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Examining Career and Technical Education in National Guard Youth ChalleNGe Programs

In the United States today, at-risk youth—those who are at the cusp of academic failure and might drop out of high school before completion—face challenging prospects in the job market and in transitioning into adulthood. At-risk youth are more likely to come from low-income households, can be prone to risky behaviors, and are at much higher risk of arrest and incarceration. Without an intervention, some of these youth will struggle to keep a steady job, form healthy personal relationships, and stay out of trouble with the law.

The National Guard Youth ChalleNGe Program (henceforth called ChalleNGe), a quasi-military, 5.5-month residential program currently implemented in 39 sites across 28 states, aims to help at-risk youth ages 16–18 get their lives back on track by giving them another opportunity to earn a high school diploma or equivalency (i.e., General Educational Development [GED] certification, High School Equivalency Test [HiSET], Test Assessing Secondary Completion [TASC]) and develop the life skills necessary for successful transitions into adulthood.[1] Although all ChalleNGe sites implement initiatives that address what are called the eight core components,

KEY FINDINGS

- ChalleNGe program sites value career and technical education (CTE) but struggle with scheduling and time constraints.

- Most sites in the sample leveraged the dual-enrollment program funded by the state to expose cadets to CTE, but this was often limited to cadets enrolled in credit recovery or high school programs and was sometimes limited by logistical and transportation constraints.

- Work-based learning was not a common feature of CTE provision across ChalleNGe programs.

- Most programs preferred to provide CTE on their own campus, but they generally struggled with the facilities, equipment, and staffing requirements that would allow them to do so.

- Program sites with Job ChalleNGe in their state face both challenges and opportunities related to linking their CTE programming with Job ChalleNGe offerings.

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[1] For a more detailed description of the ChalleNGe program, see Wenger et al., 2017; Wenger, Constant, and Cottrell, 2018; and Constant et al., 2019.

sites vary somewhat in their approaches and in the range of programs they provide in support of those components.[2] An example of this diversity of approaches is in the range and intensity of career and technical education (CTE) offerings across program sites. For example, although many ChalleNGe sites provide training in general occupational safety as an introductory course to a wide variety of CTE careers, some sites go further by providing opportunities for cadets to gain more-specialized occupational training in such areas as food safety, forklift operation, and automotive maintenance. Typically, sites provide CTE as a supplement to the core academic offerings related to GED, recovering high school credits, or earning a high school diploma. As more ChalleNGe sites look to invest and potentially expand CTE, it is important to draw attention to the existing evidence base on CTE's efficacy as it pertains to success in school and beyond and refer to the experiences and lessons learned from ChalleNGe programs that currently provide CTE.

The Aims of This Report

The overall objective of this report is to descriptively examine current CTE approaches and practices at ChalleNGe sites, identify the key challenges that programs face in providing CTE, and draw implications from the literature on promising practices in implementing CTE. This report is intended to inform programs' efforts to develop CTE and integrate it into their programming activities.

This report will be of interest to ChalleNGe program staff, personnel providing oversight for the program, policymakers, youth-serving providers and educators, and researchers concerned with designing effective youth programs for at-risk youth or determining appropriate metrics by which to track progress in occupationally focused youth programs.

We document the variation in CTE across sites, including the extent to which it reflects adaptation to local labor markets and other conditions or is idiosyncratic, as well as the extent to which current offerings reflect practices supported by evidence. Although the goal of this study is not to develop specific recommendations, we document the experiences among sites that currently provide CTE to inform other programs' potential future CTE intentions and plans. Moreover, an increasing number of states have or will soon introduce the Job ChalleNGe program, which is a postresidential program in which ChalleNGe graduates can acquire job-ready skills by taking occupationally based courses that provide the foundation and preparation for industry-based certification, a college degree, and job placement.[3] Identifying the potential linkages between CTE offered at ChalleNGe with Job ChalleNGe offerings is a critical component of implementation planning and success.

Organization of the Report

In the next section, we describe our approach to the study, including the data sources, the method of data collection, and the analysis. We then describe the policy background related to CTE and delineate promising practices from the CTE literature. We provide general information about CTE take-up and offerings at the ChalleNGe sites and make rough comparisons with a program that provides training to at-risk youth. We review the findings from our interviews with select ChalleNGe sites, citing evidence of the implementation of promising practices identified in the CTE literature. We conclude this report with a section on policy implications and considerations.

Study Aims and Approach

For this study, we aimed to address the following three key research questions:

1. What are the promising practices from the literature that could inform National Guard Youth ChalleNGe CTE implementation?

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[2] The eight core components are (1) leadership and followership, (2) responsible citizenship, (3) service to community, (4) life-coping skills, (5) physical fitness, (6) health and hygiene, (7) job skills, and (8) academic excellence.

[3] See California Jobs Challenge Program, 2020.

2. To what extent do ChalleNGe participants engage in CTE, and how do participation and offerings compare with similar programs?
3. What are examples of promising practices in CTE provision across ChalleNGe sites, and what approaches have sites taken to address implementation challenges?

Ultimately, a key goal of this research is to provide information about how sites in different environments can (or actually do) optimize approaches for CTE practices and outcomes.

We took a three-pronged approach to address our research questions and achieve our aims: (1) review the CTE literature to highlight promising practices drawn from existing research, (2) examine patterns of CTE engagement reported by ChalleNGe sites and those reported by a national job training program, and (3) conduct interviews with selected sites engaged in CTE to delve into greater detail in their CTE practices. We provide more detail on each of the three approaches below.

Identifying Promising Practices from the Literature

We looked to the literature on CTE to identify promising practices, focusing on well-regarded reference sources and keyword searches using Google Scholar. Where possible, summary materials drawing on prior research were used. We identified promising practices that would be relevant to the ChalleNGe program and included programmatic lessons from adult education and training programs and specialized high school programs (e.g., career academies that focus on specific CTE-related career clusters)[4] insofar as they might also relate to CTE and job training more generally. The literature search covered a range of studies that encompassed both qualitative and quantitative methodological approaches. Given the limited scope of rigorous quantitative work in this area, most

studies exploring promising practices in program design were qualitative. Although these were not explicitly addressed in the literature review, we wanted to be particularly cognizant of three factors in assessing the applicability of research on CTE in the ChalleNGe context: (1) the setting of CTE or job training programs, (2) the importance of the target population for CTE effectiveness, and (3) program design features that are associated with CTE effectiveness. The setting of CTE is important because many programs might have access to resources and networks that a typical Youth ChalleNGe academy might not. Thus, we wanted to acknowledge the effect it might have on the range of CTE offerings that could be made available. The extent to which the literature provided information on the target population was also important because ChalleNGe serves at-risk youth, and, therefore, research on training programs for at-risk youth could be especially informative. Finally, we were keen to identify the design features of programs and practices that could be linked to success.

Examining Career and Technical Education Practices from Data Reported by Challenge Program Sites

To describe CTE offerings across all ChalleNGe program sites and make comparisons, we leveraged data collected by RAND Corporation researchers each year from all ChalleNGe program sites. For this study, we relied on data from two of those years. The first group of data comes from the summer and fall months of 2018 and included ChalleNGe classes (or cohorts) 48 and 49, which were in session in the spring and fall of 2017, respectively. The second comes from the summer and fall months of 2019 and covers classes (or cohorts) 50 and 51, which were in session in the spring and fall of 2018, respectively. The annual data call, which covers a wide variety of topics beyond CTE, includes a set of questions on CTE offerings and cadet participation in CTE class-es.[5] We collected information on the number of CTE and college credits received, whether a cadet received

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[4] There are 16 recognized career clusters and 79 associated career pathways within those clusters. For more information, see Advance CTE, 2020. Advance CTE is a nonprofit organization disseminating resources to state CTE directors and the broader CTE-interest community.

