In the following report, Hanover Research investigates innovative redesign models for high school education. This report is intended to offer a broad overview of successful strategies for improving students’ academic outcomes and social and emotional well-being. It draws from academic literature and also examines school redesign initiatives across the country.
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EXECUTIVE SUMMARY AND KEY FINDINGS

INTRODUCTION

Rockwood School District (RSD) has asked Hanover Research (Hanover) for a report on redesigning the high school experience. Numerous experts have argued in recent years that high schools are trapped in an antiquated system that does not attend to students’ contemporary academic, social, and emotional needs. Their work highlights the need for innovative and updated systems of learning designed to help high school students succeed in the 21st century. According to the Stanford Social Innovation Review, “it [is] time to boldly reimagine the high school experience—using the power of human-centered design, the latest adolescent neuroscience, and purpose learning—to usher in a new era of education that prepares students for this century, not the last.”

Research overwhelmingly suggests that the most effective high school redesign efforts consider a wide range of topics that address multiple aspects of student learning. Some education experts view this multidimensional approach as the creation of a comprehensive “learning environment,” in which high schools foster regular interaction, collaboration, and opportunities for both formal and informal learning throughout the school day. Ideally, these new learning frameworks should aim to “address the multiple and interconnected learning needs of the whole child.” In this way, merely adopting a new curriculum or offering redesigned courses is not sufficient to meet the needs of 21st century learners.

The US Department of Education (USDOE) agrees with these assessments of the educational system, and published a Fact Sheet in 2013 entitled “Redesigning America’s High Schools.” This document announces President Barak Obama’s High school Redesign Initiative, which is intended to “challenge high schools and their partners to rethink teaching and learning and put in place learning models that are rigorous, relevant, and better focused on real-world experiences.” The eight key elements of the USDOE redesign effort are reproduced in Figure ES1. Subsequent sections of the report will refer back to this table when discussing examples of innovative practices in order to highlight how each practice or design element relates to USDOE priority areas. See Figure 1.2 for an example summarizing the connection between a Partnership for 21st Century Skills curriculum map and USDOE priorities.

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### Figure ES1: US Department of Education High School Redesign Initiative Priorities

<table>
<thead>
<tr>
<th>Priority Area</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Redesign academic content and instructional practices</strong></td>
<td>To align with postsecondary education and careers and to foster deep understanding and mastery, with student-centered learning in a culture of high expectations.</td>
</tr>
<tr>
<td><strong>Personalize learning opportunities</strong></td>
<td>To support the educational needs and interests of individual students, optimize the pace of learning, and customize content and practices for students to master challenging academic content and pursue their interests.</td>
</tr>
<tr>
<td><strong>Provide academic and wrap-around support services</strong></td>
<td>For those students who need them, such as tutoring, mentoring, and comprehensive supports, so that all learners—including low-income students, English learners, and students with disabilities—can successfully graduate and transition smoothly into postsecondary learning and adulthood.</td>
</tr>
<tr>
<td><strong>Provide high-quality career and college exploration and counseling</strong></td>
<td>For students on postsecondary educational options, including education and training requirements for careers, college success skills, and financial aid options available for postsecondary education and training.</td>
</tr>
<tr>
<td><strong>Offer opportunities to earn postsecondary credit</strong></td>
<td>While still in high school through college-level coursework, such as dual enrollment, advanced placement courses, or other postsecondary learning opportunities.</td>
</tr>
<tr>
<td><strong>Provide career-related experiences or competencies</strong></td>
<td>Such as organized internships or mentorships; project- or problem-based learning; real-world challenges developed in consultation with employers or service organizations; and structured work-based learning opportunities.</td>
</tr>
<tr>
<td><strong>Strategically use learning time in more meaningful ways</strong></td>
<td>Which could include effective application of technology, redesigning school calendars, and competency-based progression.</td>
</tr>
<tr>
<td><strong>Provide evidence-based professional development</strong></td>
<td>To deepen educators' skills, support collaboration and expand a comprehensive system of student support.</td>
</tr>
</tbody>
</table>

Source: US Department of Education

This report takes these priority areas as a starting point for investigating promising initiatives designed to promote academic, social, and emotional growth among high school students. Its purpose is to provide a broad, high-level overview of key priority areas for school redesign by analyzing recent scholarship and policy literature on each of these topics and providing examples of what each strategy looks like in practice. The report is intended to offer a starting point for leaders and educators considering changes to their district high schools, but not an exhaustive study of the topics introduced. It is divided into two sections, each of which contains three major subsections:

- **Section I: Redesigning High School for Academic Success** highlights innovative high school redesign practices related to the integration of 21st century skills into the curriculum, an enhanced focus on college and career readiness, and “soft” skills development.

- **Section II: Redesigning High School for Social and Emotional Success** highlights emerging high school-level programming and support in the areas of 21st century extracurricular activities, social-emotional wellness, and learning environments.

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5 Ibid.
KEY FINDINGS

- High school redesign efforts can utilize a broad array of promising strategies in order to align academic, social, and emotional learning with 21st century standards. This report presents six prominent, high-impact strategies in discrete subsections for the sake of clarity, but the areas of overlap between them are substantial. For instance, schools that offer an impressive menu of well-run extracurricular activities and after school programs are likely to experience gains in attendance and engagement, as a corollary. Many extracurricular activities also improve students’ soft skills such as communication and cultivate desired attributes like perseverance and self-confidence.

- Every one of the strategies discussed in this report should be tailored to Rockwood School District’s unique needs and resources, and designed with specific outcomes in mind. Innovation simply for innovation’s sake can lead to school redesign efforts that are unsuited to the environment in which they have been implemented. With this in mind, all strategies ranging from the community partnerships advocated by the Partnership for 21st Century Skills (P21) to classroom and library redesign efforts should be based on a clear knowledge of student and community needs.

- P21, a major voice in the movement to align public education with the 21st century economy, publishes a Framework for 21st Century Learning (Framework) that seeks to infuse content-area instruction with the skills and interdisciplinary knowledge students need to thrive in the modern economy. The framework emphasizes critical thinking, communication, collaboration, creativity, information, media, and technology skills, and life and career skills training. They also advocate for interdisciplinary learning that emphasizes global and environmental awareness and cultural, financial, and civic literacy. P21 publications and lesson plans should be viewed as resources to provide ideas and help educators incorporate these elements into traditional academic subjects.

- Many educators and experts, including P21, call for enhanced college and career-oriented instruction in high school, and argue that it should be aligned with, and supported by, local businesses. While over 90 percent of students take some career and technical education (CTE) credits, less than 30 percent earn over five credits. Modern CTE programs are making progress in getting more students to take technical coursework, often for college or internship credit. For instance, the Ballston Spa Central School District in New York State has partnered with a local community college and area clean energy and technology firms to provide technical education. The program fulfills New York State high school graduation requirements and allows students to earn up to 25 college credits.

- Schools increasingly teach soft, or life, skills including interpersonal skills such as communication, leadership and problem solving, as well as personal qualities such as responsibility, self-discipline, independence, and self-confidence. According to the US Department of Education, colleges and universities, and the vast majority of employers, many students need these skills but are not learning them. Students from
low-income households are significantly more likely than their peers to have soft skills deficits, and extracurricular activities and classroom simulations of the workplace are especially effective at reducing this disparity.

- **Well-run extracurricular activities** such as after school programs and traditional activities like interest groups, performing arts, and athletics have been shown to improve students’ academic outcomes, engagement, wellbeing, and long-term sense of membership in their communities. At a time when recent Gallup polls suggest that half of high school-aged students are not engaged or actively disengaged from school, finding ways to reach them is a major priority. The design and objectives of extracurricular activities should account for student needs and community resources, but all such initiatives should ensure access and offer sustained, quality programming four or five days per week for two or three hours in order to maximize impacts. Many extracurricular activities and after-school programs also benefit from partnering with community organizations or local businesses.

- **Most students receive adequate social-emotional learning (SEL) opportunities through traditional instruction and extracurricular activities, but schools increasingly turn to technology to reach students who require additional support for challenges like bullying, substance abuse, and academic difficulties.** For instance, the Collaborative for Academic, Social, and Emotional Learning (CASEL) identifies college and career readiness learning communities, mindfulness practices, data-based early warning systems, and the use of smartphones and digital devices to “check-in” with students as innovative 21st century SEL practices.

- **As technology, enhanced college and career-oriented CTE, and community and business partnerships alter instructional content and practices, school leaders need to reevaluate how their students are interacting with their digital and physical environments and modify them to meet emerging needs and practices.** Recent initiatives by the Gates Foundation, among others, have focused on incorporating technology-enhanced innovation labs and flexible, interdisciplinary learning spaces into existing school facilities. Coupled with robust access to instructional technology and 1:1 computing programs, these types of school redesigns can enable students to learn, collaborate, and create at their own pace online. Successful redesign efforts often focus on turning school libraries into media centers and design-oriented maker spaces.
SECTION I: REDESIGNING HIGH SCHOOL FOR ACADEMIC SUCCESS

This section explores research on innovative high school models and their impacts on students’ academic achievement. In particular, this section will address the ways that education experts and practitioners have restructured the academic experiences of high school students to be more reflective of 21st century challenges. The section includes discussions of:

- 21st-Century Skills Framework
- College and Career Readiness
- Soft Skills

The leading school and curriculum design models and priorities discussed in this section often overlap with one another. A such, successful schools may implement them in part or in their entirety, and combine models or alter their emphases to suit their needs and goals. In short, bridging the gap between leading school redesign theories and academic instruction at specific schools can be complicated, and levels of implementation fidelity and overlap between models may vary considerably. With this complexity in mind, this section has three goals for its discussion of each model:

- Explain the instructional model or priority
- Discuss its origin and major stakeholders, and provide an overview of its perceived strengths and weaknesses
- Provide examples of the model’s successful implementation and highlight implementation best practices

Where relevant, this analysis will also seek to make connections between the models and goals in theory and practice.

