................................... 4
Introduction ................................................................................................................................. 5
  Bridgewater Innovations Group, LLC (the bridge ltd) Team Members ......................................... 5
  The Project Timeline .................................................................................................................. 6
  The Design Process .................................................................................................................... 6
    Research and investigation of the current landscape ............................................................... 6
    Determination of the need ......................................................................................................... 6
    Development of prototypes ...................................................................................................... 7
    Testing of prototypes with stakeholders .................................................................................. 7
    Selection of best model(s) ......................................................................................................... 7
    Proposal of phased plan ........................................................................................................... 7
The Current CATEC ...................................................................................................................... 7
Phase I Research .......................................................................................................................... 8
  Career and Technical Education – What it is and how it has evolved ....................................... 8
  Current and Future Workforce Trends ...................................................................................... 9
  The Global Perspective ............................................................................................................. 12
  Job Shortage or Skills Shortage? ............................................................................................... 13
  Workplace Readiness Skills for the Future .............................................................................. 13
  CTE – Significance, Barriers, Needs, and Promising Practices .............................................. 18
    Barrier: Attitudes/Perceptions/Engagement ........................................................................... 19
    Barrier: Lack of Effective, High-Quality CTE Programs ...................................................... 20
    What’s Needed ....................................................................................................................... 20
    Promising Practices .............................................................................................................. 20
    Some notable programs across the country: .......................................................................... 21
    Conclusions ............................................................................................................................ 22
Phase II and Phase III, Preliminary Model Development ................................................................. 22
  Preliminary Model Development ............................................................................................. 23
Current CATEC model ................................................................. 24
Characteristics of this model ....................................................... 24
CATEC Full-time model ............................................................. 25
Characteristics of this model ....................................................... 25
Centers of Excellence model ...................................................... 26
Characteristics of this model ....................................................... 26
Certification Center model .......................................................... 27
Characteristics of this model ....................................................... 27
Career Path Integration model .................................................... 28
Characteristics of this model ....................................................... 28
Do-It-Yourself model ................................................................. 29
Characteristics of this model ....................................................... 29
Gathering Input and Garnering Support ...................................... 30
The Institutes Model ................................................................. 31
The Institutes Model: Components and features .......................... 32
Steps to Implement the Institutes Model ....................................... 36
  Redefine role of CATEC director to focus strategic objectives. ........ 36
  Appoint a Public/Private steering group to oversee the change process (representatives from
  CATEC, PVCC, business, experts). .............................................. 36
  Decide the sequence of institute formation .................................. 36
  Establish/approve calendar of events ........................................ 36
  Establish Program Design Center .......................................... 36
  Approve the outline and process for institute proposal presentations. 36
  Approve budget for the detailed planning process ....................... 36
Organizing to Implement the Model .......................................... 37
Institute Planning ................................................................. 37
Samples of step-by-step Institute design .................................... 38
Institute Rollout ................................................................. 39
Other Questions ................................................................. 39
Executive Summary

This report presents the research and results from the Bridgewater Innovations Group, LLC (dba: the bridge, ltd) strategic planning and design project. The Charlottesville Albemarle Technical Education Center (CATEC) commissioned the bridge, ltd to conduct a strategic assessment of CATEC, carry out a process of discovery and design, and develop a final design incorporating the findings, recommendations, and implications from each stage of the process. The project team included Dr. Patty Culotta, Dr. Thomas Smith, Dr. Grant Tate, Ms. Jennifer Till and Mr. Kevin Willis.

The study comprised three phases over a six-month period. Phase I, research, examined the best practices in career and technical education; current and future work trends at the regional, national, and international levels; data on jobs and employment; and workplace skills requirements. Phase II built on Phase I results to determine characteristics of the ideal CATEC solution, identify strategic questions, develop preliminary models for stakeholder input, and design a comprehensive model. In Phase III, the comprehensive model, including a strategy for implementation, was presented to the CATEC Board.

The most salient findings of the Phase 1 research were: Methods of work, driven by innovation and accelerating knowledge generation, are in a state of flux, placing increased demands on employees’ skill and knowledge. This requires agile and work-ready employees and requires collaborative relationships between education centers and employers. Various studies suggest that our supply system is not equipped to meet the demands for workers with mid-level skills. Accordingly, opportunities for education and training to afford workers the necessary tools for successful 21st century careers are crucial. Career and technical education, in partnership with other educational/training organizations and with businesses, is a means of developing a well-aligned, skilled workforce.

The Phase I research, combined with stakeholder interviews, formed the foundation for redesign of CATEC in Phase II. The bridge ltd team developed several alternative models, took them to stakeholders and community leaders for review. This process, by its nature, helped generate awareness, engagement and enthusiasm across the community. Feedback and comments from the interviews helped form the final strategic model, the Institutes Model. The model includes five institutes: Customer Service, Skilled Trades, Manufacturing and Information Technology, Healthcare, and Early Childhood Education. In addition, the model includes a program design center and a skills assessment center. This model was presented to CATEC’s governing Board for initial review, followed by subsequent submission for approval. The Phase III process included timelines for Institutes planning and implementation.

The recommended Institutes Model builds on a strong collaboration between CATEC and PVCC. This means CATEC and PVCC, with additional collaboration with employers, will develop and implement the new model over the next five years. Ultimately the recommended model will reposition CATEC as a dynamic, progressive partner in the educational and workforce development community. The model requires collaborative efforts and leadership from CATEC, PVCC, their governing bodies, city and county executives, regional employers, and the community. Such a partnership will result in a significant force to develop an agile and well-aligned, adequately equipped workforce for the region.
Introduction

In August 2013, the Charlottesville Albemarle Technical Education Center (CATEC) contracted with Bridgewater Innovations Group, LLC (dba: the bridge, ltd) for the purpose of conducting Strategic Planning and Designing for CATEC. Specifically, Bridgewater Innovations Group, LLC will:

- Conduct a strategic assessment of all program areas, including a thorough review of existing materials and interviews with key stakeholders (staff, board members, partners, donors, program participants, volunteers, and beneficiaries).
- Conduct a three-stage process of strategic planning and designing to include:
  - **Discovery**: Discover state-of-the-art schooling practices related to Career and Technical Education and specific to regional technical education centers. (September-October, 2013)
  - **Design**: Design a state-of-the-art regional technical center that integrates community needs, stakeholder values, and highly effective teaching and learning practices while addressing community perceptions and school logistics. (November-December, 2013)
  - **Create**: Create a regional technical education center in partnership with the CATEC Center Board that incorporates the findings, recommendations, and implications, from each stage of the strategic planning and designing process. (January-February, 2014)

- Maintain regular contact with and prepare regular presentations for the CATEC Center board and the Joint School Boards of Albemarle County and Charlottesville City in accordance with established school board meeting schedules and ad-hoc meetings.
- Prepare a three-year strategic planning and design process for approval by the CATEC Center Board.

Bridgewater Innovations Group, LLC (the bridge ltd) Team Members

To address this project, the company assembled a team of experts with complementary backgrounds and capabilities: Education, training, strategic planning, operations, community service, industry relations and leadership.

Dr. Grant Tate  
Ms. Jennifer Till  
Mr. Kevin Willis  
Dr. Patty Culotta  
Dr. Thomas Smith
The Project Timeline

The team translated the project goals into the following timeline:

From the beginning, the team recognized that the project must have significant community and employer participation. Achieving consensus among all major stakeholder groups became a major goal of the work. Thus, the team developed a process that was open and involved a wide variety of participants.

The Design Process

The team used a modern innovative approach to problem solving and design called “Design Thinking,” a technique that counts Dr. Jeanne Litke of the Darden School among its proponents. The CATEC design process included the following steps:

Research and investigation of the current landscape

In this stage the team studied the models of career and technical education around the world. As a result, the team developed a comprehensive list of characteristics common to the most successful models.