[5] For a more-detailed description of the data collection method from ChalleNGe sites for the annual data call, see Wenger et al.,

a CTE certificate or other type of credential, and program-level information on the specific CTE and college courses offered. However, we were not able to cross-reference these data; for example, in cases in which a cadet is shown to have earned a CTE certificate, we could not determine which courses corresponded to that certificate. Across the two years, 30 of the 40[6] ChalleNGe program sites that were active in any class during this period reported some CTE activity as part of their program.[7] This includes 11 sites that reported CTE credits for some of the cadets and 18 sites that reported some cadets receiving credits or certificates. The remaining sites only provided information about course offerings at the program level and no information on credits or certificates received by cadets.

To provide a rough benchmark for ChalleNGe sites, we compared the data we captured on the ChalleNGe program with data from summary tables taken from a study that recently examined Job Corps (in 2016), a residential education and job training program for at-risk youth administered by the Department of Labor (Berk et al., 2018).

Interviews with Select ChalleNGe Sites About Current Career and Technical Education Practices

We conducted interviews over the phone in the spring of 2019 with a handful of ChalleNGe sites to understand in greater detail what type of CTE programming they provided and how they went about integrating CTE as part of their array of offerings.[8] To select the sites, we examined the data

collected from the classes or cohorts which were in session in 2017 and 2018 (collected from the sites in the summer and fall of 2018 and 2019) and identified sites with more-developed CTE in terms of the range of CTE classes offered and the rate of participation of cadets. We also selected sites to broadly represent diversity in terms of program size, geography and location, and years of operation. Although the age and enrollment size of the programs in the sample are broadly representative of the population of ChalleNGe sites, most of the sites selected are concentrated in the Southeast. Ultimately, we spoke with representatives of five program sites. We should note that, in the case of the Louisiana Youth ChalleNGe Program, our interview was primarily directed at learning about programming at one of the program sites (Camp Minden). However, a representative of the Louisiana Youth ChalleNGe Program state headquarters also participated, which allowed us to gain insights about all three Louisiana program sites (Table 1). For the purposes of this report, we consider our sample size of program sites interviewed to be five because our examination of CTE implementation in Louisiana was mostly focused on the Camp Minden site.

The RAND team developed a set of interview questions to explore the nature of CTE provision at each site (courses offered and means of offering them), rationale for those CTE courses, cadet eligibility and participation, accompanying career guidance and job placement supports, relevant partnerships with employers, and site-specific opportunities and constraints. We asked about

- types of CTE courses offered
- the approach to CTE—whether it conforms to a certain CTE approach or model
- the availability of career guidance provided to ChalleNGe cadets
- opportunities and challenges of implementing CTE
- relationships with community colleges and technical training institutions
- relationships with employers, industry groups, workforce development boards, workforce intermediaries, American Job Centers, and

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2017; Wenger, Constant, and Cottrell, 2018; and Constant et al., 2019.

[6] There were 40 sites for classes 48 and 49, but after the consolidation of the two programs in Texas, there were 39 sites for classes 50 and 51.

[7] Note that 30 sites reported CTE information in one or more of the following ways: Some cadets earned credits; some cadets earned CTE certificates; and some sites listed CTE courses in the program-level data. Because this is the first systematic effort to gather CTE information from all ChalleNGe sites, we were not able to determine whether missing data were due to survey nonresponse or to the absence of CTE offerings at the site.

[8] We typically spoke with the site director, deputy director, and instructional staff.

TABLE 1
ChalleNGe Program Career and Technical Education Interview Sites

Program Site	Location	Year Program Was Established	Number of Graduates from Class 48	Number of Graduates from Class 49	Number of Graduates from Class 50	Number of Graduates from Class 51
Appalachian ChalleNGe Academy	Grays Knob, Kentucky	2012	77	82	74	90
Florida Youth ChalleNGe Academy	Starke, Florida	2001	163	158	137	159
Grizzly Youth Academy	San Luis Obispo, California	1998	186	195	184	192
Louisiana Youth ChalleNGe Program—Camp Beauregard[a]	Pineville, Louisiana	1993	202	250	204	201
Louisiana Youth ChalleNGe Program—Camp Minden[a]	Minden, Louisiana	2002	207	213	204	174
Louisiana Youth ChalleNGe Program—Gillis Long[a]	Carville, Louisiana	1999	254	214	229	188
Milledgeville Youth ChalleNGe Academy[b]	Milledgeville, Georgia	2016	76	107	86	102

SOURCE: Administrative data from 2017 and 2018 ChalleNGe classes.

[a] The interview with the Louisiana Youth ChalleNGe Program was with staff of Camp Minden. However, participation from the state headquarters during the call allowed us to also gain insights into the CTE activities of the other Louisiana sites (Camp Beauregard and Gillis Long).

[b] The Milledgeville Youth ChalleNGe Academy was permanently closed in the summer of 2020.

related organizations to assist in program design, implementation, and job placement

- the availability of internships or other work-based learning (WBL) opportunities for cadets.

A member of the RAND research team took comprehensive notes during each interview. The interview notes were reviewed carefully by the team, and a two-pronged approach was taken to synthesize key findings. The first approach was to examine how CTE promising practices in the literature translated into CTE practices at our five focal programs. In addition to examining how promising practices translated into CTE implementation in the sites we spoke with, we also identified challenges and opportunities to providing CTE cited by those same ChalleNGe sites. To conclude, we offer implications and considerations for other ChalleNGe sites considering making investments in providing CTE.

Study Limitations

It is important to acknowledge the study's limitations. For one, ChalleNGe is unique as a quasi-military, 20-week residential program that aims to help at-risk youth ages 16–18 attain a high school diploma or its equivalent. CTE participation in the ChalleNGe context is not necessarily applicable to general high school or even to other programs for at-risk youth. Second, the data we collected on CTE through the annual data collection are limited, and some sites did not report any information. Because CTE is not a formalized part of the ChalleNGe model, it is possible that many more programs offer some type of CTE even if they did not report it.

Finally, our interviews were limited to five sites, and therefore they are not necessarily representative of all ChalleNGe sites.

Policy Background and Promising Practices in Career and Technical Education

The development of a robust empirical foundation to inform the implementation of occupationally focused education in schools had long been hampered by the heterogenous array of programs that get classified as CTE. For example, elective credits in basic computing skills meant to supplement traditional academic coursework are considered CTE (on the "less intensive" end of the CTE spectrum), as are highly structured sequences of courses leading to certificates in computer science (on the "more intensive" end of the CTE spectrum) (Downing, Bozick, and Dalton, 2008). Furthermore, schools employ different "wraparound" activities, such as resume writing, structured internships, and job shadowing, to augment CTE offerings. Programs can also be targeted to provide high school students with advance exposure to occupational careers, and they can be designed to engage at-risk or disconnected youth (U.S. Department of Labor et al., 2014).

With such variation in program intensity, corresponding wraparound activities, and targeted student populations, researchers initially struggled to make broad generalizations about the efficacy of CTE using existing national data sources that had only crude measures of CTE offerings and participation. This changed in the early 2000s during the lead-up and subsequent launch of the reauthorization of the Carl D. Perkins Vocational and Technical Education Act in 2006. Known colloquially as the Perkins Act, this legislation is the federal government's main vehicle for funding CTE programs. Similar to its predecessors (the Perkins Acts of 1984, 1990, and 1998), the integration of academic and technical skills and concepts is a centerpiece of the 2006 legislation (Perkins IV), challenging educators to develop innovative approaches to structure their curriculum in a way that best positions students to earn postsecondary credentials that expedite

entry into the workforce (Imperatore and Hyslop, 2017). Perkins was reauthorized in 2018 through the Strengthening Career and Technical Education for the 21st Century Act (Perkins V) and took effect on July 1, 2019. Under Perkins V, the federal government set aside $1.2 billion annually toward CTE over the next six years and places greater responsibility on states and school districts to design and implement CTE programs in public schools and monitor their effectiveness, consistent with the requirements of the 2015 Every Student Succeeds Act. Under Perkins V, states and school districts were required to submit four-year plans by the spring of 2020 to implement CTE.[9]

The reauthorization of Perkins in 2006 helped spur a new wave of research that was further sustained by the signing of Perkins V in 2018, buttressed in part by increased support from the U.S. Department of Education, which increasingly sought more-rigorous research to guide the direction of CTE programs as they evolved to effectively prepare students to compete in an economy that is increasingly reliant on science, technology, engineering, and mathematics (STEM) knowledge, skills, and abilities (Gottfried and Plasman, 2018; Arbeit, Leu, and Dalton, 2017; Dougherty, 2016; Downing, Bozick, and Dalton, 2008).

