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Running a Simulated Business in High School

The Implementation and Costs of the Virtual Enterprises Program in Six High Schools

In this report, we examine the implementation and costs of a work-based learning (WBL) program called Virtual Enterprises (VE) to inform the decisionmaking of schools and districts that are considering various approaches to WBL.[1] The VE program provides an immersive project-based learning experience through a high school course. Students in the VE course establish and run a simulated business, demonstrate their business knowledge and skills in regional and national competitions, and participate in a digital, international marketplace run by the program's developer, Virtual Enterprises International (VEI). VEI supports the program by providing a curriculum and resources on a learning management system, along with ongoing training and support for VE teachers.

Millions of high school students enroll in career and technical education (CTE) courses annually (Advance CTE, undated). WBL is a common element of CTE programs; it is a continuum of student experiences, from brief career awareness and exposure activities, such as a workplace tour, to immersive experiences, such as internships (Association for Career and Technical Education, 2022; Shields et al., 2024). These experiences may support general career readiness, including employability and professional skill-building, and personal development (Bailey, Hughes, and Moore, 2004; Ross, Brunner, and Rosen, 2020).

There is growing evidence that participation in CTE pathways, programs of study, or coursework is associated with positive postgraduation outcomes, and many districts and schools want to ensure that WBL opportunities are embedded in CTE (Lindsay et al., 2024; Shields et al., 2024). States are also increasingly focused on expanding WBL opportunities and tracking student participation in WBL as indicators of CTE quality (Goldring and Urban, 2024). However, the evidence is limited on how high

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KEY FINDINGS

- The six high schools in the study fully implemented four of the five components of the Virtual Enterprises (VE) program.
- Schools implementing VE had autonomy in some areas of program delivery, and study schools varied as to whether the VE course required prior business coursework, the number of periods a day the course met, and student selection processes.
- Staff and leadership identified funding, training, support from the program developer, and the selection of motivated students as valuable elements that support VE implementation.
- Staff and leadership reported extra demands on student and teacher time as the main barriers to implementation.
- School staff and students perceived the VE program as building career awareness, technical skills, and general career readiness.
- Per-student costs of the VE program varied across schools, from a low of $1,862 to a high of $6,024. Two schools flew students from California to New York City for a national competition (an optional cost), which added approximately $2,300 to $2,400 in per-student costs.

schools implement WBL, which types of WBL can positively affect student outcomes, and which WBL approaches can be adopted broadly across schools (Michaelson et al., 2026; Shields et al., 2024).

Employer-hosted WBL experiences can require substantial effort and investment that pose barriers to participation. Districts and schools must build relationships with local employers and comply with any relevant laws. Student transportation to work sites is often challenging (Bromley et al., 2022; Ross, Brunner, and Rosen, 2020). Other barriers described by researchers include application processes for a limited number of slots and students' lack of professional attire (Chen et al., 2019). Internships in health care settings might require health clearances, such as vaccinations (Chen et al., 2019). These obstacles may be stronger for low-income and rural youth (Gray, Lewis, and Ralph, 2018).

A different approach is to provide WBL on a high school campus, where classrooms are transformed into work or work-like environments (Moyer et al., 2017). There are two ways to do this. One is the *school-based enterprise*, in which students run an actual business, selling products or services to others; these are often developed as part of CTE pathways, such as culinary programs that establish on-campus restaurants. The other is to create a *simulated business*, such as in VE, in which no real money is exchanged but students are immersed in the culture and expectations of a workplace and learn employability and other types of skills (Moyer et al., 2017). While these models may be easier to implement, they might offer fewer mentoring or networking opportunities than employer-hosted WBL experiences. And although some research exists on school-based enterprises (Alfeld et al., 2013; Stern et al., 1994), there has been little research on simulated business environments.

Prior work has described the VE program and identified it as a promising model in need of additional evidence (Hughes, Miller, and Reese, 2021; Hughes and Golann, 2007; VEI, 2016). Our analysis of the implementation and costs of the VE program examined five research questions:

1. How did the six schools deliver the program, and which students were served?
2. Did the schools implement the program as intended?
3. What were the facilitators and barriers to implementation?
4. What did students and staff perceive as the differences in VE from the typical course, and how did they perceive its benefits for students?
5. What are the costs of the VE program to districts and schools?

To answer our research questions, we collected data from teacher surveys and interviews, leadership and

counselor interviews, student surveys and interviews, classroom observations, and a cost tool. A full description of the research methods and our analytic approach is available in the appendix.

We found that the schools implemented the program as intended, although schools had considerable flexibility in how they implemented the program. We also found few significant barriers to implementing the program and that teachers and students were enthusiastic about it. Our findings suggest that program costs varied across schools, and travel costs and compensation were the primary costs of delivering the program.

We recruited our study schools from two districts that were among the first to adopt the VE program: Kern High School District (KHSD) in Bakersfield, California, and New York City Public Schools (NYCPS). KHSD is a high school–only district located in a mid-size city that enrolls approximately 43,000 students per year. NYCPS is a kindergarten through grade 12 school district that enrolls approximately 300,000 high school students each year. NYCPS hosts the national VE competition. The districts had ten and 33 schools participating in VE, respectively. These districts might provide different levels of support for the program relative to districts with fewer VE schools.

Four KHSD schools and two NYCPS schools agreed to participate in the study. Because these schools volunteered for the study, they are not likely to be representative of all schools offering the VE program.

Although we acknowledge our limited sample, our evidence on the implementation and costs of the VE program offers useful insights into one approach that high schools can take to provide WBL. We aim to supply evidence to many district and school leaders who are looking to expand WBL opportunities and contribute to the research literature on promising models for WBL. We start by providing a more detailed description of the VE program and the core features of the program. We then describe findings for each of our five research questions. We conclude the report with a discussion of the lessons learned and recommendations for implementing WBL through such programs as VE.

ABBREVIATIONS

CTE	career and technical education
ELL	English language learner
KHSD	Kern High School District
NYCPS	New York City Public Schools
VE	Virtual Enterprises
VEI	Virtual Enterprises International
WBL	work-based learning

The Virtual Enterprises Program Model

Established in 1996, VE was the first simulated business program in the United States and has since been adopted by hundreds of schools. It introduces students to careers in business and provides students with an immersive, project-based learning experience that is delivered via a high school class. Each VE class establishes a simulated business in an industry of its choice (e.g., technology, advertising, insurance, fashion) and assigns students to key business roles according to their interests (e.g., chief financial officer, marketing director). VE students exchange goods and services in a simulated market with thousands of other student-run businesses in the United States and other countries and receive salaries and pay bills through a simulated bank. Students also participate in leadership-development events and regional and national trade shows and competitions, which are offered in person and online.

VEI, the program developer, provides the project-based and task-based curriculum, which is accessible through an online platform called the Hub. VE program materials emphasize that the course should be student-driven, with the teacher as a consultant and facilitator—a *guide on the side*. VEI also provides a variety of opportunities for in-person and online training, along with on-demand support and troubleshooting. VEI organizes and hosts the many events and competitions.

We reviewed program materials, engaged with the VE Hub, and talked with program leadership to identify the core features of the VE program and develop measures of implementation. Figures 1 and 2 describe

FIGURE 1

Core Components of the Virtual Enterprises Program

VE Core Component	What It Looks Like in Practice	Why It Is Important for Students
Student-Driven Learning 	In VE classrooms, teachers play a facilitator role rather than deliver whole-group instruction to the class. Students who lead various departments are responsible for overseeing their teams and completing tasks with limited teacher support. Student-driven learning is also commonly referred to as active learning.	Research from U.S. college classrooms shows that active learning increases students' academic performance in science, technology, engineering, and math. A meta-analysis of 225 studies showed that active learning led to higher exam scores and lower failure rates for all students (Freeman et al., 2014). A meta-analysis of 41 studies showed that high-intensity active learning reduces achievement gaps in undergraduate courses as well (Theobald et al., 2020). Student-driven approaches in VE classrooms also likely increase student voice and agency, which are associated with better academic performance and increased attendance (Conner et al., 2025).
A Business Environment 	The classroom environment is meant to mimic a place of business: Tables and chairs are grouped by department, and there are computers and other technical equipment, such as large screens for presentations, that are typically found in office conference rooms. A business environment also extends to expectations around workforce practices and culture. For example, students may "clock in" when they arrive in the classroom, and the chief executive officer and department leads set expectations for and monitor the classroom to ensure professional behavior.	There is scarce research on the value of a simulated business environment. A qualitative study of nine programs in five states found that simulated professional environments helped build student confidence and decisionmaking skills by exposing them to processes and situations they were likely to encounter on the job (Moyer et al., 2017). Qualitative, international research on business simulations in higher education finds that students gain a variety of skills, including strategic decisionmaking, communication, and teamwork (Eskerod and Min, 2025; Wang, 2023). Much of the research on simulated environments is related to postsecondary medical education, and a meta-analysis indicates positive influence on students' technical skills and problem-solving abilities (Chernikova et al., 2020; Ali, 2025). A review of business simulation games found that they improved participants' content-related knowledge and skills, communication, engagement, and motivation (Faisal et al., 2022).
Extended Learning Opportunities 	VEI sponsors events that students can participate in, such as regional, national, and global trade shows; competitions (e.g., business plan, financial literacy, elevator speech); and leadership development workshops, both in person and online, during which they interact with industry professionals and students from other VE firms. The Youth Business Summit is a multiday event held in New York City every spring that serves as a desired goal for programs.	Research shows WBL experiences that take place outside the classroom are beneficial for students. Participation in job shadowing, community service, mentoring, and internships is associated with higher early-career income for students (Plasman and Thompson, 2023). A recent meta-analysis of 21 studies of WBL in the United States found that internships had significant impacts on participants (Michaelson et al., 2026). Participation in career and technical student organizations, which involve out-of-class-time commitments and often include student competitions similar to VE, is positively associated with academic motivation, academic engagement, student grades, career self-efficacy, college aspirations, and development of employability skills. Of the core elements of career and technical student organizations (commonly referred to as CTSOs), participation in competitions had the most positive effects (Alfeld et al., 2006).