Determination of the need

The preceding stage, supplemented by interviews with employers, helped identify major trends in the field of careers and work, both nationally and in the local region. This work also helped identify the characteristics and skills employers want in their workforce.
Development of prototypes

In the next stage, the team developed several prototype models, each containing characteristics that could be included in a final CATEC model. These models were designed to generate discussion and analysis in the interviews of the next stage.

Testing of prototypes with stakeholders

After the prototypes were developed, the team took them to employers, community leaders, school leaders, faculty and others. This is an important component of Design Thinking. It involves getting in-depth interviews with stakeholders while observing them sort their preferences. This approach yields more in-depth information than on-line or face-to-face surveys.

Selection of best model(s)

Based on the feedback from the interviews and from lessons learned in the research phase, the team developed a comprehensive model, which was again reviewed with samples of those previously interviewed.

Proposal of phased plan

The final presentation of the new model includes a suggested implementation plan. This report includes all steps in the design process.

The Current CATEC

CATEC is a jointly owned and operated facility of Charlottesville City and Albemarle County providing technical education to high school students and to adults. A Center Board composed of three members each from the Charlottesville City and Albemarle County school boards governs the 57,000 sq. ft. facility on 20 acres in Albemarle County, which opened in 1973.

During the school day CATEC offers career and technical education courses that supplement Albemarle and Charlottesville area high school students’ regular comprehensive high school programs. Evening adult education programs are offered to community members 16 years of age and older.

The Center offers thirteen high-school programs of one- or two-year duration. Two-year programs include Automotive Service Technology, Automotive Body Technology, Barbering, Building Trades, Cosmetology, Culinary Arts, and Masonry. One-year programs include Dental Assisting, Music Industry Technology, and Nurse Aide. Also offered are Firefighting/EMT (one semester each) Green Energy Design & Technology (one- or two-year program), and a one-year Vocational Exploratory Program.

CATEC currently has a faculty/staff of 33 with 314 high school students enrolled in the thirteen offered programs. The facility has an enrollment capacity of 450 students. Fifty percent of the programs meet most industry workplace standards for equipment and facilities; thirty-three percent exceed industry workplace standards (Barbering, Cosmetology, Masonry, and Music Industry Technology). Automotive Body Technology and Green Energy Design & Technology meet most VDOE course standards but are not industry caliber.
State and national certification and licensure vary by program. Students in Barbering, Cosmetology, and Nurse Aide programs may receive state certification/licensure. Automotive Service Technology, Culinary Arts, and Dental Assisting offer nationally recognized certification/licensure. Firefighting/EMT offers state and national certification/licensure. The Automotive Service Technology, Barbering, Cosmetology, Dental Assisting, and Nurse Aide programs receive strong industry recognition with certification/licensure, resulting in competitive employment.

Business involvement is very strong in the Automotive Service Technology and Cosmetology programs; strong in the Barbering, Culinary Arts, Dental Assisting, Nurse Aide, and Firefighting/EMT programs; and gaining strength in the Automotive Body Technology and Building Trades programs. Green Energy Design and Masonry programs have minimal business involvement.

The largest student population is in Cosmetology with 55 students, followed by Culinary Arts with an enrollment of 50 students. Building Trades has an enrollment of 37 followed by the Automotive Service Technology and Nurse Aide programs each with 31, and Automotive Body Technology with 26. Dental Assisting, Music Industry Technology, Firefighting/EMT, and Barbering have enrollments of 18, 16, 15, and 11 respectively. Green Energy Design has an enrollment of 4; Masonry has 7.

Evening offerings for adult continuing education at CATEC cover a range of technical education courses designed to enhance current skills, provide new knowledge and skills for increased job marketability, and continue life-long learning. Course offerings include computer training and health services. A broad spectrum of apprenticeship programs includes electronics, carpentry, masonry, plumbing, cosmetology, and barbering.

**Phase I Research**

Phase I in the project creation and proposal of a new model for the CATEC of the 21st Century included the clarification of Career and Technical Education (CTE) and its evolving role; the identification of leading edge CTE approaches in the United States and abroad; a literature review of national, state, and local studies and statistics; and projections of national, state, and local workforce needs.

**Career and Technical Education – What it is and how it has evolved**

Career and Technical Education (CTE) has replaced Vocational Education in the vocabulary of school administrators in the U.S., whereas Vocational Education and Training (VET) is the term used in Europe. Today’s CTE prepares students for a wide range of careers and further educational opportunities, including industry-recognized credentials, postsecondary certificates, and two- and four-year degrees. The goal of CTE is to promote college- and career-readiness skills such as core academic skills and the ability to apply those skills to concrete situations in order to function in the workplace and in routine daily activities, employability skills (such as critical thinking and responsibility) that are essential in any career area, and job-specific, technical skills related to a specific career pathway.¹
Within CTE, 16 Career Clusters® group occupations and career specialties based on a set of common knowledge and skills that prepare learners for a full range of opportunities, each with 79 related Career Pathways. Comprehensive Programs of Study align academic and technical content in a coordinated, non-duplicative sequence of secondary and postsecondary courses, and lead to an industry-recognized credential or certificate at the postsecondary level or an associate or baccalaureate degree. Middle schools, high schools, area career and technical centers, community and technical colleges, and other postsecondary institutions offer CTE.²

In building the nation’s economic vitality, we often overlook the importance of CTE. Too many educators assume that career and technical training is for the last century, not this one. Many reformers treat CTE as old school, rather than as a potential source of cutting-edge preparation for careers. Vocational education lacked academic rigor and relevance. It was a last-stop destination—rather than serving as a launching pad to postsecondary education and industry-recognized certifications leading to a good job.³

In past decades, high school graduates throughout the United States perceived minimal options for their futures. They felt compelled to choose one of two forks in the road, with one path leading to college, the other to an entry-level job. The choices, however, are much more complex and interconnected in today’s 21st century global economy. Numerous paths, all of which begin with and require a robust high school experience that prepares all students, whether for college or job entry, have replaced the simple “fork in the road” idea.

As depicted by the graphic, effective career pathways rely on coordination across education and training programs in order to offer a clear sequence of industry-relevant coursework and credentials to job seekers. Today’s education and training programs include online and in-person opportunities. After being in the workforce, a person may choose to go back for more credentials to make an upward or lateral career move.⁴

Nationwide, career & technical education programs are changing, evolving and innovating to better serve the country’s 21st century needs. CTE is preparing students of all ages to help drive America’s success and vitality. Further, it is creating an educational environment that integrates core academics with real-world relevance. CTE is leading this change, transforming expectations and making a difference for students, for secondary and postsecondary schools, for businesses and industry—for America.⁵

Current and Future Workforce Trends

Numerous reports and studies focus on current workforce trends and attempt to predict the workforce of the future. While rapid changes in research, design, and technology make it difficult to accurately forecast the workplace of the next decades, commonalities in current research provide invaluable insights.

According to March, 2012 statistics from the Bureau of Labor Statistics Division of Occupational Outlook, by 2020 the economy will create 54.8 million job openings, 20,276,000 of which will be
new jobs and 34,524,000 of which will be openings due to replacement of current workers (mostly due to retirement of current workers).

Other research reveals that current job openings are robust for both the middle skill jobs as well as BA+ jobs—and predict that trend will continue. Middle-skill jobs, which require more than a high school but less than a four-year degree, make up the largest part of America’s labor market. Job opportunities and workforce forecasts indicate concerns surrounding the demand for middle skills jobs and the supply of skilled workers. About 51 percent of all jobs today are middle-skill. About 43 percent of workers have training for these jobs. This results in a skills mismatch and a middle-skills gap.6

Recent surveys from business and industry support these data. One study, Advancing Workforce Policy in the States: Developing Skills for Jobs, a 2013 report by National Skills Coalition Washington DC, included information from two surveys. According to the McKinsey Survey, 64 percent of companies say they cannot find qualified applicants for management, scientific, engineering or technical positions. In another, the National Manufacturing Institute Survey, 67 percent of small and midsize manufacturers report moderate to severe workforce shortages, and they predict this will get worse, not better. Another survey, conducted by The Associated General Contractors of America (AGCA) in August 2013, revealed that 74 percent of construction firms report a struggle to find skilled construction workers at time when construction activity is finally on the upswing.