With this renewed focus on evidence extending from the 2006 Perkins Act, researchers sought to determine the components of CTE most essential to student success. Although still in its infancy, this burgeoning body of research has to date identified five promising practices utilized by CTE programs that show evidence of efficacy (see Table 2).[10]

These are considered promising practices, not best practices, because the research base on CTE is still in its infancy, and so most existing research

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9 See Advance CTE and Association for Career and Technical Education, 2018a, and Advance CTE and Association for Career and Technical Education, 2018b.

10 CTE research continues to grow, and grant funding from the U.S. Department of Education Institute of Education Sciences will continue to spur more research. The current research includes rigorous applications of experimental and quasi-experimental designs but also observational (noncausal) and qualitative evidence on the efficacy of certain CTE practices. As the research continues to grow and more evidence is brought to light, promising practices related to CTE are also likely to evolve.

TABLE 2

Promising Practices for Effective CTE Provision from the Research Literature

Promising Practice	Description	Sources
Structured career pathways	Most successful CTE programs are made up of a sequence of related courses in a career area or cluster.	Dougherty, 2018; Stone, 2017; Kemple, 2008; Kemple and Snipes, 2000; Stern, Dayton, and Raby, 2010; Karp et al., 2007
Career preparation activities	CTE that is complemented with career and counseling supports provides greater structure and focus to students.	Stone and Lewis, 2012; Hemelt, Lenard, and Paeplow, 2018
Work-based learning (WBL)	Applications of CTE learning in formal, supervised, and authentic job settings, such as an internship or apprenticeship, help cement skills.	Stone, 2017; U.S. Department of Labor et al., 2014; O'Connor, 2013; Field et al., 2010; Bozick and MacAllum, 2002; Bozick et al., 2019
Integrated academic-occupational curriculum	An integrated curriculum allows students to meet the requirements to attend college even while enrolled in a CTE-focused course schedule.	Stone and Lewis, 2012; Stone, Alfeld, and Pearson, 2008; Visher and Stern, 2015; Gentry, Peters, and Mann, 2007
Industry engagement	Education and industry partners working together toward a common goal can more effectively address challenges to closing skills gaps and promoting student success in the labor market.	Stone, 2017; Rosenbaum, 2001; U.S. Department of Labor et al., 2014

depicting the efficacy of CTE is correlational and suggestive rather than causal and definitive. These promising practices are a subset of the 2018 edition of the Association of Career and Technical Education (ACTE) Quality CTE Program of Study Framework (Imperatore and Hyslop, 2018).[11] That framework has 12 elements, and we consolidated a number of the elements to ease the presentation and take into consideration the unique constraints that ChalleNGe programs face.

We discuss each of the promising practices in more detail below.

Structured Career Pathways

Structured career pathways are structured sequences of courses and training that are meant to place students on a clearly defined "pathway" toward an occupational credential—such as a certificate, license, associate's degree, or some combination thereof. These pathways serve as a form of "high school major" in which the progression of courses that students take provides them with knowledge, skills, and abilities for a predefined career field in a hierarchical, sequential fashion. Historically, students took vocational education courses largely as electives, often toward the end of their tenure in high school. These electives would help students acquire credits toward graduation, but they lacked any real value in signaling to employers that students possessed job-specific skills. Moreover, they had no value in fulfilling prerequisites for postsecondary programs, even occupationally focused sub-baccalaureate programs (Stone and Lewis, 2012).

To remedy this, career pathways were introduced as a vehicle that provided structure to students' course-taking, particularly those who were not likely to pursue a bachelor's degree after finishing high school (Kemple, 2008; Kemple and Snipes, 2000). For example, a culinary arts career pathway could begin in 9th grade with a general nutrition course, followed by a healthy cooking techniques course in 10th grade that builds on the general course, and then a food-related business course (i.e., purchasing and cost controls) in 11th grade. For the pathway to serve as a bridge to postsecondary training, some of these courses will need to count as dual enrollment courses, providing credit toward high school graduation as well as toward a postsecondary credential. Additionally, dual enrollment exposes

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[11] For more information on the development of the ACTE framework, see ACTE, undated.

high school students to the demands and expectations of college-level courses. This dual enrollment element is a defining feature of a career pathway.

Though differences exist across studies, by and large, the evidence to date suggests that career pathways are beneficial to students. For example, in a study of career pathways implemented in three large urban school districts in three different states, Castellano et al., 2014, found that students in career pathways earned more credits and had a higher likelihood of graduating when compared with their peers. These promising outcomes appear to extend beyond high school. In another study employing a randomized control trial of nine career academies that essentially created schoolwide pathways for all students in nine urban school districts, Kemple, 2008, found that a treatment group consisting of career pathways students had higher earnings in the labor market after high school and a greater likelihood of being independent from their families in young adulthood when compared with a control group not enrolled in career pathways. The dual enrollment component of career pathways is particularly critical, as research finds that these opportunities lead to improved rates of high school completion and college enrollment (Karp et al., 2007).

Career Preparation Activities

Career pathways are expected to yield the most benefit if the courses offered as part of the predefined pathway are augmented with general career-preparation activities. The idea is that the formal courses of the career pathway provide core competencies in a specific career field, and other opportunities to gain general job skills and ideas about potential careers are available through activities such as job shadowing, career mentoring, resume writing instruction, and mock job interviews. The combination of formal career pathway coursework with corresponding career preparation activities was meant to provide structure and focus to students who were likely not going to pursue a bachelor's degree, with general skills that can help them in their short-term

part-time jobs and help them plan for their careers (Stone and Lewis, 2012; Kemple and Snipes, 2000).

Because career preparation activities are typically incorporated into the broader career pathway model, there are few studies that explicitly isolate the effects of these supplementary activities apart from the actual coursework in the pathway (Castellano et al., 2014; Kemple, 2008; Hemelt, Lenard, and Paeplow, 2018). For example, Castellano et al., 2014, which found positive academic outcomes associated with career pathways, and Kemple, 2008, which found positive labor market outcomes associated with career pathways, were both based on programs that provided career preparation activities. Similar findings are identified in Hemelt, Lenard, and Paeplow, 2018, a study of intensive whole-school CTE programs in one North Carolina county. That study found that students in the county who enrolled in CTE programs that included formal networking through the local chamber of commerce, resume preparation, mock interviews, job shadowing, and pre-internship training had higher rates of attendance, high school graduation, and postsecondary enrollment than students who were not part of the CTE program. Taken together, these studies lend suggestive evidence that the full benefits of CTE are partially realized by including supplementary career preparation activities.

Work-Based Learning

The efficacy of CTE courses is, in part, due to the extent to which the skills and concepts learned in the classroom can be directly applied in the workplace. To help crystallize these skills and concepts so that students understand them in the context of actual workplace tasks, some CTE programs have implemented WBL. This typically includes a supervised program sponsored by a school in collaboration with local employers that progressively links knowledge gained at an actual work site with the content of the CTE courses provided in the classroom (Bozick et al., 2019; Stone, 2017; U.S. Department of Labor et al., 2014; Stone and Lewis, 2012; Field et al., 2010; Bozick and MacAllum, 2002). WBL provides structured on-the-job training that occurs at a work site during regular work hours. This is often in the form

of an internship or apprenticeship-style experience in which students work under the direct supervision of the participating employer while receiving guidance that integrates and reinforces what is being taught back in CTE (O'Connor, 2013). WBL is distinct, however, from traditional internships and apprenticeships in that the on-site work experience is related to the CTE courses in which the student is enrolled, with the intent of having the formal coursework and the on-site job experience complement one another. Although WBL is not intended to lead directly to employment at the participating employer, it helps employers hire better-prepared applicants who understand the distinct expectations and culture of a particular job environment, thus saving recruiting and job training costs.