21ST CENTURY SKILLS FRAMEWORK

As noted above, the overarching theme of each of these discrete subsections is the interdisciplinary nature of instruction in these areas. For instance, in many redesigned schools that adhere to the Partnership for 21st Century Skills’ (P21) Framework for 21st Century Learning, curricula often balance traditional core content areas with interdisciplinary subjects that are more tailored to modern-day needs. According to P21, key subjects include standard areas such as English, reading, mathematics, science, and history. Meanwhile, 21st century interdisciplinary themes that schools can incorporate into mainstream curricula include: global awareness; financial, economic, business, and entrepreneurial literacy; civic literacy;
health literacy; and environmental literacy.\textsuperscript{6} Finally, 21\textsuperscript{st} century skills include critical thinking and problem solving, communication and collaboration, information literacy, media literacy, information, communications and technology literacy, initiative and self-direction, social and cross-cultural skills, productivity and accountability, and leadership and responsibility.\textsuperscript{7} P21 asserts that a modern curriculum balances a number of key components: \textsuperscript{8}

- Teaches 21\textsuperscript{st} century skills discretely in the context of key subjects and 21\textsuperscript{st} century interdisciplinary themes
- Focuses on providing opportunities for applying 21\textsuperscript{st} century skills across content areas and for a competency-based approach to learning
- Enables innovative learning methods that integrate the use of supportive technologies, inquiry- and problem-based approaches, and higher order thinking skills
- Encourages the integration of community resources beyond school walls

Many of these elements feature prominently in other areas of innovative school design, further highlighting the importance of the interrelated and holistic approach to restructuring for 21\textsuperscript{st} century needs. In the end, a redesigned 21\textsuperscript{st} century curriculum should use critical themes that are pertinent to the student body to empower students and encourage them to think critically about real-world issues and apply what they learn in real-world contexts.\textsuperscript{9} This section will present the key considerations that school administrators should consider when redeveloping curricula, and will underscore in particular the benefits of student-centered learning in 21\textsuperscript{st} century classrooms.

**P21 IN CONTEXT: STRENGTHS, WEAKNESSES, AND APPLICABILITY**

The Partnership for 21\textsuperscript{st} Century Skills (P21) has been a major force in public education since its founding in 2002, and its model (explained below) and instructional priorities offer a broad vision of effective education.\textsuperscript{10} Its plan for redesigning public education encompasses myriad issues, including: assessment and accountability; leadership and culture; learning; teaching and professional development; and infrastructure.\textsuperscript{11} P21’s efforts are designed to assist school leaders’ integration of key redesign ideals and concepts into mainstream lessons. Their marketing asserts that “when a school or district builds on this foundation, combining

\begin{itemize}
  \item [8] Bullet points taken verbatim from: Ibid., p. 8.
\end{itemize}
the entire framework with the necessary support systems, […] students are more engaged in the learning process and graduate better prepared to thrive in today’s global economy.”12

The Framework for 21st Century Learning (Framework) is arguably the most influential of P21’s contributions to education reform. This 2006 graphic (and the accompanying analysis required to interpret it) encompasses the student outcomes required for high school graduates to succeed in the 21st century economy. These goals, or student outcomes, are shown in the colored arch at the top of the figure. According to P21, education should develop life and career skills (red), learning and innovation skills (yellow), and information, media, and technology skills (purple). All of these competencies are to be supported by and integrated with students’ underlying mastery of key subjects of academic achievement (green): English, reading or language arts, world languages, arts, mathematics, economics, science, geography, history, government and civics.13

The four “pools” below the goals are the support structures required to teach them effectively. They include standards and assessments, curriculum and instructional practices, professional development, and learning environments conducive to P21 skills and subject area instruction. In summarizing their Framework’s support needs, P21 calls for an “innovative support system to engage learners through applicable skills and knowledge, appropriate technologies, and real-world connections to make learning relevant, personalized, and engaging.”14

![Figure 1.1: P21 Framework for 21st Century Learning](image_url)

Source: Partnership for 21st Century Learning15

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14 Ibid.

P21 was founded primarily by large corporations, many of which are education publishing and technology firms including Pearson, Learning.com, Intel, and AT&T. It has, however, established partnerships with the National Education Association (NEA) and American Federation of Teachers (AFT) as well. Nevertheless, P21 has been criticized for its strong ties to education publishing and technology companies who would benefit financially from the Framework’s heavy emphasis on technology education. As one 2009 feature in Education Week notes, critics allege that P21 “is a veiled attempt by technology companies—which make up the bulk of the group’s membership—to gain more influence over the classroom.”

While some of P21’s detractors are skeptical of its intentions, other critics question how, and whether, the group and its Framework provide concrete, actionable guidance for effective school redesign. Longtime Washington Post education columnist Jay Mathews argues that a major P21 book, 21st Century Skills: Learning for Life in Our Times (Jossey-Bass, 2009), provides no comprehensive vision of what 21st century learning should look like in practice. He notes that the book, written by a pair P21 board members who are also technology executives, “has much material on West Virginia’s school innovation plans, which sound interesting, as new policies often do, but gives few clues to whether they have had any significant impact on classroom results.”

For some education experts, the term “21st century skills” has become little more than a buzzword that can mean whatever various stakeholder groups want it to mean. Mathews contends that no one, not even P21, has provided a clear definition of 21st century skills:

...the phrase ‘21st century skills’ has become so common in conferences and newsletters and journals and luncheon handouts and even presidential speeches, and so lacking in meaning, that I feel an obligation to look carefully at all serious attempts to define it.

A 2010 Education Week feature asked 11 education experts including award-winning teachers, professors of education, researchers, and policymakers to define 21st century skills, and subtitled the article “One question. Eleven answers.” Like the P21 framework, many responses emphasize the need for students to master subject matter content as in traditional educational models, but synthesize, apply, and interact with it in creative ways and using analytical skills and digital media and devices.

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20 Ibid.
Another point of contention regarding P21 is its emphasis on skills, sometimes at the perceived expense of instructional content. As Brandon Wilson notes in a recent discussion of the Framework, “much of the P21 Framework’s basis comes from a belief that children need proper opportunities and avenues to gain skills for careers.”\(^{22}\) Indeed, the framework’s emphasis on skills is embedded in the title, even if instructional content has a central place in the framework. New York University professor of education and Common Core advocate Diane Ravitch, argues that most of the skills advocated by P21 are not new to education and need to be complemented by more traditional academic and social skills.\(^{23}\) Moreover, she observes that the emphasis on 21\(^{st}\) century skills is part of a long-running debate about the relationship between skills-based and content-based instruction in public education. She cites the rise and fall of previous iterations of skills-based education such as the 1980’s “Outcome-Based Education” and the 1950’s “Life Adjustment Movement.”\(^{24}\)

Ultimately, P21 is most usefully viewed not as a prescribed curriculum, set of recommendations, or systematic education program, but as a set of goals that educators and local schools can embrace and plan to work toward. In responding to detractors who argued that the Framework provides limited actionable guidance to educators, former P21 President Ken Kay, sought to clarify the organization’s vision for how it would impact schools:

> In his view, P21 must serve as a catalyst for states and districts to think about how they can be more deliberate in fostering the skills. It is still up to local educators to put into practice the changes, he says. And none of its publications’ examples is meant to serve as a standard, which they have occasionally been interpreted to be.\(^{25}\)

While it remains committed to its general vision, P21 has become more focused on providing actionable resources for educators in order to connect the Framework with school design and classroom practices than it was when Mathews and others within the education community leveled their criticisms in 2009 and 2010.\(^{26}\) Two initiatives are particularly noteworthy:\(^{27}\)

- The **21st Century Learning Exemplar Program** showcases examples of successful 21st century learning, where it is happening across the country, and the patterns of innovation that can make it a reality for all students.\(^{28}\)

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Working with subject-area teachers, P21 connects 21st Century Skills with lesson ideas for different grade levels and subject areas in the 21st Century Skills Maps.\(^{29}\)

**P21 IMPLEMENTATION**

As noted above, the Partnership for 21st Century Skills provides detailed “curriculum maps” detailing connections between 21st century skills instruction and themes and academic subject instruction. P21 provides curriculum maps for Project Management for Learning, Mathematics, World Languages, Arts, Geography, Sciences, Social Studies, and English.\(^{30}\) This subsection provides examples detailing what 21st century skills instruction actually looks like in the classroom based upon P21’s curriculum maps. Figure 1.2 tracks the alignment of these proposed 21st century learning lessons and activities with the Department of Education’s High School Redesign Priorities.

