



# cte engagement & student interests

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Equipping Students with 21<sup>st</sup> Century Skills  
to Achieve Career Fulfillment

By Ryan McGrew



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Advance CTE often describes Career Technical Education (CTE) as an educational option that provides learners with the knowledge and skills they need to be **prepared for college and careers**. We believe that CTE gives purpose to learning by emphasizing **real-world skills and practical knowledge** within a selected career focus. And, **CTE opens students' minds and hearts** to new experiences by exposing them to a variety of careers, starting in middle school, if not earlier.

But, for CTE to reach its full promise, we must stay focused on ensuring each student has **access to and the opportunities to succeed** in high-quality, **well-designed CTE programs** of study that cover a depth of **technical, academic and 21<sup>st</sup> century skills**. While students may benefit from taking a CTE course or two, as this white paper demonstrates, the true impact can be found when students complete a **rigorous, intentional sequence of courses** that are aligned across high school and postsecondary, validated by industry, and anchored in a credential of value. It is through these experiences and pathways that students can **truly be prepared** for careers, college and in the 21<sup>st</sup> century."

**Kate Blosveren Kreamer**

*Deputy Executive Director*  
Advance CTE

# executive summary

Students today face significant challenges in preparing for their future careers. The evolving nature of the economy presents those in the early stages of career planning with a moving target, effectively forced to take an anticipatory approach when considering potential educational pathways.

To succeed in such an economy, students must develop “21<sup>st</sup> century skills,” i.e., interpersonal skills, problem solving, and technical understanding of the tools that business and industry most value. At the same time, learners should also be aware of labor market trends when considering their next steps.

In examining research focusing on student exploration and career preparation, it is evident that engagement in career and technical education (CTE) programs helps to strengthen ability and understanding in these key areas.

In exploring student outcomes with respect to career utility, satisfaction, and retention, research suggests that informed exploration, self-awareness, and interest identification are highly conducive to student success as well.

The collective findings from these research areas indicate that those students who successfully identify their interests and plan accordingly to develop skills demanded within career environments that align to those interests realize the greatest benefit.

By contrast, those that engage in CTE coursework without a defined understanding of their career interests and goals are less likely to

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realize certain benefits. This is evident in observing data “comparing students who choose to take several different introductory vocational courses with those who take their courses in a linear sequence.” The data shows that those progressing to upper-level vocational courses demonstrate higher rates of academic completion and earning potential, as opposed to those enrolling in different introductory CTE courses with an undefined path. In the context of a rapidly changing economy, students must be able to understand and align their interests to professional environments in a universal way.

Research emphasizes that Holland Theory provides a robust method of doing so (Harris-Bowlsbey, 2016). This paper references existing literature discussing student career preparation through CTE and expands upon the process whereby career interests can be used to inform “21<sup>st</sup> Century Skill” development and maximize occupational utility for students in the modern economy.

# challenges facing students

“Technological advancement and innovation have placed pressure on the average American job seeker.”

In recent years, global competition and socioeconomic forces have transformed the nature of work. Drs. Rojewski and Hill have proposed a framework for developing and implementing career preparation programs that address the rapidly changing workplace of the 21<sup>st</sup> century. In their paper, *Positioning Research and Practice in Career and Technical Education: A Framework for College and Career Preparation in the 21<sup>st</sup> Century*, the authors state, “Keywords to describe the emerging workplace are unpredictability, rapid change, and instability.”

Specific obstacles include “societal barriers to vocational preparation and change (e.g., lack of attention to career issues in public education, limited support for adolescents as they transition from school to postsecondary and work), and economic forces (e.g., uncertain about nature of work in future, and job shortages and stagnant economies) that are shaping our efforts and the world of work” (2014).

Technological advancement and innovation have placed similar pressure on the average American jobseeker. Job polarization refers to “the phenomenon where middle-skilled jobs are hollowed out, whereas lower-skilled service jobs and high-skilled jobs increase disproportionately.

This is due to the fact that many middle-skilled jobs (e.g., office administration, machine operation) consist of cognitive or manual tasks that can relatively easily be automated with recent technology because they follow precise, predictable procedures” (Hirschi, 2017).



# cte engagement & 21<sup>st</sup> century skills

**T**o achieve professional success in the modern economy, students will need to be equipped with 21<sup>st</sup> century skills. “More and more, work in the 21<sup>st</sup> century is demanding this same set of skills of all workers, not just a select few. The more emerging technologies become integrated into the workplace, the greater the need for innovation. Decision-making, problem solving in ill-structured settings, and application of technologies in novel ways to address problems will increasingly be the currency of valued workers” (Rojewski & Hill, 2017).

Literature on CTE in practice shows that those programs have incorporated work-based learning provide students with “opportunities to build particular skills (e.g., technical, personal, and social competence) as well as gain knowledge of the labor market and potential career pathways” (Ryken, 2006).