The research base on WBL suggests benefits to students. One of the more ambitious federal initiatives to develop WBL nationwide was the 1994 School-to-Work Opportunities Act, which provided states with seed money to initiate partnerships between businesses and schools. Unfortunately, most of the WBL programs were phased out after the original funding ran out, but some research showed that program participation was associated with better labor force outcomes after graduating from high school (Bozick and MacAllum, 2002). These promising findings are replicated in more-recent research. For example, in a study of a structured WBL program embedded into the CTE curriculum of New York City public high schools, program participants earned substantially more during the first year after high school graduation than similar peers who were not in the program (Bozick et al., 2019). Moreover, compared with nonparticipants, WBL participants were more likely to take jobs in the industry related to their WBL program during the first year after high school graduation (Bozick et al., 2019). These findings suggest that WBL is a critical component of a successful CTE program.

Integrated Academic-Occupational Curriculum Content

Integrating academic-occupational curriculum content refers to the explicit linking of concepts and skills taught in academic courses with those taught in occupationally based courses so that students understand how their classes apply to the challenges they could face in the workplace. Moreover, under this approach, students are, in principle, able to meet the requirements to attend college even while enrolled in a CTE-focused course schedule (Visher and Stern, 2015). Often referred to as *contextualized learning*, curriculum content integration is a pedagogical approach rooted in cognitive science research that finds that students learn more when the material is presented in the context of real-world applications (Karweit, 1993). This approach has causal evidence to support its efficacy: In a randomized controlled trial, students exposed to curriculum content integration were found to have greater improvement in math than their peers who were not exposed to the same. In this study, math and CTE teacher teams collaborated to identify where math intersected with CTE concepts (Stone, Alfeld, and Pearson, 2008). More generally, Visher and Stern, 2015, argues that an integrated academic and CTE curriculum in high school helped mitigate the potential stigma associated with pursuing CTE.

Because, historically, CTE has been a separate entity within schools or a secondary component of the overall curriculum, developing programs that integrate teaching across the subject areas has unique challenges. As Castellano, Stringfield, and Stone, 2003, p. 249, remarks, "vocational and academic staff often do not know each other well, much less collaborate with one another," reflecting the inertia of continued use of past pedagogical practices that preclude integrating academic-occupational curriculum content. Two studies that employed qualitative case study methods (similar to those used in this report) provide some insight into how integration operates in schools. Bodilly et al., 1993, conducted an analysis of eight high schools and found that integrated programs took quite a bit of time to implement and required a rethinking of traditional education conventions (i.e., the separation of the academic curriculum and the CTE curriculum). Johnson, Charner, and White, 2003, studied eight high schools and found that integrating curriculum content between academic and occupational courses was most successful when schools devoted their resources toward

a single occupational area rather than multiple ones. This success was reinforced when both academic and occupational programs were located at the same site (as opposed to different floors, buildings, etc.) and when there was strong leadership at both the school and classroom levels.

Industry Engagement

Ultimately, CTE programs are geared toward the future—preparing youth for life after high school. As the skills needed for success in the present economy have become more specialized, the need for coordination between employers and high schools has increased. Yet, research shows that employers and schools rarely communicate, creating a disjuncture between the needs and roles of both (Rosenbaum, 2001). As a result, students receive conflicting signals about what is expected for them to succeed in college and in work (Rosenbaum, 2001). For example, Rosenbaum, 2001, which studied 51 employers, found a general sense of frustration in the lack of basic math, writing, and communication skills of entry-level workers, yet the infrastructure of the American school system inhibits effective systematic partnerships between schools and employers—the key players in the production of human capital. Without a clear articulation of the exact competencies required in local industries, secondary and postsecondary curricula and instruction lack the necessary industry inputs that would prepare students to meet the needs of employers, particularly for those students who are not bound for a baccalaureate degree. Moreover, without such partnerships in place, employers often lack direct access to potential employees and thus miss key opportunities to socialize and educate students about the requisites for success in their respective companies.

Although rigorous evidence that points to the effectiveness of industry engagement is limited, there has been increasing emphasis for CTE institutions to involve and leverage industry resources to achieve a range of recommended goals. Education-to-industry partnerships have been pointed to as a means for identifying and closing skills gaps, aligning state and local programs with private-sector initiatives, and coordinating and pooling limited resources to achieve common goals (U.S. Department of Labor et al., 2014).

The most common way for school administrators to engage with college staff is advisory boards, though advisory boards were found to have little influence on the CTE curriculum (Bozick et al., 2008). Other means of engaging industry include developing cooperative education programs linked to occupational areas in which students can participate. Nonetheless, both secondary and postsecondary institutions struggle to manage competing demands on their time, state and school district requirements, and, in some cases, teacher resistance (Bozick et al., 2008, p. 27).

A case study analysis of an information technology–oriented career academy identified several key elements in maintaining education-to-industry engagement. The key elements included the establishment of mutual interest between the business community and the program to achieve a shared purpose and the appointment of a full-time career specialist with buy-in from school, district, and community stakeholders "whose sole responsibility was to bridge academy-community connections, relationships and supports" (Hernandez-Gantes, Brookins, and Fletcher Jr., 2017, pp. 32–33).

In the following sections, we provide an overview of CTE practices across all sites based on data collected from each site to cover practices in 2017, and then we delve into each of these five practices and describe how they are currently being utilized in the five ChalleNGe programs that we interviewed to gather more in-depth information on CTE approaches and practices. It is important to note that we did not see much evidence of some of the promising practices, such as WBL, academic-occupational content integration, and industry engagement, at ChalleNGe sites. Nonetheless, these promising practices are areas of opportunity for ChalleNGe sites to consider as they seek to expand CTE. Finally, we conclude with implications and considerations for ChalleNGe sites as they seek to offer CTE programs to their cadets. Moreover, as more states implement Job ChalleNGe, the implications of aligning CTE programming with Job

Overall Picture of Career and Technical Education Across ChalleNGe Sites

ChalleNGe is a unique program, which makes it difficult to identify appropriate benchmarks for comparing CTE participation among its cadets. The primary participants of ChalleNGe are youth who are experiencing academic difficulties and exhibiting problem behaviors inside and outside school; who have either dropped out or are in jeopardy of dropping out of high school; and, in some cases, who have had juvenile or criminal justice involvement. Cadets, as the youth participants are called, are required to participate in activities associated with eight core components that include not only taking academic courses and developing job-related skills but also participating in community service and physical fitness and following a quasi-military lifestyle. In those ways, a ChalleNGe cadet's daily routine and experiences during this 5.5-month period (including a two-week pre-ChalleNGe phase) differ markedly from the experiences of a typical high school student.[12] Furthermore, ChalleNGe sites are not situated within a school district or local neighborhood per se, and they also might have more-limited access to the types of community and parent resources that a typical high school would have access to.