Figure 1—Continued

VE Core Component	What It Looks Like in Practice	Why It Is Important for Students
Teacher Training and Support 	VEI hosts an annual three-day, in-person training conference and online orientation sessions for teachers who are new to the program. Shorter training opportunities are offered in some regions to provide a variety of options to meet teacher needs. As teachers continue with implementing the program throughout the school year, five regional directors provide on-demand support via email, videoconference, or site visits. Teachers can pose questions or ask for help through the Teachers' Lounge section of the Hub.	Providing high-quality professional development for teachers is shown to lead to positive changes in teaching practice and improvements in student learning (Darling-Hammond, Hyler, and Gardner, 2017; Desimone and Garet, 2015; Yoon et al., 2007). Teacher responses to professional development experiences can vary, so providing a variety of options linked directly to their classroom content and practices is beneficial (Desimone and Garet, 2015). The most effective professional development also incorporates active teacher learning that is highly contextualized to the teacher, supports collaboration among teachers, provides coaching and expert support, and is of a sustained duration (Darling-Hammond, Hyler, and Gardner, 2017).
Project-Based Curriculum and VE Ecosystem 	The VEI curriculum is a project to plan for and operate a simulated business. The curriculum includes foundational tasks for all students in the class and department-based tasks that are designed for various groups (e.g., marketing, sales, human resources, accounting). Students also participate in a marketplace of all VE firms in the VE ecosystem. Using VEI's simulated online banking system, students track revenue and pay expenses for their firms and manage their own personal (virtual) salaries and financial responsibilities.	Studies of project-based learning compared with traditional curricula show higher academic achievement for middle school students in science (Harris et al., 2015) and for high school students in social studies, as well as a higher likelihood of achieving college and career readiness standards (Summers and Dickinson, 2012). The use of project-based learning in math education has been shown to lessen achievement gaps for low-income and minority students and lead to increased student motivation, critical thinking skills, and appreciation for peer learning (Holmes and Hwang, 2016). International meta-analyses and literature reviews show that there are broad benefits of project-based learning (Suyono, Tukiran, and Yuliaturosida, 2025; Zhang and Ma, 2023).

the five core program features and summarize evidence for these features as promising ways to support improved student outcomes. Our analysis of implementation examined whether the six study schools implemented these core features with fidelity.

The VE course is typically open to 11th and 12th grade students, but the mix of students varies, and some schools allow 10th graders to enroll. Some schools require students to complete applications and participate in interviews to enter the VE program, while others have less intensive selection policies. Some schools embed the VE course in a business pathway or require prerequisite coursework in business, while others deliver VE as an elective. And schools can choose whether to offer the VE course for one class period per day or two class periods. We provide an example of what a VE classroom and business might look like in Box 1.

The Six Schools Delivered the Virtual Enterprises Program in Varying Ways and Served Different Student Populations

The six study schools varied by type of school and size and the number of years that the schools had hosted a VE program (see Table 1). Schools also have considerable autonomy in how they deliver the program. For example, the schools varied in terms of how many sections were offered, whether the program is embedded in a CTE pathway, and how many class periods a day are allocated to the course (also shown in Table 1). Across the six schools, there were seven VE teachers overseeing eight VE programs.

The program materials that VEI developed recommend that students complete prior business coursework to ensure that they have the foundational knowl-

BOX 1

An Example of a Virtual Enterprises Classroom and Simulated Business

Business and product: Clear Investing, which sells financial products, such as individual retirement accounts.

Classroom's business setup: Two adjoining rooms: One holds multiple small conference tables, office chairs, and personal computers, while the other has one large conference table, a printer and copy machine, and a large screen on the wall.

Student workers: Nineteen seniors were working across the two rooms, and, because it was "Dress for Success Day," they were wearing business attire. Some were seated in groups and others worked on their own; all looked busy and focused on their tasks.

Classroom business activities:

- Marketing department students created PowerPoint slides and a QR code to share information about VE at the school's forthcoming fair that promotes all course options and used Canva software to make Instagram posts for their firm.
- An accounting department student independently used QuickBooks to track sales.
- The human resources department students were collaborating on designs for announcements for the department of the month and the employee of the month.
- A group of five students practiced a presentation for the upcoming regional business plan competition. In the timed presentation, each student took a turn speaking about a different aspect of their firm and business plan. The teacher simulated the question-and-answer portion of the competition, posing questions that the judges typically ask about the firm's structure, competition, and finances. Students then gave feedback to their teammates and discussed changes to be made.

NOTE: This example was drawn from data collection at several different schools to preserve confidentiality.

TABLE 1

Characteristics of Virtual Enterprises Implementation Across the Six Study Schools

School	Type of School	Total Students	Years Offering VE	Integration into Course Offerings	Number of Capstone VE Sections	Length and Duration
KHSD-A	Comprehensive	~3,000	12	VE Pathway: Intro to VE is a prerequisite	1	1 period per day; full year
KHSD-B	Comprehensive	~2,300	9	VE Pathway: Intro to VE is a prerequisite	1	1 period per day; full year
KHSD-C	Comprehensive	~2,150	4	School is trying to build a business pathway, no current prerequisite	1	1 period per day; full year
KHSD-D	Comprehensive	~2,700	15	Intro to business is recommended but not required	1	1 period per day; full year
NYCPS-A	Comprehensive	~4,600	13	3-year business sequence with VE as capstone	3	2 periods per day; full year
NYCPS-B	Business Magnet	~600	29	Accounting course is a prerequisite	1	2 periods per day; full year

SOURCE: Interviews with teachers and leadership, as well as data from teacher surveys.
NOTE: The "Number of Capstone VE Sections" column reflects the top-level VE course only. KHSD schools A and B offered an introductory-level VE course as well.

edge and skills to succeed in VE, but not all schools required such a course sequence. In one school, VE served as a capstone course for a full three-year business pathway. In two schools, students took "Introductory VE" as juniors and "Advanced VE" as seniors. In two other schools, there was a required or recommended prerequisite course (e.g., accounting, business). One school promoted VE as a capstone for the criminal justice pathway and is working on building a business pathway. In KHSD, the VE course satisfied the economics graduation requirement. In addition, VE programs varied in intensity: VE courses in KHSD met daily for one period and NYCPS VE courses met daily for a double period.

Besides focusing on higher-grade-level students and ensuring some prior business coursework, VE training and materials do not provide additional guidance on student application or selection. However, our prior research suggests that VE enrollment is a selective process in many schools (Berglund et al., 2026). Some schools enroll students in VE using counselor and teacher recommendations, an interview with the VE teacher, or student grades (Berglund et al., 2026). Of the six schools we examined, five of them used selective enrollment processes. These screening and selection processes might contribute to differences between VE students and other students not participating in VE.

More than 80 percent of VE students in the VE capstone courses in each district were seniors. The characteristics of seniors who participated in VE differed from the overall student population (Tables 2 and 3). We identified three key takeaways from the evidence on VE student characteristics:

- VE students had demographic and background characteristics that are traditionally associated with higher academic achievement. Students participating in VE across the two districts were less likely to be Hispanic and less likely to be English language learners (ELLs). VE students in NYCPS were less likely to be classified as low income, and VE students in KHSD had higher incoming math and reading scores.
- VE students were more likely to have taken advanced coursework and business coursework. Across both districts, VE students were more likely to have enrolled in other advanced coursework (e.g., Advanced Placement, honors). In NYCPS, VE students were more likely to have enrolled in a business course.