Information in 2012 from the Division of Occupational Outlook (Bureau of Labor Statistics) provides a graphic of job numeric growth and replacement needs by occupational group, 2010-2020. Notable are those occupations consistent with a foundation in CTE.
Jobs Due to Growth and Replacement Needs, By Occupational Group, 2010-20 (projected)

A 2009 publication, *The 30 Occupations with the Largest Employment Growth 2008-18*, depicted technical jobs with the largest employment growth in the US.

In a recent report, *Regional Existing and Target Industry Analysis*, the Thomas Jefferson Partnership for Economic Development determined targeted industries for Albemarle, Charlottesville, Culpeper, Fluvanna, Greene, Louisa, Madison, Nelson, and Orange. Both this chart and the ones above are consistent with occupations and industries correlated with CTE.
The Global Perspective

Many industries look overseas to find workers with the skills required in growing fields like information technology and advanced manufacturing. Why? If you look at the U.S. secondary education system through a comparative lens, one big difference becomes immediately apparent: most advanced nations place far more emphasis on vocational education than we do.7 According to the Organization for Economic Co-operation and Development’s (OECD) 2008 Education at a Glance, the U.S. does not have the focus on school-based career and technical education programs or on combined school and work-based career and technical education programs found in other countries.

A look at international models provides a better understanding of this focus on career and technical education absent in the U.S. OECD data show that secondary students in competitor nations devote a higher share of their course work to secondary vocational education programs than the United States, with the exception of Canada. Using OECD standards of vocational education enrollment, in most European countries examined, almost half or more of secondary school graduates enroll in a vocational-oriented program (in which they earn 25 percent or more of their total credits). Even in Korea and Japan, with their strong academic traditions, a quarter of secondary graduates major in vocational education by OECD standards. By contrast, since the early 1980s the percentage of U.S. secondary students meeting OECD standards declined from about 18 percent to six percent.8

Throughout northern and central Europe especially, vocational education and training (VET) is a mainstream system, the pathway helping most young people make the transition from adolescence to productive adulthood. In Austria, Denmark, Finland, Germany, the Netherlands, Norway, and Switzerland, after grade 9 or 10 between 40 and 70 percent of young people opt for an educational program that typically combines classroom and workplace learning over the next three years. This culminates in a "qualification" (diploma or certificate). In virtually all of these countries, vocational education also provides a pathway into tertiary education for those who choose to take it.9
VET has two basic models. The first, usually referred to as apprenticeship or the dual system, has students spend three or four days in paid company-organized training at the workplace, with the other day or two in related academic work in the classroom. Germany has the oldest and best-known apprenticeship system, which offers programs leading to recognized qualifications in about 350 different occupations. Switzerland also has a very highly regarded apprenticeship system.

A second group of countries have opted for a model of vocational education provided in school-based programs, although they all incorporate at least some work-based learning. These countries typically introduce students to a broad cluster of occupations (e.g. health care or IT) before narrowing the focus of training in the third year.

**Job Shortage or Skills Shortage?**

Obtaining a good job—one capable of providing a family-sustaining wage—has become the ultimate standard for educational adequacy. The mass postsecondary educational system has arrived, leaving academics the debate over “college for all.” Experts might contest whether everyone needs some college education—but the labor market clearly has linked middle-class employability to postsecondary education and training. Essentially, postsecondary education or training has become the threshold requirement for access to middle-class status and earnings in good times and bad. It is no longer the preferred pathway to middle-class jobs—it is, increasingly, the only pathway.

The debate further continues as to whether the country is facing a job shortage or a worker shortage. As many studies indicate, we have a large potential workforce—an existing and growing population, many of whom are currently unemployed or underemployed. The focus is not on workers overall. It’s not a worker shortage. For many companies, it’s a talent shortage. The skills gap continues.

To succeed, manufacturing and technical workers need better training, and must be more creative and highly skilled than ever before. Like their counterparts in other settings, such as hospitals and labs, manufacturing workers are now “knowledge workers” who must use their brains every minute of every shift to get the job done. They must understand complicated processes and be able to predict, prevent, troubleshoot, and solve problems in a high-pressure environment. This means that, as in other economic sectors, high-level, multidisciplinary technical training is a vital part of worker preparation.

This problem is not limited to the manufacturing sector. Across a wide range of industries that rely on middle-level workers, institutions are not teaching the skills that employers need. The private sector spends roughly $135 billion per year training its workers, struggling to correct for an ill-prepared workforce.

**Workplace Readiness Skills for the Future**

As technology races ahead, low-skill workers will reallocate to tasks that are non-susceptible to computerization—i.e., tasks requiring creative and social intelligence. For workers to win the race, however, they will have to acquire creative and social skills.

The outlook for workers without college degrees may be uncertain, but not devoid of hope. There will be job opportunities in middle-skill jobs, but not in the traditional blue-collar production and white-collar office jobs of the past. Rather, what is expected is a growing employment among the ranks of the “new artisans”—licensed practical nurses and medical assistants; teachers, tutors and
learning guides at all educational levels; kitchen designers, construction supervisors and skilled tradespeople of every variety; expert repair and support technicians; and the many people who offer personal training and assistance, like physical therapists, personal trainers, coaches and guides. These workers will adeptly combine technical skills with interpersonal interaction, flexibility and adaptability to offer services that are uniquely human.17

Despite changes in the workplace over the past twenty years, employers from all sectors and across the nation rate workplace skills, character, and behavior as vital qualities for entry-level employees. In 2008, the Society for Human Resource Management reported responses from human resource professionals when asked how skill requirements had changed over the past two years. Respondents, from companies employing workers from high school graduates through four-year graduates, indicated that workplace readiness skills were becoming more important in the workplace—not less. As the chart below shows, workplace readiness skills such as adaptability/flexibility, critical thinking/problem solving, and professionalism/work ethic were judged as becoming more important than in the previous two years.18

Skills Considered “Much More Important Now” than Two Years Ago for New Entrants

<table>
<thead>
<tr>
<th>Skill</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adaptability/flexibility</td>
<td>38%</td>
</tr>
<tr>
<td>Critical thinking/problem solving</td>
<td>25%</td>
</tr>
<tr>
<td>Professionalism/work ethic</td>
<td>25%</td>
</tr>
<tr>
<td>Information technology application</td>
<td>25%</td>
</tr>
<tr>
<td>Teamwork/collaboration</td>
<td>25%</td>
</tr>
<tr>
<td>Diversity</td>
<td>25%</td>
</tr>
<tr>
<td>Creativity/innovation</td>
<td>25%</td>
</tr>
<tr>
<td>Written communications</td>
<td>25%</td>
</tr>
<tr>
<td>Oral communications</td>
<td>25%</td>
</tr>
<tr>
<td>Health and wellness choices</td>
<td>25%</td>
</tr>
<tr>
<td>Leadership</td>
<td>25%</td>
</tr>
<tr>
<td>Ethics/social responsibility</td>
<td>25%</td>
</tr>
<tr>
<td>Reading comprehension</td>
<td>25%</td>
</tr>
<tr>
<td>Writing in English</td>
<td>25%</td>
</tr>
<tr>
<td>Lifelong learning/self-direction</td>
<td>25%</td>
</tr>
<tr>
<td>English language (spoken)</td>
<td>25%</td>
</tr>
<tr>
<td>Understanding of globalization</td>
<td>25%</td>
</tr>
<tr>
<td>Global economics</td>
<td>25%</td>
</tr>
<tr>
<td>Foreign languages</td>
<td>25%</td>
</tr>
<tr>
<td>Personal financial responsibility</td>
<td>25%</td>
</tr>
<tr>
<td>Civic/community participation</td>
<td>25%</td>
</tr>
<tr>
<td>Mathematics</td>
<td>25%</td>
</tr>
<tr>
<td>Entrepreneurship</td>
<td>25%</td>
</tr>
</tbody>
</table>

In 2009, the Weldon Cooper Center researchers sought input from Virginia employers on a proposed update of the workplace readiness skills in Virginia’s career and technical education curriculum. Employers from a variety of fields submitted comments on a list of 21 skills developed by the Career and Technical Education Consortium of States, Virginia’s CTE Resource Center, and
Employers were asked to prioritize skills determined to be “essential” for employees.