**Figure 1.2: USDOE High School Redesign Elements in the P21 Mathematics Curriculum Map Examples**

<table>
<thead>
<tr>
<th>HIGH SCHOOL REDESIGN PRIORITY</th>
<th>PRESENT IN EXAMPLE?</th>
<th>RATIONALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Redesign academic content and instructional practices</td>
<td>✓</td>
<td>Activities “foster deep understanding and mastery, with student-centered learning.”</td>
</tr>
<tr>
<td>▪ Personalize learning opportunities</td>
<td>✓</td>
<td>Activities “support the educational needs and interests of individual students, optimize the pace of learning, and customize content and practices.”</td>
</tr>
<tr>
<td>▪ Provide academic and wrap-around support services</td>
<td>✗</td>
<td>N/A</td>
</tr>
<tr>
<td>▪ Provide high-quality career and college exploration and counseling</td>
<td>✗</td>
<td>N/A</td>
</tr>
<tr>
<td>▪ Offer opportunities to earn postsecondary credit</td>
<td>✗</td>
<td>N/A</td>
</tr>
<tr>
<td>▪ Provide career-related experiences or competencies</td>
<td>✓</td>
<td>Activities feature “project- or problem-based learning.”</td>
</tr>
<tr>
<td>▪ Strategically use learning time in more meaningful ways</td>
<td>✓</td>
<td>Activities feature “effective application of technology.”</td>
</tr>
<tr>
<td>▪ Provide evidence-based professional development</td>
<td>✗</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Source: Hanover Research analysis of US Department of Education High School Redesign Fact Sheet (see Figure ES1)\(^{31}\)

A selection of activities from the mathematics curriculum map is shown below in Figure 1.3 and Figure 1.4. The figures provide sample activities that integrate 21st century themes and

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\(^{30}\) See: Ibid.

mathematical content into eight of its ten associated 21st century “Learning and Innovation Skills” (e.g. creativity and innovation, media literacy). For the sake of brevity, activities relating to the Leadership and Responsibility and Initiative and Self-Direction skills are excluded. In both figures, the top (dark gray) row names the Learning and Innovation Skill, the second (white) cell describes the activity relating to that skills, and the third (light gray) row lists which (if any) of the five 21st Century Interdisciplinary Themes are featured in the lesson or activity.

Figure 1.3: Selected Mathematics Grade 12 Curriculum Map Activities

<table>
<thead>
<tr>
<th>CREATIVITY AND INNOVATION</th>
<th>CRITICAL THINKING AND PROBLEM SOLVING</th>
<th>COMMUNICATION AND COLLABORATION</th>
<th>INFORMATION LITERACY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students use a computer algebra system to factor completely the polynomial $x^n - 1$ for positive integer values of n. They conjecture a relationship between n and the number of factors and post their conjecture on a class website. Students review each other’s conjectures, and then each student revises or refines his or her own conjecture.</td>
<td>Students read about the mathematics of three-dimensional maps that a team of researchers has designed for measuring the environmental value of open space areas with no roads. Students then explore current policies pertaining to conserving roadless areas, such as the controversial “Roadless Rule” and determine how the mathematical maps could be used to improve policies for conserving open space. They craft a letter to their congressional representative or another policymaker explaining their analysis.</td>
<td>As a joint activity with a social studies class, students study the history of how seats have been allocated in the U.S. House of Representatives. They analyze the mathematics behind different plans and underlying sociopolitical issues, such as the effects on small versus large states or rural versus urban populations. Students then solve various “fair division” problems for their city council or state house of representatives using different plans. Finally, students hold a debate in which students advocate for different plans, considering both the mathematical and social issues that go into the allocation of seats.</td>
<td>Students work in groups to investigate the history of a topic within the class’s current field of study, using websites such as the MacTutor History of Mathematics. For example, if the class is studying algebra, each group explores the history of an algebra topic, such as quadratic equations, group theory, or set theory. Each group creates a wiki entry based on its findings.</td>
</tr>
</tbody>
</table>

Related Interdisciplinary Themes(s):
- None

Related Interdisciplinary Themes(s):
- Civic literacy
- Environmental literacy

Related Interdisciplinary Themes(s):
- Civic literacy

Related Interdisciplinary Themes(s):
- None

Source: Partnership for 21st Century Skills

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Students read articles about the so-called “Climategate” scandal of 2009, in which critics charged that some scientists had manipulated data to overstate global warming trends. They also read about more recent studies confirming or refuting earlier data on the impact of global warming. Based on an analysis of relevant data and charts, students break into groups to argue both sides of this issue to explain global warming and how it relates to climate change.

Related Interdisciplinary Themes(s):
- Global awareness
- Environmental literacy

Students use graphing calculators, computer algebra systems, or both, to assist in examining patterns in population growth or decline of a particular animal species using data from the U.S. Fish & Wildlife Service or another source. For example, students might study the changes in the population of Canada geese by building functions and examining graphs to answer problems regarding long-term trends. Students can share their findings with a school biology class by developing a lesson on the use of mathematics in examining biological developments.

Related Interdisciplinary Themes(s):
- Environmental literacy

Students review the algebraic formula for exponential growth and use the formula to solve a basic problem involving the spread of a viral disease: If 100 people are currently infected, and the number of people infected doubles every twelve hours, how many people will be infected after one week?

The class discusses the exponential spread of infections and identifies other relevant examples of exponential growth, such as: bacteria growth; human population growth; the growth of atmospheric carbon dioxide; and, in finance, the compounding of interest. Then students work in groups: each group poses a question involving exponential growth and gives it to another group to answer. Each group shares its results with the class.

Related Interdisciplinary Themes(s):
- Health literacy
- Environmental literacy

Students make a timeline covering the history of different currencies and work out conversions for current values using proportionality and linear functions. They study inflation in terms of exponential growth and use the Cost Performance Index to set up ratios and determine the real value of money. Students read news articles from around the world about currency trading and identify its effects on inflation in various countries.

Related Interdisciplinary Themes(s):
- Financial literacy
- Global awareness

Source: Partnership for 21st Century Skills

**COLLEGE AND CAREER READINESS**

Advocates for high school curriculum reform argue that current curricula often do not provide modern-day students with adequate preparation for today’s college and career demands. Indeed, according to the U.S. Department of Education, “many high school graduates lack exposure to learning that links their work in school to college and careers – especially in the
critically important fields of science, technology, engineering, and mathematics (STEM).”

Thus, high schools are increasingly tasked with developing programs that foster college- and career-readiness. In Missouri, this can include dual enrollment and early college high school or career pathways centered around Career Clusters (e.g., Agriculture, Food, and Natural Resources; Architecture and Construction; Business, Management, and Administration; etc.).

College and career readiness initiatives are often referred to as Career and Technical Education (CTE).

CTE can include the types of direct vocational preparation that qualifies students for high-demand jobs straight out of high school, but in recent years it is coming to be seen as a valuable opportunity for students to explore career fields prior to choosing a college major. Ultimately, the purpose of programs that promote college and career readiness is to better align high school learning with real-world applications. Career and Technical Education (CTE) is commonly implemented as a way to accomplish this, but many schools institute specific career-centered academies that highlight experiential and hands-on learning.

**College and Career Readiness in Context: Evolving Views of CTE**

As noted above, career readiness is a major emphasis of the skills-based P21 framework. The Partnership seeks to connect local businesses with educators in order to ensure that the education students receive aligns with regional economic needs. With this in mind, P21 asks business and community leaders to help define “the skills required for young people to be successful in work and life in the 21st century.” Businesses should also consider providing teachers with professional development opportunities and joining with educators to offer students “authentic, hands-on learning opportunities in their local communities.”

Some studies indicate that 90 percent of high school students earn at least some CTE credits before graduating. In many cases, CTE complements a more traditional high school education rather than supplanting it. Despite substantial interest nationwide in enhancing CTE options for college-bound students, the most recent National Center for Education Statistics data indicate that only 28.6 percent of students have earned five or more CTE credits. Thus, “most students have some interaction with CTE during their high school experience,” but the majority of these students are not immersing themselves in CTE. Part of the problem remains the widespread perception of CTE courses as intended for students with no

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36 “What is CTE?” Association for Career and Technical Education. https://www.acteonline.org/cte/#.V72_i_krK01


postsecondary education plans, and the century-old division of high school curricula into rigid vocational and college-prep tracks.\textsuperscript{39}

The American Institutes of Research contends that “the evolution of CTE is making it a more popular and viable option for students of all abilities.”\textsuperscript{40} In one North Carolina CTE program profiled in the \textit{Winston-Salem Journal}, for example, long-standing vocationally-oriented programs such as cosmetology continue to attract students and prepare them for state licensure. Nevertheless, the Winston-Salem/Forsyth County Schools CTE program now offers over 100 CTE programs for students at all levels of achievement and a range of career and educational aspirations. Students interested in avionics or aerospace engineering can take courses through its Career Center Aviation program. Other notable programs include a health science academy and information technology academy embedded within local high schools.\textsuperscript{41}

Examples like the college-prep, STEM-focused career academies at Winston-Salem/Forsyth County Schools emphasize the possibilities of locally-developed CTE across the curriculum, but these types of programs still appear to be more the exception than the rule. For instance, the U.S. Department of Education’s 2012 blueprint for CTE lists four core principals. Only the second, entitled “Collaboration,” deals with the relationship between CTE courses and college attendance, and it is equally as focused on connections between CTE and industry (see Figure 1.5). In short, current national plans to reform CTE do not focus extensively on providing technical education to students who plan to attend a four-year college or university.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{four_core_principles.png}
\caption{Four Core Principles of CTE}
\end{figure}

\textbf{Figure 1.5: Four Core Principles of CTE}

\begin{tabular}{|l|}
\hline
\textbf{U.S. Department of Education Core Principles for CTE} \\
\hline
\textbf{Alignment:} Effective alignment between high-quality CTE programs and labor market needs to equip students with 21st-century skills and prepare them for in-demand occupations in high-growth industry sectors; \\
\textbf{Collaboration:} Strong collaborations among secondary and postsecondary institutions, employers, and industry partners to improve the quality of CTE programs; \\
\textbf{Accountability:} Meaningful accountability for improving academic outcomes and building technical and employability skills in CTE programs for all students, based upon common definitions and clear metrics for performance; and \\
\textbf{Innovation:} Increased emphasis on innovation supported by systemic reform of state policies and practices to support CTE implementation of effective practices at the local level. \\
\hline
\end{tabular}