TABLE 2

Characteristics of Seniors in KHSD and Study Schools, by Virtual Enterprises Participation

Characteristic	All KHSD Schools with VE		KHSD-A		KHSD-B		KHSD-C		KHSD-D	
	Not in VE (*n* = 18,783)	In VE (*n* = 350)	Not in VE (*n* = 1,202)	In VE (*n* = 25)	Not in VE (*n* = 1,021)	In VE (*n* = 40)	Not in VE (*n* = 900)	In VE (*n* = 40)	Not in VE (*n* = 1,191)	In VE (*n* = 34)
Black	5%	3%	9%	0%	5%	8%	**7%***	**0%**	0%	0%
White	16%	14%	**12%*****	**48%**	**23%*****	**5%**	3%	8%	2%	0%
Hispanic	**72%*****	**65%**	**74%*****	**48%**	**45%*****	**15%**	87%	88%	98%	100%
Male	**50%***	**45%**	46%	48%	**52%*****	**30%**	**52%***	**38%**	48%	41%
ELL	**9%*****	**0%**	**10%***	**0%**	2%	0%	**10%****	**0%**	**17%****	**3%**
Prior honors participation	**58%*****	**812%**	**64%*****	**96%**	**66%*****	**100%**	**43%*****	**83%**	**66%*****	**88%**
Reading test score	**0.02*****	**0.70**	**−0.17*****	**1.01**	**0.50*****	**1.31**	**0.14*****	**0.89**	**−0.19*****	**0.28**
Math test score	**0.02*****	**0.77**	**−0.07*****	**1.38**	**0.65*****	**1.82**	**−0.01*****	**0.84**	**−0.06***	**0.22**
Number of unexcused absences	0.84	0.79	0.45	0.60	1.19*	0.55	0.90	0.65	0.62	0.71

SOURCE: Deidentified administrative data from 12th-grade students enrolled in KHSD high schools with VE programs in the 2023–2024 and 2024–2025 school years.
NOTE: Statistically significant differences between 12th-grade VE students and other seniors are indicated with a * for a *p*-value of <0.05, ** for a *p*-value of <0.01, and *** for a *p*-value of <0.001.

TABLE 3

Characteristics of Seniors in NYCPS and Study Schools, by Virtual Enterprises Participation

Characteristic	All NYCPS Schools with VE		NYCPS-A		NYCPS-B	
	Not in VE (*n* = 690,373)	In VE (*n* = 7,528)	Not in VE (*n* = 917)	In VE (*n* = 98)	Not in VE (*n* = 153)	In VE (*n* = 15)
Black	**24%*****	**18%**	4%	3%	15%	27%
White	**14%*****	**18%**	15%	14%	9%	20%
Hispanic	**41%***	**38%**	29%	17%	**49%***	**27%**
Asian	**18%*****	**25%**	59%	65%	24%	27%
Male	52%	54%	**50%*****	**68%**	56.9%	27%
ELL	**10%*****	**4%**	9%*	5%	2%*	0%
Special education	**18%*****	**12%**	**13%***	**19%**	**11%*****	**0%**
Low income	**75%****	**71%**	69%	70%	78%	73%
Prior honors or AP	**48%*****	**60%**	46%	67%	63%	66%
Prior business courses	**9%*****	**84%**	91%	100%	**6%*****	**67%**
Number of prior absences	**19.9*****	**14.5**	**26.6*****	**14.8**	**11.8****	**8.9**

SOURCE: Deidentified administrative data from 12th-grade students enrolled in NYCPS high schools with VE programs in the 2022–2023 school year.

NOTE: AP = Advanced Placement. Statistically significant differences between 12th-grade VE students and other seniors are indicated with bold font and * for a *p*-value of <0.05, ** for a *p*-value of <0.01, and *** for a *p*-value of <0.001.

- Some schools had VE student populations that looked more similar to their overall student population. Students in VE at NYCPS-A, KHSD-C, and KHSD-D had similar racial and ethnic backgrounds to the overall student population. The differences in test scores and honors course–taking were most prominent at KHSD-A and KHSD-B (schools with more-selective programs).

Collectively, these statistics indicate that districtwide, VE students are different from typical students, and the characteristics of VE students are typically associated with better academic outcomes (e.g., college enrollment). But VE populations varied across schools, and some schools had VE students who more closely resembled the overall student population.

Schools in the Study Implemented the Virtual Enterprises Program as Intended

We examined whether the six high schools implemented each of the five core components of the VE program as planned (i.e., with fidelity). Overall, we found that the VE programs across the six study schools implemented four of the five components with full fidelity. We found some variation in the implementation of one component—the curriculum—as shown in Table 4. We provide more detailed findings by component.

All Teachers Received Training, Although Training Sources Varied

Prior research suggests that structured training opportunities can be important to supporting the successful implementation of educational interventions (Carroll et al., 2007). VE provides a wide array of training events and resources for teachers and provides considerable flexibility for teachers to choose which types of training to attend. The most comprehensive training opportunity is the National Teachers' Conference, held for three days in the summer, which provides teachers with an in-depth look at the program, the VE Hub, and the curriculum; instruction on how to implement student-driven learning; and other promising practices shared by veteran facilitators. VEI strongly recommends that first-time teachers attend the national summer conference. Other training opportunities include regional meetings and ongoing virtual sessions, as well as on-demand access to regional consultants who provide teacher support.

The VE Hub is hosted by VEI and includes all instructional support materials, including scoring guides and rubrics, instructional videos, and other resources. A *teachers' lounge* section of the portal offers new resources for facilitators. VEI also supplies a pacing guide for planning curriculum delivery each

TABLE 4
Fidelity of Implementation, by Virtual Enterprises Core Component and School

School	Teacher Training and Support	Project-Based Curriculum and VE Ecosystem	Student-Driven Learning	A Business Environment in the Classroom	Extended Learning Opportunities
KHSD-A	Full	Partial	Full	Full	Full
KHSD-B	Full	Full	Full	Full	Full
KHSD-C	Full	Partial	Full	Full	Full
KHSD-D	Full	Full	Full	Full	Full
NYCPS-A	Full	Full	Full	Full	Full
NYCPS-B	Full	Full	Full	Full	Full

month, as well as an annual activities map that shows when the student businesses should complete ongoing tasks—such as paying rent and utility bills—and when these students should prepare for and attend regional and national competitions.

To assess implementation of the training component across schools, an online survey asked teachers about what types of VE trainings they had attended and who helped them with VE implementation. All teachers reported attending at least one training and receiving supports in some form. But the types of training varied; five of the seven teachers participated in one-day VE trainings, and four of the seven teachers had attended the National Teachers' Conference at least once.[2] As the teachers became more experienced, most did not continue to attend the summer conference and instead attended online support sessions or made appointments with VEI staff to address issues as needed. Three of the seven teachers reported participating in topical open office hours and two attended state or regional trainings. Five of the seven teachers reported having contact with regional VEI staff for implementation assistance.

The survey also asked whether teachers felt generally supported in implementing VE by various individuals, including VE regional or national staff, the individual at their school or district who oversees CTE programs (i.e., a CTE coordinator or director), school administrators, counselors, and other VE teachers. All teachers agreed or strongly agreed that they felt supported by the regional VEI staff, and all but one agreed or strongly agreed that they felt supported by VEI national staff. There was less agreement on support from various leaders and staff within their schools and districts; some teachers from both districts reported that they disagreed or strongly disagreed that they felt supported by district and school staff.

In interviews, teachers were positive not only about the training offered by VEI but also VEI's responsiveness to ongoing teacher needs and suggestions. With regard to the initial training, one teacher said, "If you're going to do Virtual Enterprise well, as a new teacher, I found that three-day training of monumental importance." Another teacher said, "What VE does very well is they listen to facilitators. When we go to the meetings, you feel like you're being heard."

In sum, we found that the VE program offers many training and support resources, and teachers varied in which resources they used. Most of the teachers reported receiving sufficient support from regional VEI program staff, while opinions were mixed on local support.

Teachers Varied in the Degree to Which They Delivered Foundational Components of Virtual Enterprises International's Project-Based Curriculum

VEI's task-based curriculum is highly specified, which prior research associates with greater implementation fidelity (Carroll et al., 2007). The program clearly stipulates the sequence and timing of delivery. Some units or tasks are designated as foundational tasks that all students in the course are expected to complete, and some tasks are specific to only certain departments of the business (Box 2). The curriculum also designates whether tasks are *core* requirements; all foundational tasks are core requirements, and some department-specific tasks are core requirements as well. For example, developing an e-commerce website is a core requirement task for the information technology department. These core requirement tasks make up about 60 percent of the 175 tasks in the overall curriculum. Schools are expected to cover foundational and core tasks, and beyond those, teachers can draw from the additional task units.

In NYCPS, all three teachers reported completing the five foundational orientation tasks. In KHSD, all four teachers reported completing two of the foundational orientation tasks (Introduction to Virtual Enterprises and Orient Students to the VE Portal), while schools varied in their completion of the remaining three foundational orientation tasks (Work as a Team, Understand Time Management, and Communication Strategies). All seven teachers reported that their students had developed a four-page executive summary

BOX 2

A Description of the Different Types of Curriculum Components

Foundational tasks

There are 17 tasks that the VEI curriculum encourages all students in the course to complete, such as

- Introduction to Virtual Enterprises
- Work as a Team
- Understand Time Management
- Communication Strategies
- Establish Meeting Procedures.

In addition, there are foundational tasks in Design Thinking to help students select their business's focus, Career Development to match their skills and abilities to jobs and complete the role placement process, and Business Registration to complete their initial business setup and budget.

Department tasks

These are tasks that the VEI curriculum assigns by department of the simulated student business, such as

- Accounting and Finance: Set up your business in QuickBooks
- Operations and Information Technology: Create a presentation on trading procedures for employees
- Management, Risk, and Legal: Identify firm goals, objectives, and strategies
- Sales and Marketing: Prepare sales projections; prepare a branding packet
- Human Resources: Create an employee evaluation process and policy.

document and an e-commerce-capable website, which are core tasks. All reported that their students traded with other firms in their region (another core task), and all but one KHSD classroom had traded with other firms in the United States. Only two of the teachers, one in KHSD and one in NYCPS, reported creating an annual report.