**Percent of Virginia Employers Rating Skills “Essential”**

<table>
<thead>
<tr>
<th>Skill</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Work Ethic</td>
<td>96%</td>
</tr>
<tr>
<td>Speaking &amp; Listening</td>
<td>96%</td>
</tr>
<tr>
<td>Professional Ethics</td>
<td>95%</td>
</tr>
<tr>
<td>Participates As A Team Member</td>
<td>89%</td>
</tr>
<tr>
<td>Reading &amp; Writing</td>
<td>89%</td>
</tr>
<tr>
<td>Diversity Awareness</td>
<td>82%</td>
</tr>
<tr>
<td>Reasoning, Problem-Solving, &amp; Decision-Making</td>
<td>76%</td>
</tr>
<tr>
<td>Technology Applications</td>
<td>68%</td>
</tr>
<tr>
<td>Understanding Health, Wellness, &amp; Safety</td>
<td>67%</td>
</tr>
<tr>
<td>Understands The Big Picture</td>
<td>64%</td>
</tr>
<tr>
<td>Lifelong Learning</td>
<td>63%</td>
</tr>
<tr>
<td>Job Acquisition &amp; Advancement</td>
<td>60%</td>
</tr>
<tr>
<td>Telecommunications</td>
<td>58%</td>
</tr>
<tr>
<td>Internet Use &amp; Safety</td>
<td>58%</td>
</tr>
<tr>
<td>Creativity, Innovation, &amp; Adaptability</td>
<td>57%</td>
</tr>
<tr>
<td>Leadership &amp; Resource Management</td>
<td>54%</td>
</tr>
<tr>
<td>Research &amp; Synthesis</td>
<td>53%</td>
</tr>
<tr>
<td>Applying &amp; Understanding Mathematics</td>
<td>51%</td>
</tr>
<tr>
<td>Data &amp; File-Management</td>
<td>50%</td>
</tr>
<tr>
<td>Computer Hardware Basics</td>
<td>34%</td>
</tr>
<tr>
<td>Employment-Related Financial Literacy</td>
<td>34%</td>
</tr>
</tbody>
</table>

The Weldon Cooper Center reports on another study, in which over 400 employers across the nation ranked the importance of eleven “applied” skills (those called workplace readiness skills in Virginia), and nine basic or “academic” knowledge/skills. Respondents rated the importance of these skills for employees entering the workforce at three education levels: high school graduates, two-year college or technical school graduates, and four-year college graduates. For these employers, applied skills topped the list of skills rated “very important” for employees at all three educational levels.
“Very Important” Skills for 4-Year College Graduates

- Oral Communications
- Teamwork/Collaboration
- Professionalism/Work Ethic
- Written Communications
- Critical Thinking/Problem Solving
- Writing in English
- English Language
- Reading Comprehension
- Ethics/Social Responsibility
- Leadership
- Creativity/Innovation
- IT Application
- Lifelong Learning/Self Direction
- Diversity
- Mathematics
- Science
- Foreign Languages
- Government/Economics
- History/Geography
- Humanities/Arts

* Applied Skills

Percent Rating Skill “Very Important”

“Very Important” Skills for 2-Year College Graduates

- Professionalism/Work Ethic
- Teamwork/Collaboration
- Oral Communications
- Ethics/Social Responsibility
- Reading Comprehension
- English Language
- Critical Thinking/Problem Solving
- IT Application
- Written Communications
- Diversity
- Writing in English
- Lifelong Learning/Self Direction
- Creativity/Innovation
- Mathematics
- Leadership
- Foreign Languages
- Science
- Government/Economics
- History/Geography
- Humanities/Arts

* Applied Skills

Percent Rating Skill “Very Important”
“Very Important” Skills for High School Graduates

While many middle-skill jobs are susceptible to automation, others demand a mixture of tasks that take advantage of human flexibility. These middle-skill jobs will persist, and potentially grow, because they involve tasks that cannot readily be unbundled without a substantial drop in quality. Consider, for example, the frustration of calling a software firm for technical support, only to discover that the technician knows nothing more than the standard answers shown on his or her computer screen—that is, the technician is a mouthpiece reading from a script, not a problem-solver. This is not generally a productive form of work organization because it fails to harness the complementarities between technical and interpersonal skills. Simply put, the quality of a service within any occupation will improve when a worker combines routine (technical) and non-routine (flexible) tasks.\(^{21}\)

In *Dancing with Robots: Human Skills for Computerized Work*, Levy and Murnane contend that human work in the U.S. economy increasingly consists of three types of tasks: non-routine manual tasks, solving unstructured problems (car repair), and working with new information (determining a customer’s Internet problem). The growing importance of the second and third tasks represents a significant shift. For much of the 20th century a significant amount of work involved following directions. In many situations, directions were a shortcut—a way to accomplish a task without much knowledge of the underlying process. Today, computers and workers in lower-wage countries are increasingly carrying out work that consists of following clearly specified directions. The remaining jobs that pay enough to support families require a deeper level of knowledge and the skills to apply it.\(^{22}\) To further demonstrate the changing skills of the workplace, Levy and Murnane developed an Index of Changing Work Tasks in the U.S. Economy, depicted below.
CTE – Significance, Barriers, Needs, and Promising Practices

Dr. Joseph Scarcella, Professor of Education and M.A. Program Coordinator for the Career and Technical Education Teacher Education Program, California State University, San Bernardino, predicts that with greater technological advances, the influence of CTE throughout education will become more profound and will require even more connection between academics and CTE: “As technology evolves, our society is going to become so complex that we will have to have some form of CTE imbedded in all of our education.” And, according to Dr. Stephen S. Fuller, Center for Regional Analysis at George Mason University, “Demand for workers to fill new and replacement jobs will substantially exceed the supply of available workers in every major occupational category.”

In light of these comments and the research indicative of the need for middle-level skills for current and future employment, the evidence of job-skills gaps, and the diverse skills required for the 21st century workforce, it is imperative that career and technical education be considered a major component in the economic landscape. The question is, then, how do we make CTE programs viable resources for employers and who is responsible?

In the 2006 Are They Really Ready to Work? Employers’ Perspectives on the Basic Knowledge and Applied Skills of New Entrants to the 21st Century U.S. Workforce, a report conducted jointly by The Conference Board, Partnership for 21st Century Skills, Corporate Voices for Working Families, and the Society for Human Resource Management, over 400 employers across the nation employers were asked who should be responsible for providing the necessary basic knowledge and applied skills for their new entrants? Over seventy-five percent of employers indicated that K-12 schools should be responsible for making new entrants work-ready.
Yet, according to research, there are obstacles to overcome in order to elevate the position of CTE programs as viable sources of Virginia’s, and indeed the nation’s, future workforce. Numerous studies have determined barriers to the success of CTE.

**Barrier: Attitudes/Perceptions/Engagement**

For many, there is still a stigma attached to CTE and a perceived notion that career and technical education remains the “vocational training” of a generation ago.

Not all parents are receptive, fearing that CTE involves removal of students from the regular school setting and poses a threat to academic learning, drawing children away from college preparation and attendance.27

Employer engagement and partnership is lacking. Some employers have little confidence that involvement in partnerships or school-to-work initiatives will be cost effective or reap rewards in reduced hiring costs and greater productivity. School-to-work concerns include costs of bringing students into the organization/allocating time for skilled workers to work with them, laws regarding child labor and safety, insurance costs for general liability and workers’ compensation, and management and employee resistance to work-based learning.28

Postsecondary institutions, both two- and four-year colleges, may be reluctant to participate in collaboration with high schools/CTE programs with concerns surrounding increased costs and hassles involved in collaboration efforts and the threat to institutional control and accountability.29 The end result is a loose coupling and duplication among providers.