Source: U.S. Department of Education\textsuperscript{42}

\textsuperscript{39} Scholars attribute this division to the passage of the Smith-Hughes Act, also known as the National Vocational Act, of 1917. For an overview of the law, see: Steffes, Tracy L. “Smith-Hughes Act.” Encyclopaedia Britannica. https://www.britannica.com/topic/Smith-Hughes-Act


Although the Department of Education’s blueprint for CTE continues to focus on vocational training, many scholars are calling for enhanced integration of CTE curricula into the curricula for college-bound students. Shepherd Siegel, manager of Career + Technical education for the Seattle Public Schools, writes that “career + technical education is the original and logical place for contextual, project-based, and community-based learning.” He argues that enhanced CTE could help the United States produce more STEM at the college level.43

Enhanced cooperation between business and schools is one commonly cited strategy for enhancing the relevance and appeal of CTE among students of varying postsecondary plans. A 2011 Association for Career and Technical Education report concedes that “the stigma of CTE as the domain for students not going onto a four-year degree program still exists in the United States,” and calls upon CTE educators, students, and businesses to “collaborate and launch a local and national public awareness campaign.”44 In a 2011 report on education and economic success, the Harvard University Graduate School of Education advocates a comprehensive, systematic engagement between the business community and educational institutions from the middle school level through postsecondary education:

Our goal should be that beginning no later than middle school, all students should have access to this system of employer involvement and assistance. In middle school, this would include career counseling, job shadowing, and opportunities to work on projects or problems designed by industry partners. In high school, it would include programs of study designed in collaboration with industry leaders, as well as opportunities for more intensive work-based learning such as paid internships. At the post-secondary level, employers and their trade associations need to take a much more active role in collaborating with colleges to specify the knowledge and skills that people need to work in their industry. In addition, they should provide structured part-time employment linked to the student’s program of study. This would address one of the most damaging disconnects in our current education system.45

Academic research on CTE programs suggests that despite the growing interest in programs among policymakers and in public debate, CTE programs are not an automatic educational and economic panacea. Studies have shown that CTE participation continues to carry an opportunity cost for college-bound students because these courses may mean students take fewer courses in mathematics, science, and language arts. Moreover, research does not conclusively indicate that CTE participation has enhanced students’ college attendance and graduation rates, nor has it been shown to drastically improve their economic prospects.46 As the University of Alaska, Anchorage’s Dayna Jean DeFeo concludes in a recent article, CTE’s


“null to modest results are disheartening,” given the “investment of time and resources” devoted to it.47

**COLLEGE AND CAREER READINESS IMPLEMENTATION**

P21 has named New York State’s Ballston Spa Central School District (Ballston Spa) as one of its 21st Century Exemplar programs due to its innovative CTE offerings.48 Ballston Spa serves roughly 4,300 students in the Albany area, partnered with the Hudson Valley Community College (HVCC) TEC-SMART facility in Malta, NY to develop a Clean Technologies and Sustainable Industries Early College High School (Clean Technologies) program for local students. The program allows students to attend classes at HVCC and earn up to 25 college credits while still in high school.49 According to P21, the Clean Technologies program serves approximately 300 students in Grades 9-12, 20 percent of whom qualify for free or reduced lunches.50 Figure 1.6 highlights areas of overlap between the Clean Technologies program and the USDOE high school redesign project.

**Figure 1.6: USDOE High School Redesign Elements in the Clean Technologies Program**

<table>
<thead>
<tr>
<th>High School Redesign Priority</th>
<th>Present in Example?</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Redesign academic content and instructional practices</td>
<td>✓</td>
<td>The program “foster[s] deep understanding and mastery, with student-centered learning.”</td>
</tr>
<tr>
<td>Personalize learning opportunities</td>
<td>✓</td>
<td>The program “support[s] the educational needs and interests of individual students, optimize the pace of learning, and customize[s] content and practices for students to master challenging academic content and pursue their interests.”</td>
</tr>
<tr>
<td>Provide academic and wrap-around support services</td>
<td>❌</td>
<td>N/A</td>
</tr>
<tr>
<td>Provide high-quality career and college exploration and counseling</td>
<td>✓</td>
<td>The program offers “education and training requirements for careers [and] college success skills.”</td>
</tr>
<tr>
<td>Offer opportunities to earn postsecondary credit</td>
<td>✓</td>
<td>The program offers dual enrollment options.</td>
</tr>
<tr>
<td>Provide career-related experiences or competencies</td>
<td>✓</td>
<td>Activities feature “project- or problem-based learning” and “real-world challenges developed in consultation with employers or service organizations.”</td>
</tr>
<tr>
<td>Strategically use learning time in more meaningful ways</td>
<td>✓</td>
<td>The program features the “effective application of technology.”</td>
</tr>
</tbody>
</table>

---

Students in the Clean Technologies program can choose from one of four career pathways (outlined in Figure 1.7), all of which allow students and faculty to interact with local leaders in their industries:

Teachers work directly with industry partners as part of ongoing professional and curriculum development, incorporating what they learn about employer needs and expectations directly into student assignments. Three hour instructional blocks provide flexibility for designing transdisciplinary instruction and collaboration. Various post-graduate opportunities as well as a rigorous capstone project ensures students are ready for the real world.52

Any of the four concentrations allow students to simultaneously earn their high school diploma and complete their first two years of college. The program leverages the districts’ 1:1 computing resources to provide online learning options and grant students a high degree of autonomy about where and when they complete their work. Students can enroll in the program as early as Grade 9, though the majority of program coursework for Grades 9 and 10 is offered at the student’s high school. In Grade 11, students choose their program pathway (see Figure 1.7). During these years, they take a mix of high school and college courses at the TEC-SMART facility in the morning and return to the high school in the afternoon.53

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52 Ibid.
### Figure 1.7: Ballston Spa Central School District Clean Technologies Program Pathways: Courses and Career Options

<table>
<thead>
<tr>
<th><strong>Clean Energy</strong></th>
<th><strong>Computer Science and Information Systems</strong></th>
<th><strong>Mechatronics</strong></th>
<th><strong>Leadership, Innovation, and Entrepreneurship</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Courses include:</strong></td>
<td><strong>Courses include:</strong></td>
<td><strong>Courses include:</strong></td>
<td><strong>Courses include:</strong></td>
</tr>
<tr>
<td>▪ College Forum</td>
<td>▪ College Forum</td>
<td>▪ College Forum</td>
<td>▪ College Forum</td>
</tr>
<tr>
<td>▪ Introduction to Computing and Information Science</td>
<td>▪ Introduction to Computing and Information Science</td>
<td>▪ Introduction to Computing and Information Science</td>
<td>▪ Introduction to Computing and Information Science</td>
</tr>
<tr>
<td>▪ Psychology</td>
<td>▪ Psychology</td>
<td>▪ Psychology</td>
<td>▪ Psychology</td>
</tr>
<tr>
<td>▪ Introduction to Wind Energy</td>
<td>▪ Introduction to Business Analytics and MS Excel</td>
<td>▪ Introduction to Business Analytics and MS Excel</td>
<td>▪ Entrepreneurship Process</td>
</tr>
<tr>
<td>▪ Photovoltaic Theory and Design</td>
<td>▪ Programming and Logic II-Data Structures</td>
<td>▪ Business Communications</td>
<td>▪ Principles of Marketing</td>
</tr>
<tr>
<td>▪ Photovoltaic Installation and Performance</td>
<td>▪ Introduction to Database Concepts with MS Access</td>
<td>▪ IT Essentials (A+): PC Hardware and Software</td>
<td>▪ Statistics</td>
</tr>
<tr>
<td>▪ Legal and Ethical Environment of Business I</td>
<td>▪ Introduction to Robotics</td>
<td>▪ Sociology</td>
<td>▪ Organization and Management</td>
</tr>
<tr>
<td>▪ Sociology</td>
<td>▪ College Math</td>
<td>▪ College Math</td>
<td>▪ College Math</td>
</tr>
<tr>
<td>▪ College Math</td>
<td>▪ College English</td>
<td>▪ College English</td>
<td>▪ College English</td>
</tr>
</tbody>
</table>

**Potential careers include:**

- Energy auditor
- Wind energy engineer
- Photovoltaic installers
- Bioenergy researchers
- Chief Sustainability Officers
- Construction managers
- Architects

**Potential careers include:**

- Advanced Manufacturing Electronics/semiconductor industry
- Materials science, including textiles, polymers, packaging, among others
- Auto and aerospace industries
- Biotechnology
- Medical fields and pharmaceuticals
- Food science, including quality control and packaging

**Potential careers include:**

- Small Business Owner
- Sales Managers
- Marketing Managers
- Computer Systems Managers
- Construction Managers
- Public Relations Specialists
- Patent Lawyers
- Inventors

Source: Ballston Spa Community School District

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SOFT SKILLS

Despite the long-time emphasis on ‘hard’ skills associated with core academic subjects—such as writing and the STEM disciplines—recent research suggests that ‘soft’ skills are increasingly sought by colleges and employers. Broadly, these skills include “the ability to adapt to changing circumstances and the willingness to learn through experience, and are applicable across multiple disciplines and careers.” While much of the focus of college- and career-readiness programs (namely CTE) is on the acquisition of hard skills that will be immediately useful in the postsecondary or labor market sector, education experts are advocating for the inclusion of soft skills in these curricula.