In interviews, all seven teachers reported implementing the curriculum in a fairly consistent fashion from year to year, covering what they consider to be the essential tasks but also modifying the curriculum at times. One teacher noted that it's a "good, solid curriculum" while also saying that he uses a "buffet approach." Others acknowledged that VEI lacks the staff to regularly update the curriculum, so reflecting or incorporating current events is up to the teacher—"tweaking old lessons to fit new things happening in the world." For example, an NYCPS teacher had his students researching and learning about tariffs when those became a national issue.

Several teachers also pointed out that the curriculum in the VE Hub is not specific to any industry. So, when launching a new firm each fall, both teachers and students must do some research on their own and find employer partners in the industry of the new firm. Teachers must also guide the students in learning about the industry; one teacher said that early in the school year students might spend two to three weeks just studying the industry. In addition, because the KHSD programs yield course credit for economics, those teachers must be sure to incorporate sufficient content in that area.

In sum, we found strong use of and positive perceptions of the VE curriculum but variation in how much of the foundational and core content was covered. We therefore assess the curriculum as being implemented with partial fidelity in two KHSD schools. We relied on teacher survey responses to assess whether they covered core requirements and did not assess the overall quality of the content delivered.

Teachers Acted as Facilitators in Virtual Enterprises Programs

In addition to providing a structured curriculum, VEI provides detailed guidance on pedagogy. VE teachers should primarily be facilitating student-driven learning. The program also encourages peer learning approaches (e.g., student department heads overseeing and guiding the work of other classmates). We measured fidelity to student-driven learning through the teacher survey, interviews, and classroom observations.

Survey findings provided strong evidence for the desired student-driven pedagogical approach. All teachers reported having confidence in their facilitation of classroom activities. Teachers from both districts agreed that VE created opportunities for student-driven learning. All teachers were unanimous that VE students solved their own problems. All teachers agreed or strongly agreed that the program helped students become self-directed learners and fostered collaboration and teamwork. All but one NYCPS teacher agreed or strongly agreed that throughout the VE course, students had involvement in planning or designing, organizing, leading, and evaluating or reflecting.

> “ We found strong use of and positive perceptions of the VE curriculum but variation in how much of the foundational and core content was covered.

Our classroom observations also demonstrated student-driven pedagogy; teachers circulated around the room to see if they could be of any help to the students as they worked in their corporate departments. In one case, a teacher provided feedback to a small group of students who were practicing their presentation for the business plan competition. We did not witness any of the teachers presenting a lesson or lecturing in a traditional way. One teacher described his approach:

> So I have a statement I live by: Don’t come asking me a question if you’re not going to tell me what you tried to do to learn it already. So that usually involves a number of students working together, troubleshooting, sharing, researching, sharing what their issues are, and then coming to me and saying, Is this right? Or, here’s what we’ve done and we still don’t get it.

In interviews, students described the VE course as being different from their other courses and more student-driven. One student said:

> We run the class. We need to show initiative and do our work because we know what affects our future and the success of our company. And [the teacher] helps us . . . but it’s really us that does everything.

Other students mentioned “you learn on your own” and “you have to be able to teach yourself.”

Students not only taught themselves but also one another. Several teachers described peer-driven pedagogy; for example, students in the accounting department had to first learn how to prepare their own 1040 tax returns and then teach the rest of the class how to do it. Students also emphasized that student-driven learning included ongoing opportunities for peer engagement. One student described the class as “a year-long group project,” as opposed to occasionally having brief team assignments in other classes. In talking about the frequent opportunities to engage with peers, one student noted:

> I really, really like the fact that we can communicate in this class. Other classes you’d be quiet, you listen to the teacher, you take notes, you do your homework. But in this class you kind of have the opportunity to actually engage with the people around you.

In sum, our evidence suggests that all teachers effectively implemented student-driven learning. Rather than lecturing and leading class discussions, teachers acted as facilitators while students worked on projects—a strong contrast with many high school classrooms.

> “ Our evidence suggests that all teachers effectively implemented student-driven learning.

Virtual Enterprises Programs Created a Business Environment in the Classroom

VEI's guidance on creating a business environment in the classroom specifies that classrooms should be arranged to mimic office spaces. VEI also recommends that classrooms adopt a common business culture and practices, such as filling out timesheets and operating as departments. The aim of this component is to provide a simulated workplace that facilitates student engagement and deepens the immersive quality of the classroom-based WBL model.

The five VE classrooms we observed had conference tables and computers for each student, and some had office-type chairs. According to an interview with the teacher in the school we were unable to visit, the classroom setup included office-like computer workstations. The rooms held a great deal of technology, including large computer monitors, copy machines, and video screens. In one classroom, a large screen showed month-by-month projected and actual revenue and expenses for the firm. Another classroom had a stock ticker. In the teacher survey, all teachers agreed or strongly agreed that they had sufficient classroom materials, equipment, and technology in good condition and maintained by their school and that students frequently used technology as it would be appropriately applied in a simulated business.

The five VE classrooms we observed had conference tables and computers for each student, and some had office chairs. According to an interview with the teacher in the school we were unable to visit, the classroom setup included office-like computer workstations. All teachers reported that they grouped student seating by company department. The rooms held a great deal of technology, including large computer monitors, copy machines, and video screens. We observed that the classrooms were decorated with VE signs and awards, as well as employee-of-the-month posters.

In the survey, each KHSD and NYCPS teacher reported implementing two to four activities in the first few class sessions to help students feel as though they were in a business setting, such as team-building activities, orientation meetings, physical or electronic folders, and a syllabus in memo format. All but one teacher reported adjusting their procedures compared with a typical classroom so that students had more autonomy, such as allowing students to sign themselves in and out to use the bathroom. NYCPS teachers were more likely to report additional adjustments to reinforce the business environment, such as having students refer to the teacher as their facilitator, having students refer to one another as coworkers or by their business titles, having human resources take attendance, and having specific “clock-in, clock-out” procedures. In one classroom, a sign read “Remember to do your time card.”

Most KHSD teachers agreed that the VE program provides students with an understanding of the expectations of the workplace, while all NYCPS teachers strongly agreed this was the case. All seven teachers reported that their students understood workplace vocabulary in the VE program and agreed or strongly agreed that the program fosters collaboration and teamwork.

Overall, we found that VE classrooms were distinct from traditional classrooms and did bring in aspects of a business environment in terms of both physical materials and a business-like culture and processes.

All Virtual Enterprises Programs Participated in Extended Learning Opportunities

Activities outside the classroom—both in-person and virtual—are a significant part of the VE program. Regional and national competitions offer students opportunities to engage with peers and employers and demonstrate their skills. The VE program offers multiple competitions held virtually and in person, from one-minute elevator pitch contests to higher-profile business plan competitions that must include various types of financial and competitor analyses, among other elements.

The Youth Business Summit is a multiday event held in New York City every spring, and attending it is a desired goal for school VE programs. At the 2025 summit, 4,600 students from VE companies across 14 states and eight countries participated, hosting approximately 250 trade booths. In addition to the trade fair, the Youth Business Summit hosts the national competitions for VE firms that show success in regional contests. In 2025, eight finalist teams competed in the National Business Plan Competition. Each team of six students—wearing business attire—made a timed presentation about their firm and product and then answered questions from the judges. Teachers described how many of the group tasks performed in the classroom serve to prepare students for trade shows, during which they sell products to and buy products from other VE firms, and for competitions.

All teachers reported participating in the three primary types of extended learning opportunities: local or regional business plan competitions, the various national competitions (e.g., elevator pitch, company branding, website, company newsletter), and trade shows. In interviews, teachers expressed some variation in how much emphasis they placed on the competitions. For example, one KHSD teacher said that they are the "driving force on why a lot of students get into the program and the fact that they're putting in like all this work in the classroom," while other teachers downplayed the competitive aspect. Still, the teachers reported that all of the students participate in these learning opportunities in some way. Students also described participation in extended learning opportunities; one student said:

> I feel like a major aspect of Virtual Enterprise is definitely public speaking and salesmanship. We all go to trade shows where everyone has to sell products to actual people, and you have to learn how to pitch a product to a person, not just talk about the project, actually make a sale. And I believe most if not all of us also have verbal presentations in front of judges.

VEI provides students with connections to business professionals through the many competitions and events that it hosts. We found that the extent to which individual classrooms had additional opportunities to interact with outside professionals was mixed. Two KHSD teachers did not report any regular meaningful interaction with employers, while the other two KHSD teachers reported just one to ten hours per year with such individuals. One NYCPS school reported one to ten hours of employer engagement per year, and the other reported 21 to 30 hours per year. Despite more-limited engagement with business partners by some VE teachers, the interviews offered many examples of support from outside professionals. Teachers reported that business partners—some of them VE alumni—provided feedback to assist students with preparation for competition. One of the New York City programs made in-person visits to the offices of Pfizer and Google.

Overall, we found that students in the VE programs at the schools we studied consistently participated in extended learning opportunities. In KHSD, the national competition travel and regional travel were a bigger emphasis of the program. We also found that employer engagement in program activities varied across classrooms.