Teachers may be fearful of change and reluctant to devote the time and effort required to learn and incorporate new ways of teaching and learning into their instruction, curriculum, and classroom management.30 Professional development to support and guide faculty is often deficient.

High school guidance counselors often guide students toward college preparation rather than career-pathway exploration. Career guidance at many CTE centers is nonexistent.

Minimal media attention to CTE results in limited public awareness of the opportunities available. CTE centers do not self-promote to highlight merits, accolades, and accomplishments.

While some employers turn to CTE as an important source of talent to fill skilled positions within their companies, education and workforce policies have not been sufficient to date to close major skills gaps in the U.S. labor market (relative to demand).31
Barrier: Lack of Effective, High-Quality CTE Programs

CTE programs often lack alignment with college- and career-readiness standards AND with the needs of employers/industry/labor. Programs do not provide students with a curriculum based on integrated academic, technical content, and strong employability skills AND work-based learning opportunities that enable students to connect what they are learning to real-life career scenarios and choices. Often students do not graduate with industry certifications or licenses and postsecondary certificates or degrees that employers use to make hiring and promotion decisions.  

Many CTE centers are obsolete in terms of adequate the facility, space, equipment, and functional labs. Funding streams are inadequate to sufficiently maintain a center geared to the 21st century workplace. Too often, regulations or organization constraints impact the ability of a center to move forward.

What’s Needed

A 2012 report, *Investing in America’s Future: A Blueprint for Transforming Career and Technical Education*, issued by the U.S. Department of Education’s Office of Vocational and Adult Education, proposed a transformation of CTE and the ushering in of a new era of rigorous, relevant, and results-driven CTE shaped by four core principles: 1) Alignment between high-quality CTE programs and labor market needs; 2) collaboration among secondary and postsecondary institutions, employers, and industry partners; 3) accountability for improving academic outcomes and building technical/employability skills; and 4) innovation to support CTE implementation of effective practices.

The National Skills Coalition recommends two additional characteristics for robust CTE programs: Sector/Industry Partnerships and Career Pathways/Integrated Education and Training. Sector/industry partnerships involves engaging employers in a meaningful way by convening multiple employers from a regional industry sector to assess and validate labor market information, identify expected job openings and skills and credentials required for these jobs and to engage education/training providers and other stakeholders to develop solutions and training programs targeted to the skill needs. Career pathways/integrated education and training implies a sequence of education and training courses and credentials that are built around the skill needs of employers and industry sectors, contextualized learning, multiple entry and exit points, stackable credentials or credits leading to industry recognized credentials, intensive wraparound support services and job placement.

Promising Practices

A review of CTE programs across the U.S. revealed commonalities in successful practices. In these cases, the program:

- Is relevant to community/industry needs
- Is aligned with high employment demands & regional economic development plans
- Contains classroom instruction concurrent with work-based learning and soft skills training
- Gives exposure to multiple aspects of industry or job category
- Includes mentoring, apprenticeships, on-the-job work experience
- Provides performance evaluation of demonstrated competencies
- Provides credentialing: certificates, end-of-program assessments
• Provides involvement with competitions, conferences, career development events
• Includes career and lifelong learning counseling
• Includes academies, career clusters, specific career pathways
• Includes partnerships among high schools, community colleges, employers
• Includes dual enrollment linkages among high schools, community colleges
• Includes two-, three-, and four-year programs
• Provides up-to-date lab and project-based learning opportunities
• Is part of a collaborative network of providers
• Has multiple funding streams
• Has engaged employer involvement
• Has highly competent faculty and staff with relevant practical experience
• Has a strong faculty recruiting and development capability
• Has strong competencies in project-based course design
• Has multiple course delivery channels

Some notable programs across the country:

Massachusetts and Wisconsin are two recipients of federal School-to-Work Opportunities Act (STWOA) implementation grants dedicated to combining school-based learning, work-based learning, and connecting activities.

Maryland and Pennsylvania have strong programs in tech prep and apprenticeship. In PA, 76 industry partnerships, concentrated in 11 targeted industry clusters, cover every county & encompass local workforce and economic development agencies, education and training providers, non-profit and faith-based organizations, and, most importantly, small and large employers with similar workforce challenges.

Pennsylvania’s SOAR (Students Occupationally and Academically Ready) aligns PA Academic Standards and Validated Core Common Competency Lists.

Washington, D.C. allocated $2.8 million to help city high schools plan for nine new “career academies” meant to help students gain the skills they will need to enter the workforce after graduation. The academies will offer internships and training in one of three career tracks: hospitality, engineering and information technology—three areas in which the District needs workers.

Oklahoma’s Craftsmanship 2000 (C-2000) is a model school-to-work transition program.

Wisconsin’s Youth Apprenticeship program is part of a statewide School-to-Work initiative. Designed for high school students, the program integrates school- and work-based learning to instruct students in employability and occupational skills defined by Wisconsin industries.

Importing the Northern European apprenticeship model to the United States, three community college programs combine classroom learning with paid worksite training and guarantee successful graduates a job:

• Volkswagen Academy – a partnership between VW and Chattanooga TN State Community College in a three-year apprenticeship program.
• Apprenticeship Charlotte (NC) – apprentices earn a three-year associate degree or a more streamlined certification in a particular technical field and earn a wage for their on-the-job training.
• Future for ME – a Maine partnership of employers, community colleges, and philanthropists with the goal of training workers for 1,000 unfilled, mid-skill manufacturing jobs. Recruits earn a two-year associate degree and then work as machinists for small companies. A separate, one-year program trains workers in robotic textile manufacturing.

Conclusions

Methods of work are under pressure and changing rapidly. The continuous state of transformation in technologies, products, and markets requires agility in workforce development and redeployment. While some sources predict that many jobs of the future will require high-skilled, college-degreed workers, research also points to the current and growing need for workers with mid-level skills. Middle-level job requirements outstrip the supply; our supply system is simply not equipped to meet the demands. A skills gap—the mismatch between job requirements and the current skills of many workers—exists and is expected to continue.

Many studies attempt to predict the jobs of the future. Such predictions are difficult, with many past predictions proven wrong. While workforce-forecast research is inconsistent, job skills requirements are consistent across all sources. Future work skills—proficiencies and abilities required across different jobs and work settings—compel an integration of hard and soft skills.

The future of the country’s workplace necessitates that all workers have the opportunity to equip themselves with the tools necessary to succeed in their careers and in whatever field they choose in the 21st century global economy. Research drives the message: The landscape has changed, appropriate and applicable education and training is imperative, and educational institutions must adapt quickly in response. Career and technical education must be redefined so it is regarded as a valued and respected pathway, as a partner with other educational/training organizations and with industry sectors, and as a means of developing an agile and well-aligned, adequately equipped workforce.

There are obstacles, but also opportunities.

Phase II and Phase III, Preliminary Model Development

Phase II of the project design process used the results of Phase I to determine characteristics of the ideal CATEC solution, identification of strategic questions and possible constraints, identification of open issues and challenges, and development of preliminary models for stakeholder input. Preliminary models were modified and redesigned as prompted by input from numerous and varied sources. Efforts during this phase also included methods to advance community support for the design of a “new CATEC.”
Preliminary Model Development

The creation and proposal of a new model for CATEC began with the development of several alternate models. Models development required examination and consideration of numerous elements of the current CATEC including facilities, program, administration, teachers, technology, career tracks, funding, relationships with stakeholders and other providers, simulation of job/work environment, instructional design, and core competencies.

The preliminary models presented a variety of features and modifications to enhance the training and career prospects of students and adults in the region. Beginning with a model of the existing CATEC, additional models, not intended to be “complete” alternatives or mutually exclusive, depicted diverse characteristics for potential incorporation into a new CATEC. A “Do-It-Yourself” (DIY) model allowed stakeholders and user groups to make recommendations to the CATEC design. Integration of these DIY model responses with feedback on the other preliminary models provided a composite picture.