In examining specific cases in which students participating in CTE programs are provided with the opportunity to develop these technical, personal, and social competencies, they demonstrate a desire to do so. “The range of student experiences reported in the case studies reveals that education/career decisions evolve over time and are tied to experiences in the labor market and suggest that there is a complex interaction between students’ needs and interests and program structures. Consistent with Chen’s [2003] concept of career, students participating in CTE programs gain experiences, actively shape and are shaped by contextual factors, and learn about themselves” (Ryken, 2006).

# cte engagement & student interest alignment

**C**TE programs provide students with the opportunity to develop and apply skills that are crucial and transferable with respect to the modern workplace. However, to maximize long-term success, students must consider how they can harness these skills in a way that aligns with their personal career interests and their long-term career goals.

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Common misrepresentations of outcome data associate lower academic performance and outcomes with students engaging in CTE coursework largely because CTE had previously been considered a non-college path.

Kreisman and Stange note that, “high school curriculum is becoming increasingly prescribed, meaning that increasing graduation requirements that induce students who would have taken upper level vocational courses to take fewer may not be welfare-enhancing. Further,

states are moving toward a model of vocational coursework where students complete “pathways,” usually a sequence of three courses aligned with skills in a specific industry or occupation. Thus, while CTE courses are being squeezed by other graduation requirements, CTE itself is focusing more on depth as opposed to breadth.”

While it may be assumed that focusing on CTE pathways may cause a crowding-out of academic subject or electives that contribute to positive outcomes, Kreisman and Stange’s modeling indicates this is not the case. Controlling for other exogenous factors, the taking of upper-level vocational coursework “does not crowd out other courses which also have impacts on wages”, nor does it produce an adverse effect with respect to college completion.

The previous distinction is evident in observing completion data for those that pursue a defined pathway within CTE. “Conditional on enrollment, students earning more upper level vocational credits are more likely to graduate by nearly two percentage points,” compared to those taking only introductory vocational courses in a non-linear sequence.

With respect to postsecondary success, students whose course loads contained greater shares of CTE courses were “marginally more likely to graduate from two-year schools by about six percentage points for each 10-percentage point increase in upper vocational share.”



The researchers note that the outcomes stemming from CTE engagement and course completion are “suggestive of a learning process where vocational coursework provides students with valuable labor market skills and additional information about their comparative advantage in the vocational or college labor market” (Kreisman & Stange, 2017).

A second misconception concerns the return to CTE engagement with respect to wages. Again, researches find that those that progressed through a CTE pathway rather than having minimal CTE exposure enjoyed a two percent wage gain with each year of upper level vocational coursework.

Furthermore, “accounting for childhood circumstances, school type, and a host of other controls both explains away the entirety of the negative relationship between low vocational coursework and wages and increases the observed wage gains associated with upper level vocational courses.” This indicates that rather than hindering future

earning ability, those who progress successfully through advanced CTE coursework have greater earning potential (2017).

In summary, positive benefits with respect to completion, performance, and potential wages are actualized only by those that engage in CTE coursework as an academic pathway, rather than doing so peripherally.

National Center for Education Statistics (NCES) data show that “pathway” CTE completers report having a job within their career path at higher rates than low-completers and non-CTE focusers across all education levels (NCES, 2012). Thus, the understanding of one’s interests and planned skill development through CTE is integral in maximizing tangible benefits and job utility.

Student interest in the context of work environments is comprehensively understood through John Holland’s theory of vocational choice. This theory is “one of the most frequently cited contributions to the social science research literature and the validity of its basic tenets is supported by the findings of literally hundreds of studies” (Feldman, Smart & Ethington, 2008).

Through assessment, students are equipped with an understanding of their career-related interests and can then see how they align to various work environments that reflect those interests across industries and education levels. Research indicates that the pursuit of careers aligning to one’s Holland interest areas result in improvements in career-related ability and an increase in initial interest level (Feldman et al, 2008).

Additionally, Holland interest areas are shown to be a significant predictor in entry-level employment for students, where those working in environments reflecting their interests demonstrated greater persistence (De Fruyt & Mervielde, 1999).

# implications & conclusion

**G**rowing uncertainty surrounding the nature of the modern job market and the devaluation of traditional workplace skills presents a significant challenge to students. Macroeconomic forces have increased the rate at which occupations – and the skills they require – evolve.

This trend requires students to be more prepared by engaging in education and training programs that are conducive to 21<sup>st</sup> century skills; communication, critical thinking, and technical understanding of modern tools are essential as repetitive manual or cognitive job functions are being phased out.

CTE programs, as previously described, provide students with ample opportunities to develop these skills. A defined path within these types of programs has shown to result in improvements in academic completion, achievement, and well-being for students that have considered their interests when creating academic plans.

Consideration of student interests in the context of a CTE pathway yields the significant benefits that improve the likelihood of gainful and personally fulfilling employment.



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