Career and Technical Education Credits Earned

Our data reveal significant heterogeneity in CTE participation across ChalleNGe sites. We asked sites to collect two kinds of CTE information for each cadet: the number of CTE credit hours they received while at ChalleNGe and whether they received a CTE certificate. It is important to note that these are self-reported data from the sites, and the definitions of CTE credit hours and certificates are not necessarily consistent across sites or comparable to national benchmarks. We also allowed the sites to define CTE credit hours and certificates rather than imposing a national- or state-level definition.[13] Thus, the information that sites provided should be considered indicative of CTE participation and engagement. Table 3 shows the percentage of graduates from classes 48–51 who received CTE credits or certificates. The third column in the table restricts the sample to the 11 sites at which at least some cadets received CTE credits. As shown in the table, 15 percent of graduates across all sites were reported as having received any CTE credits. Notably, a number of sites offer courses awarding certificates that are not reflected in our data on CTE credits. Among cadets who did receive credits, most received two or more, with some reporting as many as 15. Similarly, most ChalleNGe graduates did not receive a CTE certificate while in the program, but among sites reporting some CTE credits, nearly half of cadets received one.

Comparing ChalleNGe with Job Corps

For the reasons described above, comparing ChalleNGe cadets' participation in CTE with that of other student populations is inherently problematic. Yet comparing ChalleNGe to some benchmark can help us identify idiosyncratic features of the ChalleNGe program as well as commonalities with other large national programs. National comparisons with programs that strive to achieve the same objectives could be helpful for ChalleNGe as it

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[12] For more details on ChalleNGe, see Constant et al., 2019; Wenger, Constant, and Cottrell, 2018; and Wenger et al., 2017.

[13] Note that CTE credit hours are typically awarded by a post-secondary institution, such as a community college, and could count toward a more advanced degree, such as an associate's degree. For example, dual enrollment programs allow high school students to enroll in a postsecondary institution to take courses that earn them credit hours that they can build on after graduating from high school. On the other hand, a certificate could be awarded by a postsecondary institution or by a training organization. There are many different types of certificates—they can range from certificates of course completion to industry-based certifications that demonstrate mastery of skills in certain occupational fields. In our survey, we used the phrase "credentials or certificates," with the intent of being broad in our definition. However, in this discussion, we use the word *certificate* to distinguish from credits, rather than the more expansive term *credential*.

TABLE 3

Career and Technical Education Participation Rates at ChalleNGe (Classes 48–51)

Participation	Graduates from All ChalleNGe sites (%)	Graduates from ChalleNGe Sites Reporting Some Cadets Receiving CTE Credits (%)[a]
Receipt of CTE credits		
Any credit	15%	65%
At least 1	14%	59%
At least 2	10%	43%
At least 3	7%	29%
Receipt of any CTE certificate	18%	46%

SOURCE: Administrative data from 2017 and 2018 ChalleNGe classes.

[a] Note that these percentages are restricted to the 11 sites that reported some cadets receiving CTE credits.

seeks to set itself apart in support of its recruitment, for example. We do not argue for ChalleNGe to emulate course offerings or how other programs approach education and training, but these types of comparisons might serve as useful guideposts for program practitioners.

To provide this comparison, we present demographic and course information for ChalleNGe alongside similar information from Job Corps, the largest residential job training program serving at-risk youth in the United States (Johnson et al., 1999; Berk et al., 2018). Data on Job Corps are derived from Mathematica's 2018 external review of the program and cover the 2016 cohort (Berk et al., 2018). Our ChalleNGe data cover classes 48–51, who attended the program in 2017 and 2018, and were collected from the sites in 2018 and 2019. Job Corps and ChalleNGe differ in significant ways: Job Corps accepts participants ages 16–24, is specifically focused on vocational training, and can last 18 months or more, depending on the specialization (Berk et al., 2018). ChalleNGe is open to 16- to 18-year-olds only,[14] and the residential and

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[14] There are some exceptions to this age range. A few 15-year-olds are accepted with waivers each year, and some cadets turn 18 while in the program.

educational portion lasts for 5.5 months, after which cadets are expected to be placed in a job, additional education, or the military.

Table 4 shows descriptive demographic statistics of three populations: the 2016 Job Corps cohort as reported in Berk et al., 2018; all ChalleNGe graduates with nonmissing data from classes 48–51; and the subset of those ChalleNGe graduates who reported having nonzero or nonmissing CTE credits or who reported receiving a CTE certificate. The table reveals a few notable differences between the three populations. Notably, the Job Corps participant population is older, has a higher share of female participants, and has a higher share of minority representation than is the case with ChalleNGe. In terms of the characteristics of ChalleNGe cadets who graduated having taken CTE, there is a slightly higher share of younger cadets who took CTE compared with all ChalleNGe graduates. African American cadets are less likely to be represented among students having taken CTE (or are less likely to reside at a site that reports offering CTE) than in the general ChalleNGe population, whereas CTE participation is higher among White cadets and slightly higher among Hispanic cadets than in the general ChalleNGe population. Average Test of Adult Basic Education (TABE) scores appear to be slightly higher among cadets taking CTE compared with the general ChalleNGe population. Note that because Job Corps' participants are older than the ChalleNGe population and the data available on Job Corps from the report are not broken down by age, it would not be appropriate to compare the overall TABE grade equivalencies across the two programs.

Table 5 shows the distribution of CTE programs at Job Corps and comparable courses available at ChalleNGe sites. To identify what CTE courses were offered at ChalleNGe, we asked sites to list the CTE courses and CTE certifications available to their cadets. We combined these lists and manually categorized courses into the subject areas reported for Job ChalleNGe. Although we are cautious in comparing the two groups and placing too much emphasis on the ChalleNGe data given the significant amount of nonresponse noted above, we make a few observations. Nearly all Job Corps sites offer some kind of construction program, but only seven (out of 39)

TABLE 4

Selected Demographic Characteristics of Job Corps and National Guard Youth ChalleNGe Cadets

		Students, Job Corps, 2016	ChalleNGe Classes 48–51, All Graduates	ChalleNGe Classes 48–51, Graduates with CTE Participation
Age at entry				
	17 or younger	23.20%	90.63%	92.22%
	18 or older	76.80%	9.37%	7.78%
Gender				
	Male	63.20%	76.29%	75.17%
	Female	36.80%	23.71%	24.83%
Race/ethnicity				
	Hispanic	18.40%	20.72%	21.61%
	White	23.90%	39.20%	47.20%
	African American	45.80%	27.06%	15.37%
	Other	11.90%	11.92%	14.96%
Highest grade completed[a]				
	Less than 9th grade	12.40%	2.23%	2.62%
	9th grade	15.10%	13.52%	11.94%
	10th grade	15.20%	26.60%	32.45%
	11th grade	14.60%	17.70%	25.18%
	12th grade	42.70%	7.60%	12.04%
Average TABE score at entry[b]				
	Reading	7.60	7.44	7.60
	Math	7.80	6.31	6.57

SOURCES: Berk et al., 2018, and administrative data from 2017 and 2018 ChalleNGe classes.

[a] Highest grade completed was not available for all ChalleNGe cadets; results are shown only for those with complete records.

[b] Averages for ChalleNGe are calculated only for cadets with valid scores.

ChalleNGe sites offer construction-related vocational courses. Most Job Corps sites offer a health care specialization, but just five ChalleNGe sites report offering courses in that field. Hospitality and manufacturing are the most represented subject areas at ChalleNGe in our data, with nine sites offering such courses, and we identified no ChalleNGe sites offering courses in transportation or retail sales and service.

