CAREER AND TECHNICAL EDUCATION

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Career and technical education is a term applied to schools, institutions, and educational programs that specialize in the skilled trades, applied sciences, modern technologies, and career preparation. It was formerly (and is still commonly) called *vocational education*; however, the term has fallen out of favor with most educators.

Career and technical programs frequently offer both academic and career-oriented courses, and many provide students with the opportunity to gain work experience through internships, job shadowing, on-the-job training, and industry-certification opportunities. Career and technical programs—depending on their size, configuration, location, and mission—provide a wide range of learning experiences spanning many different career tracks, fields, and industries, from skilled trades such as automotive technology, construction, plumbing, or electrical contracting to fields as diverse as agriculture, architecture, culinary arts, fashion design, filmmaking, forestry, engineering, healthcare, personal training, robotics, or veterinary medicine.

Career and technical education may be offered in middle schools and high schools or through community colleges and other postsecondary institutions and certification programs. At the secondary level, career and technical education is often provided by regional centers that serve students from multiple schools or districts. For example, the Boards of Cooperative Educational Services in New York administers a network of 37 regional career and technical education centers that serve students throughout the state. Many states have similar regional centers or statewide networks that operate as part of the public-school system.

In some cases, career and technical education is provided through a high school, where it may or may not be an integrated part of the school's regular academic program. Students may also attend separate career and technical institutions for part of the school day, or a regional center may be the primary school of enrollment, where students take both academic and career and technical courses. In other cases, career and technical programs may take the form of a distinct "school within a school," such as a **theme-based academy**, that offers an interdisciplinary or career-oriented program in which academic coursework is aligned with specific career paths, such as culinary arts, nursing, or engineering.

Reform

Some educators and school-reform advocates argue that career and technical education is an underutilized **learning pathway** that could help to increase the educational engagement, achievement,

and attainment of students who are not excelling in more traditional academic programs. The practical learning experiences that are often provided in career and technical programs appeal to many students, and certain common elements—the focus on critical thinking, new technologies, real-world settings, hands-on activities, and the application of learning to practical problems, for example—align with a growing emphasis on **21st century skills**—skills that are relevant to all academic subject areas and that can be applied in educational, career, and civic contexts throughout a student's life. Advocates may also argue that career and technical education programs are an antidote to some of the weaknesses of traditional academic programs. For example, rather than learning from books, taking tests, and discussing abstract concepts in classrooms, students gain practical, relevant, marketable skills that will them more employable adults after graduation.

Over the past few decades, learning expectations for career and technical education have risen significantly, largely in response to the increasing sophistication of modern careers that are demanding higher levels of education, training, and skill from the workforce. For instance, yesterday's "auto mechanics" are today's "automotive technicians," and automotive programs now routinely provide training in the use of advanced computerized diagnostic equipment in addition to more traditional mechanical repairs. Students enrolled at career and technical centers, which are typically secondary-level public schools, are required to meet the same **learning standards** that apply to students in public high schools. In addition to state-required learning standards that apply to public schools, many states have developed standards specific to career and technical programs.

Debate

In the United States, career and technical education is often stigmatized, and there is a widespread perception that career and technical centers provide a lower quality education or that students who attend such schools are less capable or have lower aspirations. At least in part, these perceptions are lingering stereotypes associated with traditional "vocational" programs of past decades. There is no concrete evidence that such generalized perceptions and stereotypes are valid, and many studies have shown that students enrolled in career and technical programs can and do outperform students in more traditional academic settings.

Discussions about career and technical education also intersect with ongoing debates about academic "tracking," or the sorting of students into tiered courses based on past academic performance or perceived ability. Depending on its structure, academic requirements, and student demographics, a career and technical program can resemble an academic track in that certain types of students or certain educational outcomes may predominate. For example, lower-income students and minorities may be disproportionately represented in a program, or graduation rates and college-going rates may be markedly lower. Critics of tracking may argue that such results more than likely reflect the particular

structure and culture the **education system**, rather than an accurate representation of the abilities and aspirations of the students enrolled in the programs.

THEME-BASED ACADEMY

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A **theme-based academy** is either a stand-alone school or a distinct academic program housed within a larger school that emphasizes and builds its academic program around specific academic disciplines, professional fields, or career paths. A few common examples include schools and education programs that focus on science and engineering, information and technology, architecture and design, business and finance, health and social services, education and child development, hospitality and tourism, or the fine and performing arts.

Theme-based academies are largely secondary institutions or programs (grades 9–12), although some may include lower grades or serve younger students. Theme-based academies may be called *career academies* or *career-based academies*—the most popular form of themed academy—but they are usually distinct from **career and technical education** schools.

In some cases, theme-based academies operate similarly to "early college high schools," which allow students to graduate with both a high school diploma and an associate degree after five or six years of study. When a theme-based academy is housed in an existing school, the students enrolled in these "schools within a school" typically take a separate **core course of study** and pursue distinct learning opportunities, but they may take some courses—such as health, physical education, or art—with the regular student population. The academy students will also participate in the larger school's extracurricular, **co-curricular**, and athletic programs. Some theme-based academies offer four-year courses of study, while others offer only two years of themed-based study.