> "Students in the VE programs at the schools we studied consistently participated in extended learning opportunities.

Funding and Program Support Were Key Facilitators; Time Demands Were the Main Barrier

We asked VE teachers and school leaders about factors that helped and hindered the implementation of VE. We first describe the facilitators and then describe barriers.

Funding, Support from Program and District Staff, and Student Preparation Were Top Facilitators

Our interviews with teachers and leaders identified four facilitators that supported implementation of the VE program:

- **Funding**—District support was critical, especially financial support, because participation in some of the extended learning opportunities requires funds for travel. The Perkins program (the federal funding stream for CTE) was noted as an important funding source, as were state CTE funds. However, these sources of support were not always enough to cover travel to all of the events, especially for the KHSD programs that took students all the way from California to the Youth Business Summit in New York City. To fill gaps in travel expenses, some of the KHSD schools engaged in local fundraising.
- **Support and training from program staff and from district staff**—All of the teachers expressed feeling supported by the regional VEI staff in surveys and interviews. Teachers perceived VEI staff as accessible and responsive. KHSD teachers noted that the district hosts some student leadership events and helps to make connections to employers in the community. The teachers also mentioned that they received support from administrators, other teachers in their schools, and VE teachers from other schools.
- **Embedding the course into a business pathway**—VEI recommends that students complete an introductory business course before enrolling in the capstone VE course. Several of the schools embedded the course in a business pathway or offered an introductory VE course and reported that this preparation was helpful in supporting a successful program. However, VE was a stand-alone course in two schools.
- **Selection of students for the course**—In addition to requiring prior business coursework, some schools required students to complete applications or interviews, and some teachers selectively recruited students from advanced courses. The teachers who used these selective processes saw them as valuable because they ensured that students were ready for and likely to engage in the program.

Schools Faced Few Barriers Other Than the Time Requirements for Implementing Virtual Enterprises

Teachers in the six study schools did not describe many significant challenges or barriers. The teachers were experienced and had volunteered to teach the program and participate in the study, so their perspectives might not reflect those of the average VE teacher. Interviewees mentioned two barriers:

- **Lack of time**—All teachers reported that insufficient time was an issue and more time was needed to cover all of the VE content and to prepare the students well. This was true even for the NYCPS teachers who have a double period each day for VE. In addition, teachers mentioned that there was competition for their students' time; many students juggle VE with sports, Advanced Placement exams, and after-school jobs. One teacher said, "A lot of times if I'm meeting with them after school, I'm meeting with them at 6:30 or 7:00 at night so that they can clear those other activities off their plate." In addition, student schedules can conflict with extended learning opportunities, particularly those involving travel to other locations.
- **Recruitment challenges**—While most of the schools did not face challenges recruiting stu-

dents and were able to be selective about who participated, one KHSD teacher expressed needing more assistance from counselors for sharing information about the program and recruiting students. That particular school offers students many other pathways in addition to VE.

Teachers and Students Were Enthusiastic About Virtual Enterprises and the Benefits for Students

Our survey and interview data showed consistently positive views of the VE program among teachers and students. In the following sections, we describe the evidence for teacher and student enthusiasm for the program and the perceived benefits of the program.

Teachers and Students Expressed Enthusiasm for the Program

All of the teachers across the six schools strongly agreed with the survey item that they "look forward to teaching the VE program every day." In interviews, teachers expressed enthusiasm about teaching VE; one said it has "revitalized my teaching" and another described himself as an advocate and cheerleader for the program. One teacher mentioned enjoying watching students as they face challenges and grow, noting that this "builds confidence, self-esteem, camaraderie." Other teachers mentioned that they enjoy watching their students interacting and developing interpersonal skills.

Students also expressed enthusiasm for the course. In the student survey, most VE students in both districts agreed or strongly agreed with the following statements: "I enjoy my VE class more than my other classes" (82 percent in KHSD and 76 percent in NYCPS) and "I look forward to attending my VE class every day" (83 percent in KHSD and 77 percent in NYCPS). Students viewed the course as challenging but fun, and they reported that the interactive and interpersonal aspects were particularly valuable. One student noted, "Although you had stuff to do, like work, you could be working and talking, you could be collaborating." Another student explained, "I'm not worried about getting a hundred percent in his class or a test. I am worried, my stress is to make sure that everything is done so that everyone can do their part. I feel like that's where the stressor is."

Teachers and Students Perceived Benefits for Students in Career Awareness, Technical Skills, and Career Readiness

Our findings from interviews and surveys with VE teachers and focus groups with VE students point to several ways in which the VE program benefits students.

Career Exploration

In the survey, all teachers agreed or strongly agreed that the program helps motivate students to identify and pursue their career and postsecondary education goals. In interviews, teachers also noted the strong career exploration that occurs through the program as students learn not only about the demands and tasks of their own position in the firm but also what other departments do. All students learn about business and finance, but they also learn about and experience other areas—such as human resources, marketing, and accounting—found in all types of organizations, not just for-profit businesses. As one teacher said, "Some of them never heard of human resources, they didn't know that was a career."

Students also described the course as helping them to understand various types of careers and identify occupations that fit with their personal interests and talents. As one student said, "I knew that I liked graphic design and media arts, but I wasn't really sure how or where it would fit into a real-life job. And I think this has really helped with that."

New Technical Skill Sets

Evidence from interviews with teachers and student focus groups suggests that students gained an array of new skills related to business operations. Students built skills with technology platforms and applica-

tions, such as Google Sheets, Microsoft Excel and PowerPoint, and Canva. They learned web design and created and maintained social media accounts for their firms on such platforms as LinkedIn and Instagram. All teachers reported that students understood workplace vocabulary and were comfortable speaking about mortgages, stocks and bonds, balance sheets, marketing strategies, and human resources, as a few examples. One teacher emphasized VE's role in building project management skills, and student focus groups also highlighted people management skills as being important.

"One teacher emphasized VE's role in building project management skills, and student focus groups also highlighted people management skills as being important.

Career Readiness

Beyond technical skills, VE also appears to build broader career readiness competencies that are likely transferable to many different types of workplaces and industries. Although there are varying definitions of *professionalism*, many cite attitudes and behaviors, such as effective communication, ethical behavior, respect for others, accountability, and responsibility—including taking responsibility for one's mistakes (Van Dam, 2024; Verasai, 2023). These themes came up repeatedly in teacher interviews and student focus groups.

All surveyed teachers agreed or strongly agreed that the program provides students with an understanding of workplace expectations and fosters collaboration and teamwork. Teacher and student interviewees noted that the development of communication skills is an important part of the program. Students must learn how to effectively communicate with one another, as well as with outside partners and at competitions. As one student said, "It's like we are learning about business, but we're also learning how to be a part of a business." Another student said, "Being able to work with others seamlessly is something that you can take into your real life." Communication with colleagues might entail providing or receiving constructive criticism—"You got to have hard conversations," said one student. A teacher noted the importance of his students learning how to look people in the eye and shake hands. An assistant principal in NYCPS spoke about how VE students learn how to network with businesspeople. Students mentioned how the program increased their confidence in public speaking.

All responding teachers also agreed or strongly agreed that the program allows students to apply creativity and innovation and helps students become self-directed learners. Interviewees repeatedly mentioned responsibility and accountability as important skills that students gained from the VE program. One teacher said,

> In the real world, if somebody misses a deadline, the entire organization's going to know who missed the deadline. If they can miss those deadlines here and be held accountable, there's a high likelihood they won't miss as many of them when they're professionals.

A student used the word *humility* to describe the importance of understanding her role in the business and how students in the program all necessarily rely on one another. Another student said, "Well, sometimes it felt like I didn't want to, it wasn't very important at some point, but then it gets in my mind there's other people depending on my work, so I had to do it." These perspectives suggest that VE was helping to build career readiness skills related to responsibility and accountability as a team member.

Finally, students in VE also had opportunities to build financial literacy, which is important as students enter college and begin careers, open bank accounts, and manage their income, investment accounts, and spending. One student noted that VE "has definitely exposed me to a lot of new ideas that I didn't necessarily know before about what I needed to be doing to secure my financial future."

Costs Varied Widely Across Schools, and Compensation and Travel Were the Primary Cost Drivers

We conducted an analysis of 2024–2025 school year VE program costs across the six study schools. Because this report aims to inform district and school decision-makers considering models of WBL, we examine costs from the district and school perspectives. In a future impact report, we will capture costs more comprehensively and combine cost data with program impacts to assess cost-effectiveness, which would allow decision-makers to compare the return on investment across different WBL and CTE models. To our knowledge, this is one of the first studies to provide empirical cost estimates for a high school WBL program, addressing a gap in the cost-analysis literature (Dougherty and Smith, 2025).

We examine total costs incurred by schools and districts for the VE program. We also break these costs into core costs, flexible costs, and optional costs. *Core costs* are the costs that every school must incur to offer VE: (1) teacher compensation and any additional VE-specific salary stipends and (2) the annual licensing fee for the program, which includes access to the ecosystem, training, and support. *Flexible costs* are costs that many schools might incur as they implement the program, but these costs may vary substantially across schools and over time. Flexible costs include (1) training, (2) business equipment, (3) travel costs for regional competition participation, and (4) administrative expenses. Finally, given that only a small subset of schools who qualify for the Youth Business Summit in New York City are required to (or have the opportunity to) travel, we classify this as an *optional cost*.