We should note that patterns in course offerings between Job Corps and ChalleNGe are affected by the differential availability of courses that can be accommodated to a fast-paced, 5.5-month schedule. For example, several ChalleNGe sites offer ServSafe food handling and OSHA 10 certificates, but fewer sites offer certificate-granting courses in, for example, health care and construction. Offering these options in ChalleNGe reflects not only a belief

TABLE 5

Availability of Selected Courses, Job Corps and National Guard Youth ChalleNGe Program

Subject Area	Percentage of All Centers, Job Corps, 2016	Examples of ChalleNGe Courses
Construction	96.7%	• Beginning construction, including National Center for Construction Education and Research certification • Forklift operator • Backhoe operation • Masonry • Scaffolding/fall protection • Overhead hoist • Beginning electrical
Health care	83.7%	• Patient care technician • Phlebotomy • Cardiopulmonary resuscitation (CPR) • Certified nursing assistant
Finance and business	68.3%	• Certified management accountant • Microsoft Office • Introduction to clerical and office work
Hospitality	65.9%	• ServSafe food handling and preparation • Cake and cookie decoration
Advanced manufacturing	50.4%	• Industrial manufacturing and welding • Industrial maintenance • Heavy equipment operator • Robotics
Automotive and machine repair	38.2%	• Auto mechanics and auto body repair • Small engine repair
Security	37.4%	• Occupational Safety and Health Administration (OSHA) 10 certification • Community emergency response team training
Transportation	31.7%	N/A
Information technology	24.4%	• Fundamentals of information technology
Renewable resources and energy	18.7%	• Gardening
Retail sales and service	14.6%	N/A
Communications	N/A	• Visual arts and media production • Photography
Child and elder care	N/A	• Child care • Early childhood development
Cosmetology	N/A	• Cosmetology • Barbering
Textiles and furnishings	N/A	• Bath products

SOURCES: Berk et al., 2018, and administrative data from 2017 and 2018 ChalleNGe classes.

among program officers about the potential value of those certifications in the labor market but also the ease of fitting them into the ChalleNGe curriculum.

Implementation of Career and Technical Education in Select ChalleNGe Sites

In this section, we will discuss the findings around CTE implementation in select ChalleNGe sites organized around the promising practices (see text box below). As noted in the overall picture of CTE across ChalleNGe sites, the majority of sites did not report providing CTE to cadets, but some sites do, and participation is high. There are a number of possible explanations for why ChalleNGe sites do not provide CTE at the same level as, say, U.S. high schools. The factors underlying this difference are explored in the interviews with the ChalleNGe sites. One consistently cited reason during our phone interviews for the limited offerings is the difficulty that ChalleNGe sites face in integrating CTE into a compressed and intensive 5.5-month program. Program personnel noted that cadets are focused on catching up to recover high school credits, complete their high school diploma, or earn a GED, limiting the resources and time available for meaningful CTE options, according to our interviewees. Cadets are also participating in other activities to fulfill the remaining core components, and sites face significant logistical, technical, and funding challenges to providing CTE opportunities for cadets. Although some ChalleNGe sites have the advantage of close proximity to a community college or other training center to easily transport cadets or bring in instructors to provide CTE, other sites face logistical obstacles that place significant pressures on scheduling and funding transportation to allow cadet participation in CTE.

In the remainder of this section, we cite examples from our conversations with selected interview sites in the spring of 2019 about their approaches to implementing CTE, organized by the promising practices highlighted from the literature. It is important to note that the activities reported by the sites below were in place as of spring 2019 and might have changed since then.

Some Aspects of Career Pathways Were Incorporated

Given the positive outcomes associated with career pathway participation, it is encouraging that three of the five programs (Milledgeville Youth ChalleNGe Academy, Grizzly Youth Academy, and Camp Minden) we interviewed had incorporated career pathways as the cornerstone of their CTE program offerings. For example, at Milledgeville Youth ChalleNGe Academy, students took dual enrollment courses at Central Georgia Technical College in barbering, computers, and medical terminology.[15] Cadets can transfer these earned credits to any college in Georgia so that they can continue toward a postsecondary credential after the completion of the program. Similarly, Camp Minden offers up to 15 credit hours en route to an industry-based certification via a partnership with the Louisiana Community and Technical College System in automotive mechanics, auto body repair, construction, office procedures, marketing/retail, web design, culinary arts, and broadcasting. It is worth noting that, given the short-term nature of the ChalleNGe program, these offerings are a truncated career pathway and so provide only a portion of the job training exposure that would be made available to students in a comprehensive high school. It is also worth noting that all three ChalleNGe programs with career pathways utilize local community colleges to administer the courses. Courses are not provided by high school CTE teachers, and so these differ somewhat from the pathway experiences of students in traditional comprehensive high schools, where CTE and traditional academic teachers collectively plan the curricula to ensure that occupational concepts are integrated into academic courses and vice versa.

Career Preparation Is a Regular Feature of ChalleNGe

All ChalleNGe programs provide career preparation activities as part of the job skills and academic excellence core components. All cadets are required

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[15] Note that the Milledgeville Youth ChalleNGe Academy permanently ceased operations as of summer 2020.

to fill in a Post Residential Action Plan that outlines their goals (work, college, etc.), and then they receive related forms of support, such as help on college applications and mock interviewing. At the time of the interviews, personnel at two of the programs we interviewed offered supplementary career exploration and job training activities explicitly tied to cadet participation in CTE. At Milledgeville Youth ChalleNGe Academy, local business owners and community members stage mock job interviews with cadets. At Grizzly Youth Academy, students enroll in a one-credit dual enrollment course on career planning that covers topics such as how to fill out job applications and how to prepare for an interview. This course results in the production of a career portfolio that includes a resume that students can use to apply to jobs. Additionally, cadets at Grizzly Youth Academy get food handling and first aid certifications to bolster their general employability. Both of the CTE programs at Milledgeville Youth ChalleNGe Academy and Grizzly Youth Academy had structured career pathway programs with dual enrollment that these career preparation activities augment. It is worth noting that these career preparation activities at these sites were made available to all students, not just those who were enrolled in CTE.

Work-Based Learning Opportunities Were Difficult to Schedule

Of the five programs we interviewed, only Grizzly Youth Academy reported at the time that it had a full-fledged WBL component in its CTE program. Toward the end of the CTE program, approximately 25 percent of cadets at Grizzly Youth Academy participated in unpaid internships at partner businesses in the local community. Cadets who will leave the program with a high school diploma, GED, or HiSet are prioritized because they are likely to be entering the workforce (as opposed to credit recovery students, who are expected to return to their high schools to earn their diplomas). These internships last four hours a day, four days a week, for four weeks, and they range from internships in construction and automotive to retail and restaurant service to administrative positions in offices.

Despite the compressed time period in which cadets are enrolled in the program, Grizzly Youth Academy has explicitly emphasized CTE as a focal element of its curriculum. Therefore, it is not viewed as an add-on but, rather, as an essential program component. The sustainability of the WBL model has been made possible by Grizzly Youth Academy's long history (more than 20 years) of recruiting employers one by one to build up its network of opportunities for cadets. It has to coordinate transportation logistics, at times requiring that participating employers be near to one another. In addition, Grizzly Youth Academy coordinates with the local workforce board to identify living wage jobs in the region as a way to focus its broader CTE efforts on jobs that help the cadets gain a stable foothold in the workforce upon graduation. As a precursor to the WBL component, Grizzly Youth Academy also spends the first month of Youth ChalleNGe preparing cadets to develop soft skills, which employers have stated are generally lacking among entry-level employees. This type of attention to employer demand can promote easier transitions and better experiences for both the cadets and the employers providing WBL opportunities. It is worth noting that although it is possible to have a functioning WBL component of CTE within the compressed time frame of ChalleNGe, it does take some time for programs to develop these relationships and consistently incorporate work experiences into a cadet's schedule, as evidenced by Grizzly Youth Academy's 20-year investment.

Though not quite at the scale of Grizzly Youth Academy's program, Florida Youth ChalleNGe Academy provides opportunities for students taking agricultural courses to work in an on-site greenhouse. This gives cadets exposure to tilling land and planting crops while providing them real-world instruction on planting, cutting, and composting.