Depictions of the models are on the following pages. Following each model are key characteristics specific to that model. Models included are:

- Current CATEC model
- CATEC Full-time model
- Centers of Excellence model
- Certification Center model
- Career Path Integration model
Current CATEC model

Characteristics of this model

- Jointly administered by Albemarle County and Charlottesville City Schools
- Part-time supplement to high school
- Students primarily non-college bound
- Adult training in selected fields
- Certification/licensing in some fields
- Mixed employer engagement
- Instructors from career tracks
- Obsolete building
- Equipment challenges
- Public funding through school systems
- Career guidance in high schools focused on college
CATEC Full-time model

Characteristics of this model

- Full-time CATEC program for last two years of high school
- Integrated career development curriculum
- Distance education as needed from other high schools
- School-to-work experiences
- Stronger employer engagement
Centers of Excellence model

- Strong employer engagement; focal point for employer needs and long-range trends
- Center of expertise for career guidance
- Interprets needs into career tracks; expertise in translating employer needs to training curricula
- Center of excellence for career-based training design
- Supplement to high school curriculum
- Career-based courses and labs; project-based learning courses
- Database of project-based learning courses
- Adjunct teachers as appropriate
- Rotational assignments for “expert” instructors
- Strong faculty development program
- Advanced, but flexible, labs and testing facilities
- Distance education center for career-based courses
- Developer and keeper of career-based training measurements
Certification Center model

Characteristics of this model

- Provides curriculum tracks for only certified/registered vocations
- Develops appropriate online courses and tests
- Develops certifications where needed, with employer involvement; manages certifications across the school systems
- Certifies students as work ready with a skills demonstration certification developed with input from employers; designs tests to certify students and adults
- Has strong employer engagement
- Has advanced labs and testing facilities
- Is center of faculty development for CTE instructors; certifies instructors
- Uses adjunct teachers as appropriate
- Has close relationship with Piedmont Virginia Community College (PVCC)
- Has exceptional engagement of employers in each career track
- All those who desire certification go to CATEC
Career Path Integration model

Characteristics of this model

- Strong link to innovation clusters
- Strong connection to employer needs in each career track
- Certifications in each track
- Linkage with economic development clusters
- Strong integration of CATEC and PVCC; curricula linkage; integrated/dual use of lab facilities
- Integration of learning and work experience
- Focus on broad needs, not just local
- Integrated curricula focus in each track
- Provides focus & clarity to career counseling
- Strong employer engagement: part of robust advisory network; help develop training curriculum; provide mentors/apprenticeships/internships; provide performance feedback, equipment, and access to equipment; and provide adjunct teachers
Do-It-Yourself model

This model was used to obtain the preferences of people interviewed after they had reviewed the other alternate models. They were asked to circle the characteristics they preferred and cross out those they did not prefer. This model also gave them the option of adding other characteristics.

Characteristics of this model

- Opportunity for stakeholders to design their own model
- Provides perceived needed components and features for inclusion in final model
- Means of soliciting input from community
- Means of sparking interaction and discussion
Gathering Input and Garnering Support

Communication with representatives of constituent groups to determine their needs, their perception of the current CATEC program, and their commitment and support of a redesigned career and technical education center was key in the Phase II process. Efforts were made to include diversity in groups and individuals in order to yield the best and broadest ideas and concepts, as well as to generate engagement and enthusiasm across the community, and to judge stakeholders’ commitment to involvement. Extensive comments, suggestions, and recommendations were collected from various stakeholders, community members and organizations, and business and industry representatives.

The Project Team conducted copious individual interviews. While most were scheduled, formal interviews, many were informal, impromptu conversations with people from various careers and training backgrounds. Others included local politicians and business owners. Still others included individuals in various segments of the construction industry and in the trades education process. Project Team members with national and international colleagues sought information regarding current trends in career and technical education, workforce movements, and job predictions in the U.S. and abroad.

A compilation of Phase I research results was shared with Albemarle County and Charlottesville City School Boards in October, 2013. The preliminary models were provided to both Boards and presented to the CATEC Center Board (comprised of representatives from the two Boards) in December. The CATEC Center Board provided feedback in the form of questions, comments, and recommendations and participated in the DIY model exercise. At the January, 2014, CATEC Center Board meeting the Project Team presented a comprehensive model developed from components of the various preliminary models and constituent feedback. Based on Board evaluation and recommendations, the team presented a final proposal to the Board in February.

In addition to the CATEC Center Board and the CATEC director, groups and individuals associated with the technical education center offered contributions. The CATEC Foundation developed optimal designs for the facility. Interviews with CATEC students afforded suggestions regarding the current and potential future of the school. The first of two CATEC faculty dialogues provided overall insights and general observations; the second an opportunity for the staff to weigh in on the preliminary models.

Others in the field of education who contributed to the design process included school superintendents from Albemarle County and Charlottesville City, Career and Technical Education directors from Charlottesville and Albemarle Schools, Charlottesville High School staff, city and county high school principals, and Western Albemarle High School students. Leadership at Piedmont Virginia Community College provided broad participation and response in support of the preliminary models design process.

Project Team members met with numerous organizations for preliminary models feedback and discussion. Business groups included, for example, Robertson Electric, Barton Malow, McGuire Woods, Crutchfield, Branch Group, Merrill Lynch, Indoor Biotechnologies, Microaire, University of Virginia, Martha Jefferson Hospital, ACAC, CFA, SNL, Trump Winery, and Commonwealth Assisted Living.

Organizations such as the Charlottesville Chamber Economic and Government Affairs Committee and Leadership Charlottesville Alumni provided feedback, as did industry-specific groups including the Associated General Contractors of America (AGC), the Virginia Association of Career and Technical Education (VACTEA), and the PVCC Construction Academy Board.
Project Team members garnered additional information via attendance at conferences and presentations. These included a VACTEA Conference: Connecting Construction Educators & Employers, the Virginia Small Business Partnership: Virginia Workforce Development Challenges and Solutions, STEM conference in D.C., Governor's STEM Summit: High School of the Future Startup, and the AGC of America National Chapter Leadership Conference.

Efforts to advance awareness of the strategic planning and designing for CATEC project and to build community support were also elements of the Phase II process. Presentations, open meetings, broadcast interviews, print media, and social media were avenues for these objectives.

The Project Team made multiple presentations including those to the CATEC Center Board and the joint Charlottesville City and Albemarle County school boards, and at an open meeting at City Space in January, 2014 and a second open meeting at the Albemarle County Office Building in February, 2014.

Broadcast and print media coverage included interviews on 1070 WINA, interviews and coverage by Charlottesville Tomorrow, the Daily Progress, and Channel 29. Documents regarding Project research and models development were also available at the Channel 29 website.

YouTube presentations delivered an overview of Project Team’s work and preliminary models.

The Institutes Model

An extensive process of compilation and coordination of all responses amassed during the two-month collection period followed. The result was a comprehensive preliminary model reflecting research, best practices, and input as previously delineated.

This preliminary model for CATEC incorporates the findings, recommendations, and implications from each stage of the strategic planning and designing process. The model is representative of an organization tuned to excellence, agile in nature, aligned with partners (employers and other education organizations), geared for flexibility, focuses on needs and users, and anticipates the need rather than lagging the need. Further, the model promotes robust curricular and staff development, effective instructional design, strong human values, learning competence, and lifelong learning.

The Institutes Model combines elements of the previously described Career Path Integration and Centers of Excellence models. As a composite model, it incorporates the career paths from middle school to CATEC to the universities, as well as a focus on economic innovation clusters with employer council advisement on the curricular needed in each track. It further incorporates the finding of a strong need for experts to design the kind of hands-on courses needed for workplace development or skills development—a skills set primarily found in businesses more so than in the academic communities within the school system where the focus is mainly on academic topics.