A 2012 article in Education Week lists time management, interpersonal skills, communication skills, and resiliency as examples of these skills. The author cites research indicating that “many teenagers lack” soft skills and may experience lower college-completion rates as a result. A US Department of Education (USDOE) initiative categorizes soft skills as those which foster “effective relationships,” and recognizes two categories of skills:

- **Interpersonal skills** include teamwork, customer service skills, leadership, negotiation, problem solving, and respect for differences.
- **Personal qualities** are skills and cultivated attributes such as responsibility and self-discipline, independence, willingness to learn, integrity, professionalism, initiative, a positive attitude, sense of self-worth, and an interest in professional growth.

According to the Department of Education, these relational skills must be paired with “workplace skills” such as communication, information use, and systematic thinking, as well as “applied knowledge,” which requires critical thinking and the ability to use academic skills in new contexts. The USDOE’s Employability Skills Framework is reproduced in Figure 1.8.

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59 See: Ibid.
SOFT SKILLS IN CONTEXT: UNEVENLY TAUGHT AND ESSENTIAL TO SUCCESS

Experts continue to differ on precisely how soft skills should be defined. However, it is widely agreed that a strong mix of hard and soft skills education ensures that students enter college or the workforce physically and educationally prepared to handle their rigors and that they possess the skills needed to apply that learning appropriately. The Association for Middle Level Educators believes that “preparation for college and career success requires much more than exposure to a robust curriculum” and argues that “workforce leaders describe a skills gap [...] in competencies rather than content.”61 Many of the soft skills that colleges and employers value are already inherent components of the 21st century learning framework (Figure 1.9); thus, innovative schools may already be incorporating elements of contemporary soft skills into their core curricula.

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60 Ibid.
Recent research suggests that the general public tends to value communication and teamwork as key soft skills, alongside “hard” skills such as math and reading. Recent research by the Pew Research Center asked a national sample of adults to select from a list of ten skills those which are most essential for children’s future success. Respondents could select multiple options. The proportion of respondents designating each skill as “essential” is shown in Figure 1.10.

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Scholars generally agree that soft skills are necessary if students are to learn effectively during their education, and should not be viewed solely as an educational end to be desired by employers. However, there is not yet widespread agreement about how schools should foster these skills, and to what degree they should be held accountable for doing so. As a March 2016 report from the Brookings Institution observes, “the reality is that research on soft skills is soft,” and that there is little evidence of “what works in schools that are trying to improve student competences in this domain, or who should be held accountable for what and how.”

These obstacles aside, teaching soft skills in schools is likely to be increasingly important as the proportion of students from low-income homes continues to rise. A 2015 study by the Southern Education Foundation indicates that “51 percent of the students across the nation’s public schools were low-income in 2013.” The average in Missouri was somewhat lower at 45 percent of students. Poverty rates among public school students in St. Louis and Jefferson

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Counties are lower still, at 38 and 39 percent, though even these figures indicate that nearly two in five students in RSD’s service area come from low-income homes.\(^{67}\)

The Brookings Institution’s analysis of the 2010 Children of the National Longitudinal Youth Survey indicates that there are “gaps in exposure to classroom activities relating to building...important ‘soft’ skills, particularly for low-income students.”\(^{68}\) In many cases, low-income students make the largest gains in soft skills when they participate in extracurricular activities that foster self-discipline, teamwork, leadership, and social engagement. The problem is that students from the bottom two family income quintiles are less likely than students from higher-income families to be asked to work in groups in the classroom, give presentations, and complete writing assignments on a regular basis. Thus, schools may need to ensure that these students receive ample opportunities to develop soft skills in the classroom and via extracurricular activities.\(^{69}\)

A soft skills deficit can also hinder an otherwise well-prepared student’s college prospects. Academically qualified students from low-income families who lack a college-educated parent and have limited guidance from their high schools may struggle with the college application and financial aid process, or simply fail to realize why the pursuit of additional education is necessary due to a lack of “social capital”.\(^{70}\)

Applying to college is a complex and difficult process, even for the most academically qualified students. In school systems such as CPS in which the majority of students do not have college-educated parents, improving students’ qualifications will not necessarily lead to increases in college enrollment if there is not also support for students as they navigate the application process. Research on college access and choice highlights the importance of the norms for college, access to college information, and concrete guidance and support, resources that first-generation college students often lack. These are often termed social capital explanations.\(^{71}\)

**SOFT SKILLS IMPLEMENTATION**

There are a variety of different approaches to teaching soft skills, and the implementation examples provided below were selected for their overlap with CTE education. The American Institutes for Research and US Department of Labor (USDOL) Office of Disability Employment Policy published a guide to teaching soft skills in 2010. This document traces the interest in soft skills among workplaces and educators to the early 1990s, and contends that “the need to coach new hires about soft skills is an accepted fact among employers and those who

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\(^{69}\) Ibid.


\(^{71}\) Ibid. p. 11.
prepare individuals for the workforce.” Figure 1.11 summarizes the areas of overlap between the USDOE high school redesign program described below and the USDOL’s soft skills development recommendations.

**Figure 1.11: USDOE High School Redesign Elements in USDOL Soft Skills Simulations**

<table>
<thead>
<tr>
<th><strong>HIGH SCHOOL REDESIGN PRIORITY</strong></th>
<th><strong>PRESENT IN EXAMPLE?</strong></th>
<th><strong>RATIONALE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Redesign academic content and instructional practices</td>
<td>✓</td>
<td>The strategy “align[s] with postsecondary education and careers.”</td>
</tr>
<tr>
<td>Personalize learning opportunities</td>
<td>✓</td>
<td>The strategy “support[s] the educational needs and interests of individual students.”</td>
</tr>
<tr>
<td>Provide academic and wrap-around support services</td>
<td>✗</td>
<td>N/A</td>
</tr>
<tr>
<td>Provide high-quality career and college exploration and counseling</td>
<td>✓</td>
<td>The strategy offers “education and training requirements for careers [and] college success skills.”</td>
</tr>
<tr>
<td>Offer opportunities to earn postsecondary credit</td>
<td>✗</td>
<td>N/A</td>
</tr>
<tr>
<td>Provide career-related experiences or competencies</td>
<td>✓</td>
<td>The strategy features “project- or problem-based learning” and “real-world challenges developed in consultation with employers or service organizations.”</td>
</tr>
<tr>
<td>Strategically use learning time in more meaningful ways</td>
<td>✓</td>
<td>The strategy features “competency-based progression” through simulated compensation.</td>
</tr>
<tr>
<td>Provide evidence-based professional development</td>
<td>✓</td>
<td>The strategy requires collaboration between educators and employers that may “deepen educators’ skills” and “support collaboration.”</td>
</tr>
</tbody>
</table>

Source: Hanover Research Analysis of US Department of Education High School Redesign Fact Sheet (see Figure ES1)

The USDOL guidelines are particularly useful because they focus on “teaching soft skills through workplace simulations in classroom settings.” This approach aligns well with the type of interdisciplinary, CTE skills-based approaches to education advocated by P21. The USDOL classifies three major strategies for teaching soft skills:

- **Interactive teaching** requires instructors to develop exercises that “provide opportunities for experience, practice, reinforcement, and reflection” across a variety of increasingly challenging soft-skills development scenarios. The authors note that this approach is resource and time-intensive and requires skilled teachers and a strong curriculum, and that even the best interactive teaching programs may “lack the authenticity of the real workplace.”

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Workplace coaching for students engaged in on-the-job training, work experiences, internships, and work study programs can help to develop skills in real-world contexts. The potential disadvantages of this approach include the difficulty of finding local businesses to host and mentor students, and the potential lack of involvement by the student’s teachers.

Simulated classroom workplace environments “alter aspects of the classroom setting where general education or hard skills are being taught to workforce entrants so that the classroom simulates the workplace.” This strategy, which is the USDOL’s recommended approach, is likely to provide a more authentic experience than interactive teaching while maintaining teacher control over the process. Moreover, because it only requires a recalibration of existing classroom environments and resources, this approach “can be universally applied to have maximum impact on soft-skill deficits among our youth without new legislation, additional money, or new players.”

The USDOL argues that “the best way to achieve workplace authenticity is to model the classroom simulation after a real business and replicate its workplace rules and cultural nuances.” Its guide recommends that teachers partner with an actual community business if possible in order to provide a realistic business model and set of employee expectations, which the teacher will adopt to the classroom simulation. Furthermore, the partner business should align with students’ career interests to the extent possible, and include technical or academic skills in relevant areas of focus. Teachers may need to undertake substantial preparation in order to act as convincing managers or supervisors and enable students to develop relationships and hone their communication, teamwork, and relationship skills.

A successful workplace simulation environment must also emphasize:

- **Time management in the context of business-like purposefulness**, which will provide students with the opportunity to allocate time and resources to tasks associated with the simulation.
- **Tangible incentives for “work” performance**, which offer students authentic “compensation” for their simulated work, and incentivize productivity. USDOL recommends developing a token-based compensation system, which can then be converted to actual wages to illustrate what the students’ actual earnings would be.

Other recommended lesson plans and simulations for soft skills practice can be found in more limited lesson plans published by P21. For instance, the one of the Grade 12 “Collaboration” activities in the sciences involves participation in a “citizen science” service learning project. In this project, students “collaborate with their peers and experts during

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75 Ibid. p. 3.
76 Ibid. p. 4.
77 List summarizes content from: Ibid. pp. 7-9.
scientific discourse and appropriately defend arguments using scientific reasoning, logic, and modeling.” P21 describes the activity, which it also argues fosters civic literacy, as follows:

Students participate in a ‘citizen science’ project such as a service learning project, or an environmental issue specific to the community; through which they have the opportunity to work collaboratively with local and remote research scientists, organizations, agencies, and/or universities. Student teams blog about their experiences and how they connect to their classroom learning, then present their research findings to an external audience, such as a science fair, junior academy of science, or local chapter of a scientific professional society.