Integrating Academic and Occupational Curriculum Content Did Not Occur

None of the five sites that we interviewed for this report had formally implemented academic-occupational content integration into

their CTE programs. This is likely because four of the five programs rely on community colleges to provide CTE courses. Because these courses are designed and implemented at the colleges and geared toward college students, there is not an opportunity or reason for college instructors to coordinate with academic instructors at the high school to systematically coordinate course content across CTE and academic courses. Moreover, there were logistical challenges for staff representing different institutions to purposefully integrate their curricula. In GED-focused programs, cadets typically utilized a national standardized curriculum not designed to be integrated with CTE curricula developed by a local community college. Sites offering credit recovery and high school diplomas had more flexibility to integrate curricula with CTE; nonetheless, cadets proceeded at different paces through these programs, and there was limited opportunity to integrate curricula together. Given the increasing focus on this approach to implementing CTE and its documented efficacy, ChalleNGe sites might want to consider ways that they can integrate academic and occupational curriculum content into their CTE programs.

Industry Engagement Was Limited

Among the sites we interviewed, only two of the five had extensive relationships with local employers. Grizzly Youth Academy works with the local community college, county workforce board, and local businesses with which it maintains contacts to identify living wage opportunities on which to base its selection of CTE courses to offer cadets. Grizzly Youth Academy reported having 20 years of organically developing partnerships, and this foundation gives it a strong network of employers with which to discuss industry needs and to assist with job placement. This network has been developed and sustained in part by its internship program, and, among the five sites we examined, is the only site at the time of the interview with such a formal program. The Louisiana sites maintain loose relationships with employers across the state but more-structured relationships with select local employers. The remaining sites noted occasional informal relationships with

employers, although these were not necessarily systematic and ongoing.

Opportunities, Constraints, and Means of Addressing Them Across ChalleNGe Sites

Each of the ChalleNGe sites with which we spoke identified a number of common constraints in terms of providing CTE opportunities for cadets. There were also constraints unique to certain sites. In addition, sites noted opportunities that they were currently leveraging or that were on the horizon because of increased national and state attention paid to CTE and cited examples of efforts to leverage state and local resources to provide CTE to cadets. In this section, we provide general impressions from our conversations on both the constraints and opportunities related to providing CTE in the context of ChalleNGe. Our observations focus on four main areas: (1) eligibility to participate in CTE, (2) scheduling, (3) facilities, and (4) funding.

Sites Set Different Eligibility Criteria to Participate in Career and Technical Education

According to personnel at the sites we interviewed, requirements to receive a GED or equivalent, credit recovery, and completing a high school diploma necessitated establishing criteria for eligibility to participate in CTE. For some CTE offerings, sites were able to offer courses to all cadets, but in other cases where seats were limited, they generally factored in results on the TABE test, progress on academic coursework, and behavioral indicators. Sites were explicit in their emphasis on a cadet's timely progress toward completing their academic requirements as their first priority, and some CTE courses were limited to cadets who were on track or ahead in completing those requirements. All the sites we interviewed offered cadets dual enrollment opportunities geared toward college credit in basic first-year college classes but then limited who could participate.

For example, Florida Youth ChalleNGe Academy offered an online course that introduces cadets to

basics in areas such as everyday electricity, electric technology, and safe food handling, as well as a program called "innovating solutions," which attempts to foster scientific inquiry and creativity through computer-based and hands-on design, building, and experimentation (Pitsco, undated). These experiences were offered to cadets online, and cadets could proceed through them at their own pace. The courses do not lead to certification, and they can be offered to a large number of cadets. Another course that led to Microsoft certification was limited in terms of seats, and thus both academic and behavioral indicators (as well as cadet interest) were taken into consideration. Florida Youth ChalleNGe Academy also offered dual enrollment, but only to cadets in the credit recovery or high school diploma program. Thus, students working toward a GED were not eligible to enroll.

Grizzly Youth Academy, where the vast majority of cadets are enrolled in either credit recovery or the high school diploma program, allowed cadets to participate in dual enrollment to obtain up to four college credits. The Appalachian ChalleNGe Academy used the TABE test to determine whether the cadet was eligible for dual enrollment in academic-focused classes offered through the Kentucky Technical and Community College System, based on the grade level they achieved. The Louisiana sites based the selection of cadets to participate in industry-based certification on TABE scores, positive interest in the program, a minimum age requirement of 17, and behavioral indicators. In the end, approximately 10 percent of cadets enrolled in each of the Louisiana sites ended up being eligible to participate. Cadets earned, on average, around 15 community college credits and an industry-based certification through this program. Milledgeville Youth ChalleNGe Academy allowed most cadets to take classes, although they were not guaranteed their first choice. Cadets at Milledgeville Youth ChalleNGe Academy who are struggling academically are not eligible to enroll in the dual enrollment program.

Scheduling Constraints Were the Biggest Obstacle to Expanding Career and Technical Education

The main constraints to expanding CTE are space on the ChalleNGe campus to set up facilities and the logistics of transporting cadets to and from the college campuses where they would be taking their dual enrollment classes. All the sites mentioned that they encountered some difficulties with fitting CTE into cadets' schedules. The farther a site had to transport cadets to take CTE classes, the more difficult it was to fit in CTE offerings. Cadets who were significantly behind on high school credits or who were struggling with their GED courses were less likely to participate in CTE. Requirements to transport cadets also limited the number of cadets who could participate. The Appalachian ChalleNGe Academy in Kentucky, for example, reverted to utilization of Blackboard online for cadets in dual enrollment because it was proving to be untenable to transport cadets to their classes. Milledgeville Youth ChalleNGe Academy transported cadets to attend dual enrollment classes in Milledgeville, but at the time of the interview it was also considering other options, such as renovating buildings to offer courses on the Milledgeville Youth ChalleNGe Academy's campus or transitioning into online delivery.

The other main challenge was identifying courses or course sequences that fit within a 16-week schedule. The entire ChalleNGe program is 5.5 months (22 weeks). After the first two weeks, which are focused on acclimation, this leaves a total of 20 weeks, of which the first few weeks typically consists of assessing cadets' incoming education levels and academic requirements. For example, staff at one program (Florida Youth ChalleNGe Academy) acknowledged that CTE programs that led to a certification typically required cadets to log 200 or more hours, and the maximum amount of time that cadets can do, given the length and requirements of the ChalleNGe program, is 160 hours. This effectively limited cadet exposure to CTE to noncredentialing offerings. Thus, Florida Youth ChalleNGe Academy decided to provide a non–credit-earning and non–certification-based curriculum that cadets can access online to explore STEM-focused CTE fields.

Our comparison of ChalleNGe with Job Corps, while meant to be illustrative given some of the fundamental differences between the two programs, highlights the implications of being constrained in the types of offerings that ChalleNGe sites can provide. For example, a small share of ChalleNGe sites offer CTE in construction and health care, which are more common offerings among Job Corps sites. To the extent that Job Corps is a benchmark for the types of skills that make cadets readily employable, ChalleNGe sites might want to consider how early exposure to CTE courses in these fields while at ChalleNGe could assist with future job readiness and career development.

Most Sites Preferred to Offer Career and Technical Education Onsite, But Their Lack of Facilities Was an Issue

By and large, sites we interviewed uniformly reported that they preferred to be able to provide CTE on their campuses to allow maximum schedule flexibility and limit the amount of time lost when transporting cadets to and from other locations to take their CTE courses. Some sites brought faculty to the campus to teach CTE (Florida Youth ChalleNGe Academy, Grizzly Youth Academy); however, these offerings to cadets were limited given the need for specialized equipment for certain types of CTE courses. Overall, setting aside the appropriate facilities resources was a big constraint reportedly faced by sites. Two of the Louisiana ChalleNGe programs, Camp Beauregard and Gillis Long, expressed the desire to offer community college classes at their campuses to avoid having to transport cadets.

Sites Leveraged State Resources to Provide Career and Technical Education

The main cost associated with providing CTE was providing transportation to and from a community college. However, should sites choose to develop facilities on campus, funding could become an issue. Each of the five sites we interviewed offered dual enrollment, and this was typically free for high

school students in each state in which sites were located. The Appalachian ChalleNGe Academy in Kentucky was pursuing AdvancED accreditation. Once awarded, this accreditation would make the program eligible to receive additional funding from the Department of Education, which has been emphasizing postsecondary sub-baccalaureate and technical fields. These offerings would supplement dual enrollment, in which students were already participating.