Table 5 reports total and per-student costs for each school. Total annual costs ranged from $46,478 to $120,482 for schools with one program. NYCPS-A had three programs, putting per-program costs at approximately $62,000, which was comparable with several of the other programs.

Teacher compensation was the largest cost across most schools, accounting for between 32 and 92 percent of total costs. Teacher compensation was higher in NYCPS because the program occupied a larger share of the teaching load (i.e., two periods of class rather than one). Training costs were highest in the school with a newer teacher. Business equipment varied across schools. One school built a dedicated VE classroom with cubicles, a chief executive officer desk, and dual-monitor workstations, at an annualized cost of about $5,000, while another delivered VE in an existing shared computer lab and reported no new VE-specific purchases. Cross-country travel to the Youth Business Summit accounted for half of the program costs in two KHSD schools, and regional travel was a prominent cost for all KHSD schools. NYCPS schools had minimal travel costs.

Total per-student costs ranged from $1,862 to $6,024. Table 6 breaks the per-student costs into core, flexible, and optional categories. Core VE costs (compensation and licensing fees only) varied from $1,682 to $2,877 per student. This represents the minimum investment that schools could make to implement the program. All schools in the study chose to invest in regional travel and business equipment, and the program developer recommends these as core program features, so it is reasonable to assume that schools will incur these costs. VE core and flexible costs ranged from $1,862 to $3,625 across schools. Travel to the Youth Business Summit (optional costs) added $2,400 per student at KHSD-A and $2,273 per student at KHSD-B. Class sizes, which ranged from 17 to 33 students,[3] also play a role in determining per-student costs.

The full description of our approach to cost analysis is in the appendix, but it is important to briefly highlight some of the assumptions and limitations that factored into our cost estimates. We used actual salary and benefit records for the four KHSD schools and the published district salary schedule for the two NYCPS schools when individual records were not publicly available. We allocated teacher compensation according to the share of a teacher's load devoted to VE, which assumes that the VE course requires effort comparable with other courses. If VE is more demanding, this approach understates the compensation attributable to the program. Finally, our estimates of

TABLE 5

Total Virtual Enterprises Program Costs, by Ingredient and School

Cost Category	KHSD-A	KHSD-B	KHSD-C	KHSD-D	NYCPS-A	NYCPS-B
Core Costs						
Teacher compensation (VE share, including benefits)	50,471	30,317	30,073	26,582	165,164	58,293
Stipend (KHSD) or overtime (NYCPS)	2,676	3,190	3,119	2,897	4,741	0
VEI licensing fee	3,500	3,500	3,500	3,500	10,000	5,000
Flexible Costs						
Training or professional development	0	0	1,950	0	500	0
Administrative or other	650	3,500	1,408	500	1,300	0
Equipment	0	1,000	1,600	5,000	2,600	0
Regional competitions	15,194	12,500	9,830	8,000	0	990
Optional Costs						
National competition	47,992	50,000	0	0	0	0
Total cost	120,482	104,007	51,479	46,478	184,305	64,283
Per-student cost	6,024 (*n* = 20)	4,728 (*n* = 22)	2,451 (*n* = 21)	2,734 (*n* = 17)	1,862 (*n* = 99)	2,922 (*n* = 22)

SOURCE: Features data from the cost tool, teacher survey, teacher interviews, and follow-up emails.
NOTE: Personnel costs were standardized to national-equivalent dollars using the Comparable Wage Index for Teachers 2022 (KHSD ÷ 1.045; NYCPS ÷ 1.160). We did not further standardize nonpersonnel expenditures because many reflect national program prices or school-level implementation choices rather than local labor-market prices. Some local price variation might remain in such categories as lodging, transportation, substitute coverage, and other staff costs for administration.

TABLE 6

Per-Student Virtual Enterprises Costs, by Cost Tier

Cost Tier	KHSD-A	KHSD-B	KHSD-C	KHSD-D	NYCPS-A	NYCPS-B
Core	2,832	1,682	1,747	1,940	1,817	2,877
Core and flexible costs	3,625	2,455	2,451	2,734	1,862	2,922
Total costs	6,024	4,728	2,451	2,734	1,862	2,922
Number of students	20	22	21	17	99	22

SOURCE: Features data from the cost tool, teacher survey, and follow-up interviews and/or emails with teachers.
NOTE: *Core* includes teacher compensation and the VEI licensing fee. *Flexible* includes regional travel and business equipment, and *total costs* includes these core and flexible costs plus the optional costs of national competition travel.

equipment costs do not capture the opportunity cost of resources that a school already owned and redirected to VE (such as utilities and shared computer labs). Our estimates therefore understate the capital and facility costs for schools that delivered VE using existing infrastructure.

We are also cautious in asserting that the costs for these six schools are representative of the average costs of the VE program to schools and districts. These schools have long-standing programs in districts that have engaged deeply with VE for more than a decade. New VE programs might face more upfront training and business equipment costs, while more established programs might have had lower costs. Districts and schools vary in the degree to which they engage in regional and national competitions, and KHSD schools might devote more resources to these activities than the average district.

Findings and Recommendations

VE is a widely used and potentially promising WBL model, and we described the implementation of the program in six schools. The study was limited in that it focused on a small subset of schools in the program's two longest-running districts. Nonetheless, these findings offer important lessons that we summarize in this section. We also offer recommendations for districts and schools that are considering VE or a similar WBL approach.

> "The extra time that teachers and students had to devote to the VE program was the only barrier to implementation reported across schools.

VE is not a typical high school course or even a typical CTE course. It is a unique WBL program with a project-based curriculum and student-focused pedagogical approach. The VE program is supported by a wide array of training and supports for teachers and a variety of additional content resources in an online VE hub. Students must work together for the benefit of the simulated firm that they have jointly launched and run together. The program is also unique in the extended learning opportunities it offers: visits to workplaces, speakers from businesses, and many competitions held online and in person.

Our study of VE programs at six schools draws from multiple data sources to provide rich, descriptive information on the core program components, how well they were implemented, and what facilitated or challenged full implementation. Implementation of VE may pose challenges to schools and teachers accustomed to more typical courses, yet, overall, we found full implementation across four of the five components and partial implementation of the VE curriculum in some programs.

VE teachers highlighted several factors that facilitated the program's implementation: support from VEI and district staff, embedding the course in a business pathway, and intentional selection of students. The extra time that teachers and students had to devote to the VE program was the only barrier to implementation reported across schools.

Teachers, administrators, counselors, and students described many benefits to students, from general business knowledge to specific technical skills to career exploration to career and workplace readiness (what have been called *soft*) skills. Teachers also described developmental benefits, such as growth in students' self-confidence. Both teachers and students shared that they enjoyed the course more than their other courses. A future report will document the findings of our rigorous impact study.

Program costs varied widely across the six schools. The core costs—teacher compensation and licensing fees—ranged from $1,682 to $2,877 per student. Flexible costs added an additional $44 to $794 per student. There are not comparable studies of single-year WBL programs, but one study estimated the cost of CTE pro-

grams to be approximately $3,900 per student (Dougherty and Smith, 2025). Two schools from KHSD paid for students to travel from California to New York City for the Youth Business Summit, which added approximately $2,300 to $2,400 in additional costs per student. We consider these costs optional because only a subset of schools with VE programs make this investment.

While there is strong interest across the country in WBL, schools have struggled to significantly expand WBL opportunities. More districts and schools could consider a simulated business model such as VE to scale WBL. Our research shows that with support from VEI, districts, and schools, and attention to the five core program components, VE can be implemented well across school settings.

Our findings suggest four recommendations for districts and schools that might be considering the VE program or a similar approach to running school-based enterprises.

Recommendation 1: District and school leaders should ensure that the CTE and WBL programs that they invest in have an evidence base. The empirical research on specific approaches to CTE and WBL is limited. Districts and schools need more evidence on effective models. In the meantime, districts and schools should ensure that the WBL approaches that they adopt have a clearly defined set of program features, and those program features should have some evidence of benefits for students. The core features of the VE program—teacher training and support, a structured curriculum, student-driven learning, exposure to a business environment, and extended learning opportunities beyond the classroom—have a clear evidence base. We found that the six schools participating in the study were able to implement the program features as intended, and teachers and students were enthusiastic about the program and reported multiple benefits for students. VE is a promising program that districts and schools can consider, and future research will document findings on the impact of the program on student outcomes.

Recommendation 2: School leaders and teachers implementing WBL programs, such as VE, can benefit from structured resources and support but also capitalize on flexibility to tailor the program. Instructors valued the robust set of training resources and curriculum, and structure can be essential to the successful delivery of instructional programs. However, evidence suggested that the six schools chose to implement the programs in varying ways. Some built the program into business pathways, and some schools created more-competitive application processes. Students in NYCPS received twice as much instructional time in the VE program. Travel and competition in regional and national competitions varied across schools; KHSD placed particular emphasis on the competitive aspects of the program.