The model breaks CATEC into groupings that facilitate employer involvement, program development, laboratory optimization, and skill outcomes. The model includes five institutes: Skilled Trades, Customer Service, Healthcare Services, Manufacturing and Information Technology, and Early Childhood Education, each with an active employer/academic/instructional design council to guide program development, lab development, work experiences, and long-range planning. Institutes serve both high school students and adults who need course work, and may be funded by public/private partnerships. Based on a long-range view, with model elements developed according to demand, the institutes produce “trainable” graduates who opt to go to community college, apprenticeships, university, or company training. All five institutes incorporate computer skills.
The model builds on a closer relationship and strong collaboration between CATEC and Piedmont Virginia Community College. It proposes a smooth transition between grades 11 and 12 provided by CATEC, and grades 13 and 14 provided by PVCC. This is not an implication that the two organizations will merge, but rather a robust alliance by which students move effortlessly from CATEC into PVCC in any chosen career track. The model features collaborative curricula and labs development with courses, as designed, assigned to CATEC or PVCC. The model also promotes employers working in conjunction with PVCC and CATEC to design curricular specific to workforce needs and to create a system of certification, apprenticeship, and internships.

Employer engagement is critically important to the formation and implementation of the institutes. A board comprised of employers, along with CATEC, and PVCC representatives will design each institute, oversee curriculum and program development and continually mentor and advise institute management.

The following graphics depict major components and features of the Institutes Model, with illustrations of the possible topics and career paths within each institute. Additional comments follow each graphic.

**The Institutes Model: Components and features**

The model includes a Self-Development Foundations component that targets basic workforce skills, often referred to as soft skills, embedded across, and within, the five institutes to provide students with the fundamental human skills needed for job. The model also features a Skills Assessment Center to assess the skills of incoming students and, as they exit the school, provide career guidance to align students with their interests, and develop program certifications. The Program Design Center focuses on curricular design, job research, and distance education. The Program Design Center also stays cognizant of technological and workplace trends, thus giving CATEC the ability to continually update offerings to meet the needs of current and future students. In addition, it is the center for institutional research, collecting and analyzing data regarding student achievement, career choices and success in the world of employment.

The following charts show the various institutes, Skilled Trades, Customer Service, Healthcare Services, Manufacturing and Information Technology, and Early Childhood Education in sequence.
While each institute planning team will decide curriculum, potential illustrative topics and career paths are shown for each. The charts illustrate the institutes with potential topics or career paths in each.

Illustrative topics

All employer interviews and surveys cited the need for the “soft skills” and work ethic required by modern workplaces. In an environment where teamwork, flexibility, and customer service are fundamental to the success of every organization, leaders want employees who have the social, human, analytic, and critical thinking skills to deal with the complexities of rapidly changing business and economic environments. In addition, to keep pace with the demands of these changes, successful employees and professionals must continue to learn throughout their career. The motivation and ability to continue learning is fundamental to economic success in the 21st century. Students need to learn in school, but they must also learn how to continue to learn.

To address the foregoing needs, students in all institutes will participate in The Self Development Foundations program. This program will help students learn work cultures while developing and practicing the skills necessary for a rewarding and satisfying work career.

Superior customer service is an important foundation of all modern organizations. To be successful, organizations must develop loyal customers and constituents; those who return over and over to take advantage of the organization’s products and services. Customers who have memorable experiences at every point of contact with the organization become loyal over time. Whether president, sales person, or customer service representative, each employee strives to provide exceptional customer experiences.

Customers interact with organizations in multiple ways, face-to-face, telephone, mail, texting, Internet, receiving or sending packages and materials, or interacting with multimedia. All organizations need employees with customer service skills. Indeed, the Charlottesville/Albemarle
region demonstrates the wide variety of customer service skills needed. At the high end, SNL’s customer service representatives work via phone and Internet to help customers with sophisticated, complex financial analysis requests. Crutchfield’s representatives help customers with hi-technology questions, while hotels, banks and others work both online and face-to-face with customers.

One could say that the level of customer service in a region can shape the region’s reputation with other businesses, tourists, and the general public. What if the Charlottesville region became the “customer service capital of the USA,” a place known for great hospitality and warm experiences?

The Customer Service Institute will develop people with the skills and background to thrive in the customer service environment.

The Skilled Trades Institute incorporates many of the topics currently covered in CATEC’s curricula, but provides a broader perspective that can fill the needs of large construction firms and a broad range of other sectors that need employees with hands-on physical and mental skills. As with other institutes in the mix, the studies and skills development within this institute will provide a smooth path through PVCC so students can attain certifications and credentials recognized by prospective employers.

Planning for the Early Childhood Education Institute is already in progress at CATEC and aims to train students to be assistants, teachers or care providers of children in their preschool years. When fully implemented, an on-site laboratory will give students experience in a real-life child care center.

The need for specialists and technicians in 21st century information technology, networking, and associated technologies is well established. This Manufacturing and Information Technology Institute aims to help students develop the skills to produce and support companies that provide
technological solutions, as well as those who depend on the technologies for the everyday running of their business. Keeping up to date on the latest trends and technological development is especially important to this institute. The program must give students the fundamental skills needed to advance in the field, and also give them the ability to move into important new technological areas.

Many manufacturing companies moved out of the Charlottesville region over the last twenty years, yet, here, as well as all over the nation, there are hopeful signs that the manufacturing industry is reviving. The “new manufacturing” will probably look much different from the plant of old. Robots and automated processes with sophisticated software controls will likely be the norm. Products customized to a particular client’s needs will probably replace high-volume sameness. New materials and new processes, including nanotechnology and additive printing will bring new possibilities for products and services. Overnight or one-hour deliveries will accentuate the need for fast turnaround manufacturing and distribution methods. Sophisticated control systems will assure the manufacturing facility operates in an efficient, sustainable way. The Manufacturing and Information Technology Institute will provide forward-thinking, relevant paths to employment in the new manufacturing environment.

Healthcare is the primary industry in the Charlottesville/Albemarle region offering job opportunities from administrators to technicians to surgeons. The Healthcare Institute will focus primarily on the skilled support workers who employ medical technology, provide important services, and administer the healthcare system.

The following chart shows another view of the model, depicting Institutes and Centers.
Steps to Implement the Institutes Model

The following represent the broad, initial steps to implement the Institutes model:

Redefine role of CATEC director to focus strategic objectives.

Managing the transition to the new model will be a full-time job. The current CATEC Director, Dr. Adam Hastings has the strategic vision, leadership abilities and operational experience needed to fulfill that role. That means he will need additional support to manage the day-to-day operations of the center.

Appoint a Public/Private steering group to oversee the change process (representatives from CATEC, PVCC, business, experts).

This group needs to be well informed about the new model and the institutes involved. Each member should be strongly engaged and passionate about the mission and future of CATEC, PVCC, and the need for good workforce development in our region.

Decide the sequence of institute formation.

The following chart suggests a sequence of implementation for each institute. Several participants in the discussions of the model suggested starting with a career path that could be implemented quickly and from which the team could refine the process of institutes design. In other words, go for an "early win." Some suggested Culinary Arts as a place to start because there are good programs at both CATEC and PVCC which, when linked, could provide a good visible example of the collaborative relationship between CATEC and PVCC.

Establish/approve calendar of events.

A later paragraph addresses the proposed calendar of events.

Establish Program Design Center.

Dr. Frank Friedman suggested the design team employ the DACUM (Design a Curriculum) approach developed by Ohio State University. This approach would give the institute design teams a firm process foundation for design. This means finding experts already trained in the process or sending someone to Ohio State for training. These experts could then become the core of the Program Design Center.

Approve the outline and process for institute proposal presentations.

The following sections demonstrate a tentative step-by-step process to use when developing each institute. Each institute planning team will design its own process, but the one presented here can serve as an example.

Approve budget for the detailed planning process.

This report does not include a budget for the planning process. However, once the Board approves the model, the CATEC director will develop and present the budget.
Organizing to Implement the Model

With this proposed structure, the CATEC Center Board, governing body for CATEC, composed of three members each from the Charlottesville City and Albemarle County school boards approves and oversees the implementation of the Institutes Model. This occurs in conjunction with PVCC. A Steering Group oversees the overall planning and process, managing and supervising Planning Teams for each Institute. These Planning Teams, one for each institute, develop curriculum and program. Planning Teams are supported by specialists comprising the Curriculum Design Team.