In addition to offering dual enrollment through the Central Georgia Technical College, the Milledgeville Youth ChalleNGe Academy collaborated with the Middle Georgia Consortium to access funding to provide additional CTE offerings. The Middle Georgia Consortium, made up of locally elected officials and the local area workforce development board, administers a grant from the Workforce Innovation and Opportunity Act.

Implications and Future Considerations

In this section, we discuss the implications and considerations for ChalleNGe programs based on the literature review findings and discussion with select ChalleNGe sites about the opportunities and challenges of providing CTE to cadets enrolled in the program.

Some Programs Approach Career and Technical Education as a Means for Developing Entry-Level Workforce Skills for Those Who Might Not Be Continuing on to Postsecondary Education

Given the constraints that all sites face in terms of the compressed calendar and the academic and other requirements spelled out in the National Guard Youth ChalleNGe Program Cooperative Agreement, there are limits to what programs can provide in terms of CTE and credentialing programs. Thus, the program sites with which we spoke offer training that could be completed well within the program schedule. The approach that program sites took was

to provide CTE opportunities that afforded some basic certification that cadets could use when looking for an entry-level job. Such basic certification could include food handling, first aid or CPR, OSHA, and basic forklift operation. These types of courses do not require a significant investment of cadet time but still provide cadets with a credential that could lead to an entry-level position or that could serve as a foundation for further education and training.

For those ChalleNGe sites that are looking to expand existing offerings or newly provide them, careful consideration of the time required to offer CTE courses needs to occur. Some CTE offerings would work well with the existing time and scheduling constraints that ChalleNGe sites face, and others require more time and would not provide sufficient knowledge or experience as a shortened course to be useful. ChalleNGe sites also have to balance those considerations with the preferences of cadets and the availability of providers to offer CTE courses.

Programs with Robust Career Guidance Resources Are Able to Match Cadet Career and Technical Education Choices with Their Interests and Long-Term Goals

Research points to effective and meaningful experiences for students in CTE when it is linked to participation in a formal CTE pathway. Students who dabble in CTE courses are unlikely to gain from the experience compared with students who take sequenced CTE courses in which they are able to build on their skills. However, students and cadets (in the case of ChalleNGe) might not know what their choices are or have a good handle on their long-term career aspirations, particularly given their previous school experiences and personal circumstances. Effective career guidance and supports are one means of guiding young people in their choices, and this is no less relevant when selecting a CTE career field. Thus, ChalleNGe programs could couple cadet choices of CTE career fields and courses with robust career counseling and advising.

Work-Based Learning and Community Service Experiences Can Be Leveraged to Develop Soft Skills That Are Needed for Postsecondary Education and Work

Employers have consistently emphasized the importance of soft skills, including teamwork, interpersonal interactions, and problem-solving, as critical complementary skills to the technical skills needed to perform on the job. Opportunities for cadets to acquire these skills can occur through formal classroom training even as part of the Basic Life Skills curriculum, but these can also be further acquired through both WBL and community-service activities, the latter in the form of volunteering, which is already one of the core components of ChalleNGe. ChalleNGe sites could leverage their existing relationships with organizations and community partnerships built through their service activities to develop WBL opportunities for cadets linked to their CTE choices. WBL opportunities, in particular, could be facilitated by building industry partnerships. Although this might be difficult for ChalleNGe sites, appointing an advisory board, capitalizing on mutual interests between ChalleNGe sites and local industry, and appointing a staff member whose responsibility it is to develop and maintain these relationships could be helpful. Moreover, the community service and WBL experiences that cadets receive are opportunities for them to develop their soft skills.

Additional Efforts Should Be Made to Seek Better Integration Between Career and Technical Education Courses and Academic Coursework

Integrating ChalleNGe academic coursework and CTE is a challenge. However, young people who are disengaged from academic coursework outside of ChalleNGe might also be disengaged within ChalleNGe. Introducing practical examples from the CTE world into academics could help stem that disengagement and promote further collaboration among instructional staff within ChalleNGe and

Use of Online Education Expands Career and Technical Education Opportunities for Cadets, Although It Has Limitations

A few programs circumvented the time consumed by transporting cadets to community colleges and training centers by offering dual enrollment classes online. In some cases, this might be the only viable option through which to expose cadets to CTE. Moreover, the COVID-19 global pandemic has forced both ChalleNGe and Job ChalleNGe programs and their education partners to explore online course offerings, potentially enhancing the capability of online learning. Overall, however, online learning in general should be viewed with some caution, particularly because of the limitations of taking CTE courses in that environment. CTE is meant to have a robust practical component, and although taking CTE online might mitigate some problems, in the long term, it might not provide the full CTE experience for cadets.

ChalleNGe Sites Should Continue to Leverage State and Local Resources

With the newly passed Perkins V law, opportunities to apply for state and local funding for CTE are likely to continue to grow. In addition to state government involvement, localities, workforce development boards, and community service organizations are all engaged in trying to incorporate successful CTE approaches to better prepare young people for postsecondary transitions. In many cases, public and private institutions, including industry groups, are seeking partners to implement programs, and ChalleNGe sites should consider multiple means of leveraging those resources.

Integration Between Career and Technical Education Offered at ChalleNGe and Job ChalleNGe Offerings Affords Programs New Opportunities in Career and Technical Education Design

Out of the five sites with which we spoke, one site was in a state (Georgia) that was already implementing Job ChalleNGe as part of the pilot program, and two of the other sites we interviewed were in states (California and Louisiana) that were planning on introducing Job ChalleNGe beginning in 2019. In all cases, sites were considering how best to offer CTE programming during the residential phase of ChalleNGe to align with Job ChalleNGe offerings. ChalleNGe sites in states that were already planning on or are considering introducing Job ChalleNGe in the future can leverage the career and counseling resources that they provide to guide cadets in their CTE choices during ChalleNGe. Although not all cadets will continue on to Job ChalleNGe, the opportunity allows them to more clearly see the relationship between the courses they take during ChalleNGe and the careers offered at Job ChalleNGe. Program sites will need to work through the alignment of career fields offered at Job ChalleNGe with their own. Job ChalleNGe sites might be just as limited in what they can offer as Youth ChalleNGe sites are because of the location and the availability of community colleges and training institutions offering those courses. This presents a challenge but also a unique opportunity to design CTE that provides cadets with a viable pathway to further their education and employment.

The opening paragraph (carryover) reads:

between ChalleNGe staff and local community colleges. It could be prudent to pilot this approach with one course and extract lessons learned that could be expanded further.

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About This Report

The National Guard Youth ChalleNGe program is a residential, quasi-military program for youth ages 16 to 18 who are experiencing difficulty in traditional high school. This report examines a specific aspect of this program: the provision of career and technical education (CTE) opportunities for program participants. The report relies on administrative data collected from all programs pertaining to their operations in 2017 and 2018, as well as interviews with select program staff in 2019. In this report, we highlight promising practices in CTE provision found in the literature. We look at data reported from ChalleNGe sites during 2017 and 2018 on cadet participation in CTE and compare them with information from another nationwide program that serves at-risk youth. Finally, we examine the extent to which promising practices in CTE are found in a handful of National Guard Youth ChalleNGe sites. Methods used in this study include a document review; descriptive analysis of the administrative data that the RAND Corporation research team collected from all ChalleNGe sites on enrollment, completion, credits earned, certificates and other credentials earned, and other program-level information; and phone calls with staff from a handful of ChalleNGe sites implementing CTE. This report will be of interest to ChalleNGe program leadership and staff. This report could also be of interest to policymakers, youth-serving providers and educators, and researchers concerned with integrating job skills in the design of youth interventions.

The research reported here was completed in October 2020 and underwent security review with the sponsor and the Defense Office of Prepublication and Security Review before public release.

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