In both stand-alone schools and in themed-based programs that operate as extension of an existing high school, students typically follow a specialized academic program that integrates a specific academic or career theme into classes and coursework. For example, students may study science, technology, and engineering topics in their English, math, and social-studies courses. The course of study in such schools is typically designed to be both career and college preparatory—i.e., students receive an education that is

comparable to, or that exceeds, the level of academic challenge found in more traditional college-preparatory high school programs.

Students may also pursue additional academic- or career-themed projects and learning experiences, both inside and outside the classroom, such as internships, apprenticeships, job-shadowing experiences, volunteer opportunities, or field trips to local businesses, museums, performances, or social programs (for a related discussion, see **learning pathway**). Students may earn academic credit for these outside-of-school experiences, which may be required to complete the program or graduate from the school. Students may also be taught or supervised by both teachers and outside mentors—such as local business leaders, scientists, artists, or other professionals—and in some cases companies, organizations, or foundations may sponsor or partner with a theme-based academy, or a network of academies, to help the schools with funding, mentors, or career-related learning opportunities and work experiences.

Several national or regional organizations—such as the **National Career Academy Coalition**, **National Academy Foundation**, and **College and Career Academy Support Network**—are involved in supporting, operating, or promoting career-themed academies.

Reform

When theme-based academies operate within an existing school, they are often considered a form of "small learning community" or **learning pathway**, as well as a strategy for introducing **personalized learning** into the educational experience of students. Advocates of smaller, theme-based academies argue that integrating personal interests, career exploration, preprofessional preparation, and on-the-job learning opportunities, as well as other aspirations-building experiences, can increase student enthusiasm for learning, particularly for students who may be struggling or disengaged in more traditionally structured high schools. Theme-based academies are also promoted as a way to increase graduation rates, college enrollments, or postgraduation work placements and employment rates.

Debate

Some educators argue that theme-based academies and career academies, if they are not properly structured and administered, can inadvertently become a de facto form of "tracking"—i.e., the grouping of students based on perceived ability, past academic performance, or other factors. Critics of tracking contend that such grouping practices can create **inequities** in educational quality, increase **achievement gaps**, or perpetuate class and socioeconomic divisions, among other negative outcomes. Proponents would counterargue, however, that theme-based academies are often specifically designed to counteract such negative outcomes.

Theme-based academies have also been criticized for not delivering promised or anticipated results, such as failing to increase graduation rates, college enrollments, or postgraduation employment rates. It is important to note, however, that even though theme-based academies may share the "academy" label, most schools and programs are unique institutions that reflect a wide variety of designs and different levels of educational quality. Consequently, learning experiences are often not comparable from one theme-based academy to the next, and varying educational results, as with any general school or program design, are to be expected.

In addition, theme-based academies, specifically those housed within existing schools, may be criticized because they are more "themed" in name than anything else. In other words, high schools may create an "arts academy" or "STEM academy" that is only minimally or superficially built around a specific academic or career theme. In these cases, the course of study and teaching practices used in the "theme-based academy" may vary relatively little from the content and teaching offered in the regular school program. Critics of such academies would likely argue that the "theme-based" label is misleading, since the learning experiences provided to students are not substantively different in content, instruction, or quality from the school's regular course of study. On the opposite end of the spectrum are schools such as the Boston Arts Academy, for example, a public school in Massachusetts that integrates intensive arts-related content and instruction into every course and program.

EDUCATION SYSTEM

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The term **education system** generally refers to public schooling, not private schooling, and more commonly to kindergarten through high school programs. Schools or school districts are typically the smallest recognized form of "education system" and countries are the largest. States are also considered to have education systems.
Simply put, an education system comprises everything that goes into educating public-school students at the federal, state, or community levels:

- Laws, policies, and regulations
- Public funding, resource allocations, and procedures for determining funding levels
- State and district administrative offices, school facilities, and transportation vehicles
- Human resources, staffing, contracts, compensation, and employee benefits

- Books, computers, teaching resources, and other learning materials
- And, of course, countless other contributing elements

While the term *education system* is widely and frequently used in news media and public discourse, it may be difficult to determine precisely what the term is referring to when it is used without qualification, specific examples, or additional explanation.

Like the teaching profession, education systems are, by nature, extremely complex and multifaceted, and the challenges entailed in reforming or improving them can be similarly complex and multifaceted. Even reforms that appear to be straightforward, simple, or easily achieved may, in practice, require complicated state-policy changes, union-contract negotiations, school-schedule modifications, or countless other conditions. For a related discussion, see **systemic reform**.

> Given its widespread use and universal familiarity, the term *education system* can fall prey to what psychologist call the "illusion of knowledge"—or the tendency for people to think they have a better understanding of something than they actually do. For example, most people would say they understand what a teacher is and does, yet—if pressed—many people would not be able to explain precisely what people need to do to become certified as teachers, how state policies and requirements may dictate or influence what teachers teach in a course, what specific instructional methods are commonly used by teachers and which seem to work best, how educational research informs new instructional approaches, or how certain kinds of **professional development** can improve teaching effectiveness in a school, among many other things. When investigating or reporting on education reforms, it may be useful to look for more concrete, understandable, and relatable ways to describe abstract concepts such as *education system*.