Recommendation 3: Ensure sufficient funding for WBL programs, and if resources fall short, consider how to alter the design of the program while continuing to implement the core program components. The VE program may cost more than some CTE programs and traditional courses, but schools have two straightforward options that would allow them to lower program costs. First, limiting travel—particularly to the national competition—reduces optional costs substantially. Second, increasing class sizes spreads fixed costs across more students. Schools should weigh these trade-offs carefully, however: Travel to the national conference might be a valuable learning experience, and very large class sizes could diminish the benefits of the course.

Recommendation 4: Districts and schools should consider how the design of a WBL opportunity and the process for selecting students may limit access for students who might benefit. VE students across both districts were different from the overall student population: They were more likely to be White, had higher incoming test scores, and were less likely to be economically disadvantaged. These patterns were, in part, driven by how the schools designed the programs. The VE programs in the two NYCPS schools required prior business coursework and were built in as capstone courses. This helped to ensure that students had adequate incoming business knowledge, but limited access to the opportunity to those in the business pathway. The schools in KHSD added application and interview processes and considered such factors as grade point average. Schools valued the opportunity to select students and require prerequisites, and some emphasized the value of selectivity in ensuring a program was com-

petitive. These processes may help ensure that students who enter the program are well-prepared and increase their chances of winning competitions, but these processes may also exclude students who would benefit from the opportunity to engage in WBL.

APPENDIX

Research Methods

In this appendix, we describe our data sources and approaches to analyzing implementation and costs.

Data Sources

Our implementation and cost studies draw on a variety of data sources. Table A.1 provides an overview of the data sources for each research question, and we describe each source briefly.

We compensated schools or VE teachers who oversaw coordination around study activities and participated in data collection—$1,000 in the first two years, increasing to $2,500 in the 2025–2026 school year to recruit more schools.

Teacher Surveys

Teacher surveys provided data on how teachers implemented the program (i.e., fidelity of implementation) and costs of implementation. To develop the survey, we first consulted with VEI staff and reviewed VE materials to confirm the tasks and actions that take place when VE is implemented with fidelity. We also observed new teacher training sessions and reviewed training materials to understand VEI's general expectations of the teachers (who are also called facilitators) and pedagogy and model strategies for engaging and preparing students to complete the business activities. Using that information, we drafted survey items. We also drew some items from a teacher end-of-year survey that VEI hosts to inform teacher training and support efforts. VEI staff reviewed drafts of the survey. We conducted five cognitive interviews with VE facilitators to test whether the survey questions and items were clear and relevant and revised it accordingly. We then piloted the survey with five different VE teachers.

The final survey instrument included primarily fixed-response items with Likert-type response scales (e.g., agreement scales, frequency scales). The open-response cost questions asked, for example, about costs incurred for program equipment, travel for professional development and to events, and any out-of-pocket expenses. We sent links to the survey to all seven teachers at the schools participating in student data collection. The seven teachers had a 100-percent response rate, and teachers completed surveys every year that their schools participated in the study (i.e.,

TABLE A.1
Data Sources, by Research Question

Research Question	Admin. Data	Teacher Surveys	Teacher and Admin. Interviews	Student Focus Groups	Student Surveys	Observ.	Cost Tool
1. How did the schools deliver the program, and which students were served?	X	X	X				
2. Did schools implement the main components of the VE program with fidelity?		X	X			X	
3. What were the facilitators and barriers to implementation?			X	X			
4. What did students and staff perceive as the differences in VE from the typical course, and how did they perceive its benefits for students?			X	X	X		
5. What are the costs of the VE program for schools/districts?		X			X		X

NOTE: Admin. = administrative; Observ. = observations.

2024–2026 for KHSD teachers and 2025–2026 for NYCPS teachers).

Site Visits: Teacher and Administrator Interviews, Student Focus Groups, Classroom Observations

KHSD site visits took place in spring 2024 (two schools) and spring 2025 (one school), and NYCPS site visits took place in spring 2025 (two schools). We were unable to conduct a site visit to the sixth school because the teacher was on parental leave, but we conducted an online interview with that teacher and a telephone interview with one of the teacher's students in spring 2026. We also conducted online follow-up interviews with all other teachers at that time.

Site visits consisted of semistructured interviews with the VE teacher, administrator, and a school counselor; a focus group with between five and eight students in each of the five schools; and a classroom observation for each of the six teachers at the five site visit schools (we observed two sections at one of the NYC schools). We developed protocols for interviews, student focus groups, and classroom observations by consulting VEI program and professional development materials and were informed by the researchers' experiences with other CTE programs. Topics covered in the teacher interviews included teacher background information, VEI and school supports for the teacher, implementation challenges, participating student characteristics and student selection for the program, and the perceived benefits of the program for the students. The administrators and counselors were asked similar questions about program implementation, student selection, and benefits.

We asked students how they heard about the program and why they decided to participate, what were their expectations of the program, what their roles were in the firm and their tasks, how the course is different from their other courses, and about their future plans.

We recorded, transcribed, and analyzed the site visit interviews. Analysts looked for patterns, themes, and categories across the data sources to identify the most important findings related to implementation. We wrote site visit memos to summarize the rich, descriptive data and provide a full picture of how the program functioned, as well as the perceptions of teachers and students.

During the class observations, we noted the setup of the room (e.g., type and placement of furniture and technology) and documented the number of students. We circulated around the room and wrote a running record of student interactions and their activities. We wrote up the notes into narratives that described the classroom and what the teacher and students did during the class, noting such aspects as who did most of the talking (the teacher or students).

Student Surveys

We distributed online surveys to all seniors in our study schools in the last five weeks of the school year (spring 2024, spring 2025, and spring 2026 in KHSD and spring 2025 and spring 2026 in NYCPS). We report survey responses across all cohorts. Overall response rates across waves were 43.7 percent in KHSD (3,321 seniors) and 36.5 percent in NYCPS (896 seniors). Response rates were substantially higher for VE students. Our samples included 194 VE students in KHSD and 203 VE students in NYCPS. We draw on two items from the student surveys to examine the perceived benefits of participating in VE. One item asks students to report on whether they enjoy VE more than other courses, and the other asks whether they look forward to attending the course. These items were asked only of students who indicated they were enrolled in the VE course.

Cost Tool

The school cost tool was the primary source for school- and district-level costs associated with VE implementation for the 2024–2025 school year. The tool was completed by VE teachers and administrators and captured costs across categories, including program fees, training, equipment, competition travel, transportation, administrative expenses, and other VE-related costs. For each item, respondents provided the item or service description, number of units per year, total expenditure, whether the amount was actual or estimated, whether any portion was donated or subsi-

dized, and explanatory notes. This structure allowed us to capture the cost components and the contextual information to interpret variation across schools.

Our Approach to Implementation Analysis

Implementation fidelity captures the extent to which a program is delivered as its model specifies. Measuring implementation fidelity matters for interpreting evaluation results: If a study finds null results, those may reflect poor implementation rather than proper implementation of an ineffective program. Studies of program implementation also help education practitioners understand barriers and facilitators to program operation.

Our approach to measuring program fidelity draws on Carroll et al.'s (2007) conceptual framework and review of the literature. Fidelity can be measured across at least five elements: *adherence* (the program is delivered as designed), *dosage* (all components are delivered in the frequency and duration intended), *quality of delivery* (components are delivered effectively), *participant responsiveness* (participants engage with the program), and *program differentiation* (the essential components necessary to the program's intended effect are identified).

Several factors can shape implementation fidelity, including the structure provided to a curriculum, training and support strategies for program implementers, and participants' views. For example, well-planned, well-specified interventions tend to achieve high fidelity, as do those with established training and support strategies that make program delivery more uniform (Carroll et al., 2007). Fidelity can also be higher when those delivering an intervention and the students participating are enthusiastic about it (Carroll et al., 2007). Program context and variation among program contexts may also affect implementation fidelity (Hill et al., 2023; Weiss, Bloom, and Brock, 2014).

We measured fidelity for each of the core components of the VE program described in Figures 1 and 2. We report fidelity at the school level rather than the teacher or program levels, so we combined sections in one of the schools. Using the data sources described previously, we developed items that captured fidelity for each of the core components (Table A.2 provides examples). We count as *full implementation* any case in which evidence from every data source for that component shows delivery of the program model (adherence) and as *partial implementation* any case of incomplete adherence.

We conducted qualitative analysis of our interview data using predetermined codes to align with our research questions, including implementation of the five core components, facilitators and barriers to implementation, and perceived benefits of the programs.

Estimating Program Costs

Because this report primarily targets districts and schools, we focus on school and district costs. Our analysis was inspired by the ingredients method to identify the resources required to implement VE, measure the amount of each resource used, and assign a cost to each resource (Hollands, Pratt-Williams, and Shand, 2020; Levin et al., 2018). However, given our focus on district and school costs, we excluded many of the costs that would typically be included in the ingredients method, such as utilities, teacher and student time out of class, and out-of-pocket costs. We did collect data on many of these costs and will conduct a more-comprehensive cost analysis in our separate cost-effectiveness analysis.

The cost tool provided most of the program-specific costs, but we drew on three other sources. The teacher survey supplied additional information on teachers' time allocation to VE. We obtained personnel cost prices from publicly available salary data: actual salary and benefits data from Transparent California for the four KHSD schools and the salary schedule for the two NYCPS schools. All costs reflect the 2024–2025 school year. Finally, we conducted follow-up interviews with teachers and administrators to validate figures, clarify responses, and resolve inconsistencies across sources.