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79 Ibid. p. 6.
SECTION II: REDESIGNING HIGH SCHOOL FOR SOCIAL AND EMOTIONAL SUCCESS

This section examines the nonacademic factors and considerations that contribute to an innovative and modern high school experience. It highlights ways that high schools can contribute to student success outside of the classroom. Specifically, it includes high-level discussions of:

- Extracurricular Activities
- Social-Emotional Wellness
- Learning Environments

The most recent results from an annual Gallup Student Poll indicate that students in today’s schools are not thriving in their current environments. Indeed, half of students in Grades 5 through 12 report feeling either “not engaged” or “actively disengaged” in school, and slightly more than half of these students are not hopeful of their future prospects (Figure 2.1). Moreover, data suggest that as students enter high school and progress toward graduation, their engagement, hope, and entrepreneurial aspiration decreases. For example, out of a 5-point scale, students in Grade 5 rate their engagement at 4.30 while their counterparts in Grade 12 rate it at 3.62.\(^80\) This trend implies that high school students may require more dedicated resources to ensure that their learning environment is engaging, collaborative, and meaningful. Data also show that students perform better when they feel like they matter and belong within the school community.\(^81\)

**Figure 2.1: Engagement and Hopefulness among Students Grades 5-12, 2015**

Source: Gallup\(^82\)


P21’s framework highlights the importance of collaboration for 21st-century students, not only as a tool to bolster student engagement and achievement, but also as an essential skill that will help them to succeed beyond high school. As such, this section will examine how schools can leverage an inclusive, supportive environment in order to boost student performance through tools that promote engagement, collaboration, and hard and soft skills acquisition in formal and informal ways.

As in Section I’s analysis of academic elements of high school redesigns, the topics highlighted in the subsections below are interrelated. For instance, students’ abilities to develop social-emotional wellness are likely to be impacted by their school environment and the types of extracurricular activities available. Moreover, some of the strategies highlighted here—such as innovative extracurricular activities and classroom spaces—complement academically-focused redesign priorities like soft skills development, CTE, and project-based learning. The goal of the subsections below is threefold:

- Explain the initiative, student support priority, or school design feature
- Summarize the research and evidence relating to the school redesign effort’s design, impacts, and relationship with other efforts
- Provide examples of the model’s successful implementation and highlight implementation best practices

**EXTRACURRICULAR ACTIVITIES**

Research overwhelmingly shows that participation in extracurricular activities—e.g., after-school clubs, band, or athletic teams—in high school can lead to improved student performance and higher scores on the SAT exam. In many cases, extracurricular activities have been found to have the largest effects on disadvantaged students, helping to reduce the achievement gap and offering low-achieving students a way to engage with school. These types of claims are widely cited. As far back as the mid 1990s, the National Center for Education Statistics has argued that extracurricular activities “offer opportunities for students to learn the values of teamwork, individual and group responsibility, physical strength and endurance, competition, diversity, and a sense of culture and community.” Figure 2.2 outlines some of the benefits of student participation in extracurricular activities.

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**Figure 2.2: Summary of the Benefits of Extracurricular Activities**

- **Activities teach universal lessons.** Students learn the value of practice, how to apply themselves to a task, and the satisfaction that comes from achievement. Students involved in multiple activities learn how to manage and plan their time, a key skill for success.

- **Activities build confidence.** Students struggling in the classroom may begin to doubt their own abilities and skills. Success in an outside activity can create a sense of confidence that translates into more confident classroom performance. Also, it helps struggling students earn esteem among their peers.

- **Activities build relationships.** Sports, theater, music, and other achievement-focused activities increase opportunities for strong adult relations, mentoring, and positive peer associations.

- **Activities keep students in a safe, monitored place.** Effectively extending the school day, activities help keep kids out of trouble and help to reduce working parents’ anxiety about their children.

- **Activities build character.** Participation helps students develop discipline, commitment, tenacity, control, and a healthy respect for authority.

Source: Education Partnerships, Inc.

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**EXTRACURRICULAR ACTIVITIES IN CONTEXT: WIDESPREAD IMPACTS AND LIMITED ACCESS**

Building upon the benefits highlighted in Figure 2.2, dozens of academic research studies compiled by the National Federation of State High School Associations show widespread personal and social benefits for robust extracurricular programs and widespread student involvement. According to this body of research, specific types of extracurricular activities are associated with the following social-emotional and academic benefits:

- **Improved educational outcomes:** Studies link participation with higher grades, standardized test achievement, and postsecondary educational aspirations.

- **Enhanced school engagement and sense of belonging:** Participation correlates with relationship development, motivation, and engagement, especially among urban, minority, and ethnically diverse students.

- **Positive youth development/life skills:** Research has repeatedly linked athletic participation with life, or “soft,” skills development, and self-esteem development.

- **Healthier behaviors:** Students who participate in extracurricular activities are less likely to engage in risky behaviors such as drug and alcohol abuse, violence, and unprotected sex, have better mental health than nonparticipants, and are more likely to maintain health and fitness behaviors into adulthood.

- **Post-high school positive results:** Evidence suggests that participation in athletics has positive educational and behavioral results that persist after high school, and that participation in activities in general correlates with postsecondary educational attainment, voting, and volunteerism. Again, these gains appear to be magnified

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among low-income and at-risk student populations and persist anywhere from 2-20 years after graduation.

- **Citizenship development:** Eighteen to 25 year olds who participated in sports during high school are more likely to vote and volunteer within their communities. These results are particularly pronounced among Black students.

- **School and community benefits:** Schools with diverse and well-developed extracurricular activities have higher attendance rates and graduation rates than schools without them and lower rates of violent crime.

Given the importance of extracurricular offerings for student performance and wellbeing, national organizations and education experts cite the need to align these activities with a 21st century framework. For example, P21 urges local school leaders to “provide extracurricular/after-school activities that support service learning, community involvement, digital literacy, and global awareness,” all critical elements of innovative and modern school redesign.\(^8\) Similarly, researchers found that extracurricular activities steeped in 21st century skills and enrichment, such as arts-based opportunities, can better prepare students for a modern and globalized world.\(^9\) Research conducted by the University of Cambridge suggests that co-curricular activities and elective courses in fields like debate, journalism and school publications, art, and music align particularly well with 21st century skills instruction.\(^9\)

**EXTRACURRICULAR ACTIVITY IMPLEMENTATION**

The array of extracurricular activities offered by public school districts in the United States varies widely based upon local culture, district resources, parent involvement, student interest, and community support. Different types of programs are likely to have very different benefits. These could range from improved relationships among students, mentoring opportunities for teachers and coaches, and improved physical health among student athletes to enhanced academic performance and student-teacher relationships among students participating in after-school activities. A white paper by Harvard University's Harvard Family Research Project states that:

Given the broad range of program goals, it follows that activities offered in after school programs vary widely. They include academic enrichment, tutoring, mentoring, homework help, arts (music, theater, and drama), technology, science,
reading, math, civic engagement and involvement, and activities to support and promote healthy social/emotional development.  

The Harvard Family Research Project’s analysis of a decade of research on extracurricular activities identifies three “critical factors” in program implementation that can help ensure extracurricular activities of all varieties improve students’ learning and developmental outcomes:

- **Ensuring access and offering sustained programming** is essential to any successful extracurricular program. Research consistently suggests that programs that meet more frequently and over a sustained period of time lead to better outcomes for student participants. Planners should seek to tailor programs to student interests, needs, and schedules while also seeking to expose participants to new challenges, ideas, and people.

- **Quality programming** is defined by its emphasis on “ensuring adequate physical and psychological safety and effective management practices.” In the case of after-school programs, leaders must also provide for adequate supervision and structure, retain highly-qualified staff members to run the program, and work to provide students with a broad menu of activities to meet their interests and needs.

- **Strong partnerships** with families, schools, and communities are becoming increasingly essential to success, particularly for resource-intensive after school programs. Many school-initiated after school initiatives rely on a partner organization such as a faith-based organization or local library to help offer programming or even provide the physical facility for the program.

The Harvard Family Research Project states that school programs typically “run for 2-3 hours per day, 4-5 days per week,” and occur in a wide variety of settings including “including schools, museums, libraries, parks districts, faith-based organizations, youth service agencies, county health agencies, and community-based organizations.”

Research strongly suggests that after school programs can improve students’ academic outcomes, attitudes, behavior, attendance rates, self-confidence, and communication skills, and that they may also empower students to make healthier choices regarding diet, drug and alcohol use, and high-risk behaviors.

Figure 2.3 provides an overview of potential areas of overlap between academics and enrichment-focused after school extracurricular programs and the USDOE’s high school

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94 See: Ibid. pp. 2-5.
redesign priorities. It is important to note, however, that results will likely vary based upon individual school and district programming and priorities.