This structure should also continue after the institutes are formed. Members may change, but employer involvement in the development of the CATEC/PVCC collaboration, and in the implementation of the institutes, will be critical to their success.

Institute Planning

The following chart demonstrates the proposed schedule to plan each of the institutes. This recommends starting with the Customer Service Institute because it represents the broadest need in the region and is also a new focus for CTE. As mentioned earlier, however, participants in discussions of this model suggested starting with a “quick win,” an initiative that would cement and demonstrate the collaboration between CATEC and PVCC, perhaps Culinary Arts. Such a start would build on the good work already done by faculties at both CATEC and PVCC.

The following chart assumed CATEC’s Board approval of this plan at its February 2014 meeting. Because of a weather delay and other board considerations, final approval will likely come in March 2014, thus delaying the schedule by one to three months.
Samples of step-by-step Institute design

The following depicts an example of a schedule for institute planning using the Customer Service Institute. It is seen as a two-to-three month task, and as previously described, is performed by a team comprised of CATEC, PVCC, members of the employer communities associated with the particular institute and others as determined by the expertise needed.
Institute Rollout

This plan initially proposed an ambitious rollout to occur over the next three to four school years with Service, Early Childhood Education, and Skilled Trades institutes and the Self-Development Foundation being the first steps. Further discussions with the CATEC Board and others have suggested a roll-out over four to five years.

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<td>Program Design Center</td>
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Other Questions

Finalization of the Institutes Model requires several to-be-determined factors. Some of these, as noted, must be determined with the planning of each institute. Open questions include:

Should CATEC remain a part-time program or become a full-time program for participating high school students? Can implementation of the model occur with the current part-time schedule whereby students split the school day between CATEC and high schools? Or, does it necessitate a full-time platform in which students attend CATEC for the entire school day, taking all required academic coursework as well as courses dictated by institute design? How would shifting to a full-time program impact the feeder high schools and CATEC? And, how might distance-learning delivery of some courses occur? The most successful models around the world are full-time programs. As planning teams form each institute, they will consider the best mode to deliver the curriculum. This suggests that the institutes be planned first, after which the full-time/part-time question will be addressed. In the meantime, the Steering Group could begin considering the implications of alternate scenarios for program scheduling.

Should the program be centralized or distributed? There are several “academies” in the various high schools in Albemarle and Charlottesville, each designed to support career and technical education (CTE) career paths. The schools could provide a richer, more comprehensive program of CTE if there was stronger coordination and collaboration among these entities. As technology to support education and training becomes more robust, the content of the various programs could become available to a broader population of students.

Given a networked approach to CTE, other regional municipalities may want to take advantage of the CATEC/PVCC program’s strength and depth. This also suggests adding a CATEC component to existing and future PVCC remote locations, such as Stanardsville and downtown Charlottesville.
Is renaming and rebranding needed? A brand is not just a logo; it is a promise and a vision of what organization and its services means to its constituents. The model proposed raises the standard of offerings and excellence for the organization, positioning it as a vital element of workforce and economic development and a place where students develop the critical skills leading them to productive and satisfying careers. “Come to CATEC, and you will be on your way to a good job.” This differentiated identity in the minds of consumers and public will ultimately involve a new name, logo, promotion theme, or combination of these. Such changes will reposition CATEC as a comprehensive, multiple-path organization, thus distancing it from current connotations of a “one-stop vocational education” training center.

In the Institutes planning stages, planners must examine the building and equipment. Will the current facility, built in 1973, support the new program designs? Will the infrastructure support 21st century technology demands? Do obsolete learning tools and machinery need updating? Will new, state-of-the-art tools and machinery acquired? Facility needs will be an important result of the detailed institute planning process. Some proponents have proposed locating CATEC near PVCC, thus selling and vacating the current location. If implemented hand-in-hand with a networked approach to CTE in the region, this could be the ultimate program repositioning strategy.

**Risks**

There are risks associated with a program redesign of this magnitude and reach.

This is ultimately a community project. During the six months of this project, the project team engaged many business people, community leaders and educators. To be successful, CATEC and its supporters should continue to build community engagement. The Executive Director of CATEC should focus on implementing the strategy and continually building community support. The job becomes more of an “outside” rather than an “inside” job, with equal focus on students and employers. The community will need education to alter current perceptions of technical/career training and the persisting “college OR career training” and “college vs. career training” attitudes.

Will employers deliver on their parts? The very foundation and subsequent success of the Institutes Model necessitates the support, inclusion, and active participation of area employers, and requires a linkage with employers and their training needs. Employers must be partners with the organization, collaborators in individual institute design and planning, supporters in instructional delivery, and providers of school-to-work experiences such as internships, mentorships, and apprenticeships. Will employers view students emerging from the Institutes Model as promising and talented, well-trained, and work-ready recruits? Are employers willing to aid through funding or provision of equipment and materials? Do employers acknowledge that regardless of pre-employment education and training, some on-the-job training is unavoidable due to certain job-specific tasks required in diverse workplaces? The proposed structure of Steering Group and Institute Planning Teams is designed to engage the employers in every stage of implementation. An active employer-relations strategy will help build trust and engagement. Enlightened employers invest in building and sustaining their talent pool. Many employers reduced their training budgets and training departments during the recession, cutting back also on internships, apprenticeships and other work experience programs. CATEC, PVCC and other agencies must work with employers to develop new innovative ways to help students gain work experiences.

Can the structures be agile enough to adapt to changing environments? The world of work and the dynamics of the workplace are changing—and at a rapid pace. Consider the changes in
communications, technology, and automation that have occurred over the past twelve years and how these have impacted jobs and workers. Then consider the potential for change in the next twelve years, when current kindergartners will be exiting high schools. Can the Model be flexible enough to adjust and adapt in tandem with unpredictable and shifting environments in order to educate and train individuals for new skills acquisition as they move through life and work? The Model includes a Program Design Center, with responsibility to continually scan workforce trends and employer needs, then translate them into programmatic initiatives. This is a challenging task, but the organization needs to continually upgrade and adapt its offerings.

Can we find ways to help students at all levels of capability? It is important, indeed imperative, that the proposed Institutes provide for a range of students and student abilities and capabilities. This includes students with special learning needs, students who desire to transition immediately from career training to the workforce, and students who intend to pursue attendance at two- or four-year colleges or universities. It also includes students who elect to take advanced courses alongside Institute-specific coursework. This approach will require continuing strong cooperation and collaboration between CATEC and the various high schools.

Summary

This strategy recommends a model and focus for CATEC over the next five years. It aims to position CATEC as a vital, innovative partner in the educational and workforce development community in our region. Collaboration with PVCC forms the foundation for the model’s development and implementation, thus providing employers with an integrated approach to talent development and students with the promise of career studies that lead to real work opportunities. Because this is a five-year plan, the model will inevitably need to be adjusted as necessary to meet changing external and internal developments. Nevertheless, the following decisions are necessary to move toward the strategic model.

1. Approve the general structure of the model, which includes significant involvement by business and other external stakeholders.
2. Assign Dr. Adam Hastings with the responsibility to lead implementation of the strategic model. This means he will need administrative and institutional support for the everyday running of CATEC.
3. Approve the CATEC Steering Group to include community and business leaders as well as representatives from CATEC and PVCC. Dr. Hastings should recommend members.
4. Build on CATEC as a critical, agile CTE resource for the region. An agile organization has three important characteristics: a strong strategic awareness of its external environment, leaders who can adapt to changing needs, and flexible resources.
5. Continue to build the network of CTE units across all schools and strengthen the relationships among the units, as well as with their collaboration with PVCC and universities.

Implementing this plan will require enlightened and sustained leadership from CATEC, PVCC, and their boards, elected officials, employers and the community in general. Sustaining the public information campaign is an important ingredient of community support.
Endnotes


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