We calculated costs of certain resources for which only a portion was devoted to VE by combining quantities with prices—for example, the share of teacher time devoted to VE and the compensation rates (i.e., inclusive of salary and benefits) of these staff. In other cases, schools reported costs fully attributable to VE, such as the program licensing fee. Once we

TABLE A.2

Examples of Data Sources Used to Assess Fidelity of Implementation

VE Core Component	Teacher Interviews and Student Focus Group Topics	Teacher Survey Items	Classroom and Trade Show Observations
Ensuring teacher training and support	Teachers discussed VE trainings attended, supports received from VE staff, as well as from school and district staff	• Have you ever attended one of the following VE trainings? Select all that apply. • If you need help implementing the VE program, whom do you go to? • In implementing the VE program at my school, I feel supported by . . . etc.	—
Engaging with the project-based curriculum and VE ecosystem	Teachers described their approach to selecting which pieces of the curriculum to implement given various demands, such as educating students on their selected industries	• Which Foundational Tasks did you complete this year? Communication Strategies; Understand Time Management, etc. • By the end of the school year, will your class have engaged in the following: – Developed a business plan – Participated in a local/regional business plan competition – Participated in a national business plan competition – Participated in a VE trade show – Traded with other firms in my region; etc.	Observed students enacting the tasks prescribed in the curriculum according to their department
Facilitating student-driven learning	Teachers discussed how they structured the course to be student-driven; students discussed their experience of directing their own learning	• How much do you agree with the following statements? 4-point Likert Scale, Strongly Agree to Strongly Disagree: – In every step of the class, students had involvement in planning or designing; organizing; leading; evaluation or reflecting – The VE program helps students to become self-directed learners – I confidently facilitate the VE model in the classroom • Did your students do the following in the VE program (No, Somewhat, Yes) – Students solve their own problems	Observed students directing their own learning and problem-solving alone and in small groups as they fulfilled their simulated business roles
Creating a business environment in the classroom	Teachers described how they structured the physical environment and adapted expectations for professional behavior compared with other courses	• Did your students do the following in the VE program (No, Somewhat, Yes): – Students frequently use technology as applied in business • What have you implemented in the classroom to simulate a business place? Select all that apply. – Desks grouped by company department; procedures adjusted compared to typical classroom, etc.	Observed the setup of the classroom seating within the department and the available technology
Providing extended learning opportunities	Teachers described their approach to incorporating student preparation for competitions into their curriculum and the emphasis placed on competitions; they discussed connections to business professionals and community volunteers	• By the end of the school year, will your class have engaged in the following: – Participated in a local/regional business plan competition – Participated in a national business plan competition, including Elevator Pitch, Company Branding, E-Commerce Website, Company Newsletter, or Video Commercial – Participated in a VE trade show	Observed students preparing for competitions; observed students competing at the VE National Trade Show

calculated total costs for a school attributable to VE, we divided costs by the total number of VE students. We describe variation in costs across the six schools. We also categorize costs into core costs (e.g., program licensing fee, teacher compensation), flexible costs (e.g., regional travel, business equipment), and optional costs (e.g., national competition travel). Many schools do not travel to the national Youth Business Summit, and other costs, such as equipment investments and regional travel expenses, vary across schools depending on their districts' and schools' resources and preferences. We will use total costs in our subsequent cost-effectiveness analysis, but we consider core costs to be the minimum costs a district or school might incur to implement the VE program.

Accounting for Teacher Time

To assess the value of teacher time, we allocated each teacher's compensation according to how much of their teaching load was devoted to VE. The course accounted for 20 percent of a teacher's time in three KHSD schools, 40 percent in one KHSD school and one NYCPS school, and 110 percent across the two teachers and three programs in the other NYCPS school. We then multiplied these teacher loads by compensation.

Our sites span two districts with different local wage levels, so we standardized personnel costs to national-equivalent dollars using CWIFT, which adjusts for regional wage differences among comparable college-educated workers (Cornman et al., 2019; Taylor and Fowler, 2006; see also Levin et al., 2018). We used the 2022 CWIFT index values (values are stable from year to year, and there is little reason to expect they have shifted materially since 2022). We divided each school's teacher compensation, stipend, and overtime by its district value on this index, which was 1.045 for KHSD and 1.160 for NYCPS.

We accounted for additional stipends paid to teachers, but we cannot be certain that this accounts for all of the out-of-class time teachers spent on VE. Because most teachers reported little or no additional VE time, adding these indirect time costs is unlikely to materially affect estimates. However, if we included indirect program costs as the ingredients method calls for, teacher costs would be slightly higher.

How We Annualized Multiyear Equipment Costs

Some equipment purchases support VE for multiple years, so counting the full purchase price in the year of purchase would overstate the annual cost of the program. We therefore annualized VE-specific capital items, such as office furniture, cubicle workstations, a chief executive officer desk, dual-monitor workstations, and stock-ticker displays, over a five-year useful life at a 3.5-percent discount rate (Levin et al., 2018). These items were not required uniformly across schools; rather, they reflected local decisions about how to create a businesslike classroom environment. Five years is a reasonable useful-life assumption for mixed classroom technology and equipment. Some items, such as office furniture, might last longer, and extending the useful life from five to seven years would reduce the annualized equipment costs by one-quarter. However, equipment was a relatively small share of measured costs; this alternative assumption would not materially affect our overall findings.

We excluded general-purpose classroom technology that districts replaced on their standard scheduled irrespective of VE, as well as the opportunity costs of existing classrooms and shared technology used for VE. Ideally, shared durable resources would be valued by the share of their capacity devoted to the program, similar to how we allocated shared teacher time. However, we lacked the usage, replacement cost, square footage, and scheduling data needed to value these resources consistently across schools. As a result, capital and facility costs are likely understated for schools that relied heavily on existing infrastructure. We return to this issue in the limitations section.

Limitations of Our Cost Estimates

Our estimates rely on self-reported and public data and might therefore be subject to measurement error. We are also missing data on some costs, which might bias our estimates downward. For example, we captured VE teachers' time but collected only limited data on

other staff, such as principals, curriculum coordinators, and district CTE staff, who might also contribute to implementation. As discussed previously, we also did not value the opportunity cost of shared facilities, classroom space, and general infrastructure.

To gauge the possible size of this omission, we applied an illustrative classroom-valuation approach based on the Institute of Education Sciences Cost Analysis Starter Kit (Institute of Education Sciences, 2020).[4] The results show that the omitted opportunity cost of using existing classrooms is roughly $45 to $178 per student, which is less than 7 percent of essential costs at every school. Therefore, our findings understate the full economic cost of VE modestly without altering the main pattern of the findings.

Because of these limitations, our estimates should be interpreted as lower-bound estimates of what schools and districts spend to deliver the VE program. Additionally, our estimates do not account for the costs incurred by students and families or any efforts of external organizations associated with the VE program.

Another limitation of both our implementation analysis and cost analysis is the representativeness of our schools. As established programs, some of the schools might be investing less now in training and equipment costs than in the past. The VE courses we studied were largely at capacity so might have been cheaper than other VE courses on a per-student basis. On the other hand, most of the teachers were experienced and might have had higher-than-average compensation. And several of the schools in the study paid substantial amounts to support travel to the national competition, which is not a cost that many VE schools incur.

Notes

[1] This is one of several reports from a comprehensive study of VE; another report focuses on student access to the program (Berglund et al., 2026), and future publications will examine the program's effects on student outcomes.

[2] One of the teachers began teaching VE before the National Teachers' Conference was established, and another teacher said that they chose to spend limited funds on student travel rather than their own conference attendance.

[3] We could not identify individual course sections in our data, so we assume that the 99 students at NYCPS-A were equally distributed across the three classes.

[4] The Institute of Education Sciences Cost Analysis Starter Kit provides an illustrative approach for valuing classroom use by estimating a room-hour cost from a classroom replacement value, expected useful life, and annual available instructional hours. We used the Starter Kit's illustrative values, such as the $235,000 replacement value of a classroom, 30-year useful life, and 1,440 available instructional hours, which came to about $5.44 per room-hour. We then prorated the number of periods per day that VE occupied the space at each school. These figures are a rough approximation and are not intended to provide a measured site-specific cost.

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About This Report

In this report, we examine Virtual Enterprises (VE), a work-based learning (WBL) program offered as a course in hundreds of high schools across the United States. We aim to inform district and high school leaders who are considering evidence-based approaches to WBL. We also aim to contribute to the evidence on promising career and technical education models. RAND, EdWordian, and the American Institutes for Research (AIR) conducted a study examining the implementation, costs, and impacts of the VE program in six schools: four in the Kern High School District and two in New York City Public Schools. This report is focused on implementation and costs. In it, we find that the schools implemented the program as intended and that program costs varied across schools; travel costs and class sizes drove much of the variation. In other papers in progress, we examine how students access the VE program and differ from students not participating in VE, as well as the impacts on career readiness and college-going.

RAND Education, Employment, and Infrastructure

This work was conducted in RAND Education, Employment, and Infrastructure, a division of RAND that aims to improve educational opportunity, economic prosperity, and civic life for all. For more information, visit www.rand.org/eei or email EEI@rand.org.

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