**Figure 2.3: USDOE High School Redesign Elements in Harvard Family Research Project**

*After School Programming*

<table>
<thead>
<tr>
<th>High School Redesign Priority</th>
<th>Present in Example?</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Redesign academic content and instructional practices</td>
<td>✔️</td>
<td>After school programs can “align with postsecondary education and careers” and “foster deep understanding and mastery, with student-centered learning in a culture of high expectations.”</td>
</tr>
<tr>
<td>Personalize learning opportunities</td>
<td>✔️</td>
<td>After school programs can “support the educational needs and interests of individual students, optimize the pace of learning, and customize content and practices for students to master challenging academic content and pursue their interests.”</td>
</tr>
<tr>
<td>Provide academic and wrap-around support services</td>
<td>✔️</td>
<td>After school programs can feature “tutoring, mentoring, and comprehensive supports.”</td>
</tr>
<tr>
<td>Provide high-quality career and college exploration and counseling</td>
<td>✗</td>
<td>N/A</td>
</tr>
<tr>
<td>Offer opportunities to earn postsecondary credit</td>
<td>✗</td>
<td>N/A</td>
</tr>
<tr>
<td>Provide career-related experiences or competencies</td>
<td>✗</td>
<td>N/A</td>
</tr>
<tr>
<td>Strategically use learning time in more meaningful ways</td>
<td>✗</td>
<td>N/A</td>
</tr>
<tr>
<td>Provide evidence-based professional development</td>
<td>✗</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Source: Hanover Research Analysis of US Department of Education High School Redesign Fact Sheet (see Figure ES1)

### SOCIAL-EMOTIONAL WELLNESS

Modern classrooms help students learn social and emotional skills and develop “the ability to navigate the complex life and work environments in the globally competitive information age.”

Traditionally, the Social and Emotional Learning (SEL) framework discussed in this section helps reduce student risk factors and facilitate positive adjustments to school.

Curricula that incorporate SEL foster five key, interrelated competencies for modern students: self-awareness, self-management, social awareness, relationship skills, and responsible decision making. Many of these skills are cornerstones to 21st century learning.

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already, and are also related to soft-skills development as discussed in Section I. However, this subsection focuses on social-emotional wellness programs intended to provide additional and targeted support and instruction for struggling students.

**SOCIAL-EMOTIONAL WELLNESS IN CONTEXT: CHANGING PRACTICES AND GROWTH AREAS**

In high schools, SEL programming can address two learning strategies that contribute to increased school performance and cognitive development. 98

- The first involves instruction in processing, integrating, and selectively applying social and emotional skills in developmentally, contextually, and culturally appropriate ways. Through systematic instruction, SEL skills may be taught, modeled, practiced, and applied to diverse situations.
- In addition, many programs help students apply SEL skills in preventing specific problem behaviors such as substance abuse, interpersonal violence, bullying, and school failure.

Most research on SEL focuses on primary and middle-school programs, rather than secondary-level programs. As a result, a 2014 *Education Week* feature notes that “we know far less about secondary schools that make social-emotional learning central to their mission, linking it inextricably to academic development.” 99 That said, recent research has begun to emphasize the relationship between hard and soft skills in SEL. It indicates that the “complex interplay between the two” means that they should be viewed as integrated, rather than discreet types of learning. Another major recent conclusion relating to secondary-level SEL is that zero-tolerance discipline policies should be replaced with restorative practices that aim to educate and integrate struggling students rather than punish or isolate them. 100

The Collaborative for Academic, Social, and Emotional Learning (CASEL) describes possible future directions for SEL at the middle and high school levels. CASEL’s analysis of current trends and research identifies college and career readiness learning communities, mindfulness practices, early warning systems, and the use of smartphones and other devices to assess and check-in with students as future directions for the field. 101 Some modern schools are using mobile or online applications to help students develop these critical social-emotional skills. Similar to the increase in digital education around core subject areas, the development of digital social and emotional games has allowed many 21st century schools to leverage technology beyond traditional classroom learning. 102

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98 Bullet points adapted from: Ibid., p.3.
100 Ibid.
SOCIAL-EMOTIONAL WELLNESS IMPLEMENTATION

As with extracurricular activities, the range of SEL needs, and the types of programs available to meet those needs, varies significantly. School districts will most likely have to develop their SEL programming to meet specific community needs and align with available resources. As emphasized in Figure 2.4, the majority of the program’s offerings fall within two USDOE priority areas relating to providing personalized learning opportunities and academic and wrap-around support services.

Figure 2.4: USDOE High School Redesign Elements in SEL Programming

<table>
<thead>
<tr>
<th>HIGH SCHOOL REDESIGN PRIORITY</th>
<th>PRESENT IN EXAMPLE?</th>
<th>RATIONALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Redesign academic content and instructional practices</td>
<td>✗</td>
<td>N/A</td>
</tr>
<tr>
<td>▪ Personalize learning opportunities</td>
<td>✓</td>
<td>SEL programs can “support the educational needs and interests of individual students, optimize the pace of learning, and customize content and practices for students.”</td>
</tr>
<tr>
<td>▪ Provide academic and wrap-around support services</td>
<td>✓</td>
<td>SEL programs can feature “tutoring, mentoring, and comprehensive supports so that all learners—including low-income students, English learners, and students with disabilities—can successfully graduate and transition smoothly into postsecondary learning and adulthood.”</td>
</tr>
<tr>
<td>▪ Provide high-quality career and college exploration and counseling</td>
<td>✗</td>
<td>N/A</td>
</tr>
<tr>
<td>▪ Offer opportunities to earn postsecondary credit</td>
<td>✗</td>
<td>N/A</td>
</tr>
<tr>
<td>▪ Provide career-related experiences or competencies</td>
<td>✗</td>
<td>N/A</td>
</tr>
<tr>
<td>▪ Strategically use learning time in more meaningful ways</td>
<td>✗</td>
<td>N/A</td>
</tr>
<tr>
<td>▪ Provide evidence-based professional development</td>
<td>✓</td>
<td>SEL programs should provide educators with “evidence-based professional development to deepen educators’ skills, support collaboration and expand a comprehensive system of student support.”</td>
</tr>
</tbody>
</table>

Source: Hanover Research Analysis of US Department of Education High School Redesign Fact Sheet (see Figure ES1)

Recent reports on fostering SEL through technology focus on two key areas. These are products that incorporate SEL into academic instruction more effectively and “newer technologies, such as wearable devices and virtual reality systems, which the groups believe

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warrant additional investment.” Prominent high-school level examples from both categories include the following emerging education technology products and services:

- **RippleEffects**: A ‘whole-spectrum learning’ system that includes multimedia content and assessment tools. The purpose is to introduce students to real-life scenarios related to difficult social and emotional situations, then provide training and support to help them learn how to navigate such situations in their own lives.

- **Scholar**: A web-based ‘social learning platform’ that is meant to promote student writing by providing lots of opportunities for peer-to-peer interaction and collaboration, a constant stream of informal feedback, and multimedia-creation tools to encourage student engagement and creativity.

- **Social Express**: A series of online, animated, interactive lessons in which students can practice navigating real-life social interactions, with the goal of developing such skills as conflict resolution and group participation.

While technology can be a powerful tool for enhancing SEL at the secondary level, experts still recommend a holistic approach to instruction. A 2015 report published by the Stanford Center for Opportunity in Public Education offers seven recommendations to educators and policy makers seeking to improve SEL instruction. They range from comprehensive advice to teach SEL along with academic content, rather than seeing the two as standalone fields, to establishing school discipline practices whose primary aim is to support students. These recommendations are reproduced in their entirety in Figure 2.5.

**Figure 2.5: Stanford University High School SEL Recommendations**

<table>
<thead>
<tr>
<th>PRACTICE AREA</th>
<th>RECOMMENDATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Curriculum design</strong></td>
<td><strong>Erase the cognitive/non-cognitive divide in education.</strong> Successfully educating all students requires both academic and psychological resources—academic, social, and emotional factors are essentially interwoven, mutually interdependent, and should not be considered in isolation from one another. They are critical to all students’ opportunity to learn, but also matter in particular ways for students of color and for students in low-income contexts.</td>
</tr>
<tr>
<td><strong>Student development</strong></td>
<td><strong>Leverage a ‘whole-child’ perspective on student development.</strong> Failing to overcome the cognitive/non-cognitive divide in education practice and policy will lead to innovations and strategies that are, ultimately, suboptimal. Education more broadly, and social and emotional learning in particular, also needs to align with students’ key developmental pathways that evolve through their elementary, middle school, and high school years.</td>
</tr>
</tbody>
</table>

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105 List quoted verbatim from: Ibid.

106 For more information, see: “Home.” RippleEffects. http://rippleeffects.com/

107 For more information, see: “About Scholar.” Scholar. http://info.cgscholar.com/about-scholar

<table>
<thead>
<tr>
<th>PRACTICE AREA</th>
<th>RECOMMENDATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curriculum integration across schools</td>
<td>▪ Engage systemic, whole-school change. Integrating social emotional learning into schools and curricula will fail to be maximally effective if done by inserting isolated programs into factory-model high schools that continue to underserve and disadvantage many students. Social emotional learning will be most effective when practiced and implemented comprehensively and coherently across key levels of the school—climate and culture, features and structures, and formal and informal practices—as well as when its practice is supported by districts.</td>
</tr>
<tr>
<td>Explicit instruction</td>
<td>▪ Teach social emotional skills explicitly and ensure that they are reflected and reinforced by school practices. While a whole-school approach to social emotional learning is necessary, schools should also set aside a time and place to focus explicitly on social and emotional skill building. Schools can do this by locating a place in the curriculum, possibly in advisory class, where students and teachers can develop and practice key skills and competencies.</td>
</tr>
<tr>
<td>Assessment</td>
<td>▪ Include a social emotional perspective in curricular and assessment policies. Students are motivated, engaged, and responsible when their education is connected to who they are and what they care about. Curricula should be relevant, real world, and socially oriented. Assessment practices should reinforce the development of social emotional skills, enable students to apply what they learn in relevant ways, and reflect the ways in which learning is collaborative and interactional.</td>
</tr>
<tr>
<td>Discipline policy</td>
<td>▪ Establish approaches to discipline through practices that preserve relationships, respect dignity, and provide psychological support. Common approaches to student discipline isolate students from their peers and teachers, expel students from the school community, offer little opportunity for students to learn from and make amends for their actions, and fail to provide psychological and emotional support. Moreover, students of color and students in poverty are disproportionately affected by harsh or zero-tolerance policies, fueling the school-to-prison pipeline, which do nothing to address the chronic stressors that often result in behavioral issues for these students.</td>
</tr>
<tr>
<td>Professional development</td>
<td>▪ Enable educators to become psychological, as well as academic, experts. Preservice teacher training programs, as well as teacher and administrator certification requirements and continuing education opportunities, need to provide educators with the skills they need to cultivate classrooms and schools that support students’ psychological, social, and emotional needs along with their academic needs. To serve students well, this requires increased expertise in social emotional learning and child development.</td>
</tr>
</tbody>
</table>

Source: Stanford Center for Opportunity Policy in Education

**LEARNING ENVIRONMENTS**

Increasingly, educators acknowledge the role that physical factors can play in student success. This newfound awareness of the learning environment is evident as the public education sector increasingly transitions to 21st century paradigms and embraces the “Design Thinking”

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movement. Innovative schools are redesigning their physical learning environments to facilitate modern technologies and student-centered learning. For example, some experts posit that “in 21st century schools, students become makers and learners, teachers become facilitators and activators, and classrooms become learning studios and learning commons [...] Existing classrooms inhibit ‘makers’ from ‘making’ and learners from collaborating.” Recently, two design models have predominately begun transforming learning spaces in redesigned schools:

- **One or more innovation labs or special learning spaces across the campus** – e.g., simulation labs, spaces for interdisciplinary learning
- **The transformed 21st century school** – e.g., double-sized subject matter learning environments, large multi-group collaboration zones, project planning rooms, and open-access digital media libraries

Innovative learning spaces provide the benefit of allowing schools to take advantage of pioneering technologies in high school education. For example, in one redesigned school in San Francisco, teachers blend technology with in-person instruction, and technology labs allow students to enroll in online courses for subjects not offered at the school. This subsection explores various ways that schools have modernized and updated physical learning spaces to complement new learning pedagogies, and how these new spaces can contribute to 21st century learning.

**LEARNING ENVIRONMENTS IN CONTEXT: COLLABORATION, FLEXIBILITY, AND SUSTAINABILITY**

As with each of the other interventions profiled in this report, efforts to redesign schools’ physical facilities are closely related to educators’ efforts to prioritize 21st century skills, improve students’ social and emotional wellbeing, and align instruction with the demands of the modern economy. For instance, P21’s vision of the 21st century learning environment is focused on supporting collaborative and individual learning styles, maximizing access to technology and resources, facilitating project-based and career-focused learning, building relationships among students and teachers, and ensuring equity. With these ends in mind, it emphasizes the development of learning environments that include face-to-face and online components.

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111 Ibid.

112 Bullet points adapted from: Ibid.


P21’s ideal 21st century classroom design features flexible, comfortable seating and workspaces and an emphasis on technology and internet connectivity (see inset text box for an example). Social connectivity is also emphasized, and the Partnership even recommends that schools consider efforts to make their facilities a locus of the community at large by incorporating other services such as childcare and even senior centers into their design as a means of fostering “intergenerational gatherings.” They note that “such collaborative arrangements can offset costs for all stakeholders while creating year-round multi-generational learning places that enrich relationships among community members.”

P21 21st Century Classroom Design

Recent years have witnessed renewed interest among educators, policymakers, and communities in redesigning the physical environments of their schools to align with 21st century instructional priorities. However, redesign priorities should be decided in response to specific instructional goals, and never undertaken for their own sake. For instance, the Gates Foundation-funded Next Generation Learning Challenges program, which began in 2010 and concentrates on schools in Washington, DC, and Chicago, prioritizes blended learning programs. Participating schools have upgraded their technology infrastructure to enhance students’ access to instructional technologies that can help teachers to customize instruction and daily learning goals. While the results of the program appear to have been mixed thus far, the program has resulted in changes to classroom design and operation as well as pedagogy.

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115 Ibid. p. 9.
116 Ibid. pp. 10-12.
117 For instance, see major school-redesign grant programs funded by the Gates foundation and Laurene Powell Jobs, widow of former Apple CEO Steve Jobs:
Successful redesign programs often solicit input from community stakeholders and students. For instance, district leaders at Boston Public Schools “began its redesign process by conducting public meetings and inviting dozens of organizations, colleges, and other institutions to host their own conversations.” Respondents highlighted the need for efforts to “use the city as a classroom” and focus on project-based and student-led learning. Similarly, a pilot program called The Independent Project, founded by students at the public Monument Mountain Regional High School in Massachusetts, has allowed students to create “their own learning environment in order to find the engagement and mastery he felt were lacking in many teacher-designed classes.” The eight students who participated in the pilot phase developed a program of instruction in which they completed self-directed interdisciplinary work in the arts and sciences and then taught their findings to their peers.

**LEARNING ENVIRONMENT IMPLEMENTATION**

As with the other high school redesign strategies profiled in this report, enhancements to the physical learning environment are heavily determined by local needs and resources. With this in mind, the example presented below provides an overview of an ambitious library revitalization project undertaken at the Henry M. Gunn High School (Gunn) in Palo Alto, California. This example is notable because the library at Gunn won the 2013 Follett Challenge grand prize for its redesign and revitalization efforts. The Follett Challenge seeks to recognize “unique, collaborative program[s]” in public education that “teach skills needed in the 21st century.” Three years after the transformation began, the library saw a 400 percent increase in daily student visits. The revitalized library, now christened the Gunn “Idea Lab,” is a vital student space designed to maximize collaboration and technology use.

While the results of any redesign effort are likely to vary based upon its scope and objectives, the Gunn Library project provides an example of how such initiatives can align with USDOE high school redesign efforts (Figure 2.6).

**Figure 2.6: USDOE High School Redesign Elements in the Gunn Library Redesign**

<table>
<thead>
<tr>
<th>High School Redesign Priority</th>
<th>Present in Example?</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Redesign academic content and instructional practices</td>
<td>✓</td>
<td>Library programming and facilities “align with postsecondary education and careers” and help to “foster deep understanding and mastery, with student-centered learning in a culture of high expectations.”</td>
</tr>
</tbody>
</table>

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122 Ibid. pp 1-2, 4.
In seeking to improve the library at Gunn, teacher-librarian Meg Omainsky sought ideas from the students it was meant to serve. Her stated goal was to “set aside any preconceived ideas about what we should have” and then solicit opinions from students through online surveys, focus groups, and a parent advisory group. The most important source of information was the student advisory group, which was tasked with finding out what their peers wanted the library to offer and reporting back to Omainsky each month with their findings. However, Omainsky also watched how students were using the library as she contemplated her revitalization efforts. For instance, she initially observed that students were attempting to use the library’s print nonfiction section as a seating area to collaborate and do research using phones and laptops. In response, Omainsky moved the print nonfiction section to a series of retractable shelves in the back of the library, and the space it used to occupy became the “creation-centered Idea Lab.”

The Idea Lab is explicitly modeled on the Hasso Plattner Institute of Design, or d.Institute, at the nearby Stanford University School of Design. Gunn library imitates the d. Institute’s use of interactive, flexible physical spaces as well as its interdisciplinary, frenetic ethos of creativity called Design Thinking:

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125 Ibid. p. 2.
126 Ibid. p. 2.
Design thinking is best learned by doing, and our classes immerse students in an experiential learning environment. Students cycle rapidly through a series of steps: observe, brainstorm, synthesize, prototype, and implement; repeating as necessary. We focus on the design process because we seek to equip our students with a methodology for producing reliably innovative results in any field. Our focus is on creating innovators rather than any particular innovation.127

As the library space continued to change Omainsky focused on adding flexible furnishings and floor-to-ceiling and portable white boards. Additional innovations include converting a disused conference room into a green screen video production space and improving access to crucial technology. For instance, when Omainsky noticed how often students were working on their digital devices she bar-coded the library’s existing laptops and changed the library policy to enable students to take them anywhere in the building. She also devoted funding to augmenting the school’s digital hardware.128 Finally, the most recent library innovation is the conversion of a staff workroom into a “quiet room” for studying and the expansion of library hours to 6:00 pm Monday through Thursday and 5:00 pm on Friday “to better serve students needing a place to study later into the evening.”129

The redesigned Gunn library also hosts the TEDx Gunn High School event. TEDx is a version of the popular TED (Technology, Entertainment, Design) talk which takes place entirely at the local level. The program name is licensed through TED, and the TEDx host organization must apply for a free license via the group’s website and demonstrate familiarity with its rules for organizing an event.130 The TEDx event at Gunn is organized as a one-day event featuring invited speakers from the Palo Alto community. Students manage every aspect of the event including identifying and soliciting speakers, stage production, applying for grants to fund the event, and communications and marketing. Guest speakers have included local professors, CEOs, computer scientists and designers, and entrepreneurs.131 A panel convened by American Libraries Magazine featured Omainsky as one of its speakers and offered the following advice for schools interested in organizing a TEDx event:132

- Obtain a TEDx license
- If possible, hire a professional video documentary crew to film the event
- Select an experienced Master of Ceremonies to run the event
- Obtain permissions and logos from sponsors and acknowledge them in the event and the resulting video (if one exists)
- Use social media to promote the event

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