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When the Virtual Becomes Real: Student Learning in the Virtual Enterprises Program

Katherine L. Hughes and Joanne Wang Golann

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When the Virtual Becomes Real:
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A visit to the Baskets and Bouquets firm begins with a stop at the reception desk where guests are signed in and then announced to the CEO and CFO. The space looks like a typical office, with a dozen or so employees at cubicle work stations. There is the usual office furniture and equipment: a conference table, filing cabinets, a color printer, a fax machine, a copier. The employees, dressed in business clothes, are focused on their jobs, whether they're working independently or in groups.

A visitor might stop by the Sales and Marketing Department and observe an employee designing a new logo for the firm or a new catalogue of products. An employee in the Human Resources Department may be seen using Photoshop to create employee ID cards or planning a conflict resolution workshop. Members of the Accounting Department might be hard at work on the firm's business plan, preparing for an upcoming presentation to potential investors.

This firm may seem like a typical business, except that it is located within a New York City public high school and is run by 17- and 18-year-old students. It is part of the Virtual Enterprises network. While the firm's products and revenues are virtual, the work is real.

Now approaching its twelfth anniversary, Virtual Enterprises International (VE) is a high school program that teaches students about business through task-oriented and hands-on coursework. With the assistance of a coordinator and business mentors, VE students create and oversee a virtual firm, conducting business with other virtual firms nationally and internationally. The program enables students to learn about careers, develop interpersonal and organizational skills, and use technology. In some VE firms, students also study an applied economics curriculum, thereby linking the business enterprise to an academic subject required for high school graduation and increasing the academic content of the VE coursework.

Participation in Virtual Enterprises is presumed to benefit students on a range of outcomes, including career preparation, college planning and readiness, and engagement. While the VE Central Office collects its own data on the program, there has been little research conducted externally. Thus, the VE Central Office invited the Institute on Education and the Economy (IEE) at Teachers College, Columbia University, to undertake a one-year, mixed method, multi-site study of the program with a focus on the influence that VE has on students' career and college readiness. The report presented here provides a deep description of the program features and the student and teacher perceptions of VE. It also discusses the relative effectiveness of various aspects of the program, such as technology use, project-based learning, and outside-the-classroom activities. The final section of this report offers recommendations to enhance the effectiveness of the New York City VE program.

Overview of the Virtual Enterprises Program

In 1994, a group of New York City high school superintendents, hosted by the Austrian Ministry of Education, visited ten secondary schools in Vienna to observe their virtual firms and see if they could implement a similar model in New York City schools. The use of simulated business firms (or "practice firms") as an instructional tool is a well-established model in Europe. EUROPEN, a non-profit organization that oversees an international network of practice firms, supports 5,000 practice firms in 42 countries. Austria has over 1,000 practice firms, and it is compulsory for students in its Commercial Schools and Colleges of Business Administration to participate in a practice firm.

Based on their experiences in Austria, the superintendents decided to launch the first simulated business firms in the United States. In 1996, the New York City Department of Education implemented the Virtual Enterprises program in seven high schools. By 2006-2007, the program had grown to 68 VE firms in 53 New York City schools. The VE network had also expanded to include over 450 secondary and postsecondary institutions across the country.

In New York City, the VE Central Office is part of the Department of Education. With only five staff members, VE Central provides a broad range of support services to the program: professional development for the teachers (called coordinators); technical assistance that includes trouble-shooting for the firms' web page and email accounts; the operation of an online banking system and marketplace, which students use for selling and buying products; curriculum development; coordination of regular events such as the Business Plan Competition, the International Trade Fair, and the Advertising Futures competition; screening and placement of students into school-year and summer internships and oversight of those internships; collaboration with local colleges that provide college course opportunities to VE students and the monitoring of students in college classes; and workshops on business topics for students.

VE staff also continually assess the program's effectiveness through multiple means: regular site visits to programs; an assessment test consisting of multiple choice questions and a written essay, administered to all VE students at the beginning and end of the school year, which measures students' knowledge of business awareness, technology, business communication, financial literacy, and problem solving; and analysis of additional data such as student attendance. Lastly, VE Central provides training and materials for programs in other states.

The Virtual Enterprises program includes several educational practices that have been shown to benefit students' academic and career preparation. Over the last 20 years, a number of education reformers have argued that integrating work and other experiences outside of school with classroom learning can help engage students in their studies and prepare them for postsecondary education or employment. Research studies have indeed shown that students develop job-readiness and workplace skills through these learning

experiences.[1] Work-based learning can also help young people make the transition from youth to adulthood. By participating in positive interactions with adults, students acquire a matured sense of self and identify paths to adult responsibility.[2]

Work-based learning plays a central role in the VE program; in fact, the VE firm itself is a simulation of the workplace. VE firms attempt to replicate real businesses in both structure and practice. To give students the experience of working in a firm, the classroom is set up like an office, partitioned into departments with computer workstations for each student. The firms are typically divided into five departments: Administration, Accounting, Sales/Marketing, Design, and Human Resources. A CEO is selected by the class, and each department is overseen by a vice president. Departmental tasks include establishing payroll procedures, creating a business plan, designing a sales catalogue, paying rent and electricity, conducting an employee evaluation, sending invoices, and purchasing items from other virtual firms.

Virtual Enterprises uses a student-centered approach to learning that emphasizes project-based, cooperative learning. Students work in teams to make decisions about how to run their corporation. For example, they must decide for themselves which products to market and how to create a successful business plan. There is wide consensus that these pedagogical strategies improve the engagement and learning of students.[3]

Study Methods

Selection of the Programs

In 2006-2007, there were 68 VE firms operating in 53 New York City high schools. IEE researchers limited the study sample to ten of these high schools, selecting two per borough (the Bronx, Brooklyn, Manhattan, Queens, and Staten Island). Since some of the sample high schools had two VE firms, there were a total of 16 firms in our study. VE Central assisted in the selection process by recommending programs that it considered to be well implemented and willing to participate in a study. While most of the firms selected had been in existence for five to ten years, two were only in their second year of operation.

The high schools in our sample were all comprehensive schools. The majority of them were urban and large, with 2,000 to 4,000 students. A few had been or were in the process of being broken down into smaller learning communities with career themes. With the exception of one high school that had a slight majority of White students, the schools enrolled predominantly Hispanic and Black students. Four of the schools enrolled about a quarter Asian/Pacific Islander students. While the programs selected reflect geographic and racial and ethnic diversity, they are not necessarily representative of VE

[1] For studies on work-based learning, see Hamilton (1990), Hughes, Bailey, & Mechur (2001), Jobs for the Future (1994), and Stasz & Kaganoff (1997).
[2] See Bailey, Hughes, & Moore (2004), Hamilton & Hamilton (1997), and Orr (1996).
[3] See Balfanz, Jordan, & McPartland (2002), Castellano, Stringfield, & Stone (2003), Kaufman, Bradby, & Teitelbaum (2000), and Useem, Neild, & Morrison (2001).

programs since they were selected because they are better established programs. Thus, the results from this study cannot be generalized to all VE programs.

Data Collection

We collected data in fall 2006 and spring 2007, using a mixed methods approach that combined qualitative and survey methods. To evaluate the program structure and curricula, we observed the 16 VE classes in our sample and interviewed the coordinators. Interviews were semi-structured, covering topics such as professional development, benefits to the teacher, recruitment methods, and college and career preparation activities. In addition to these classroom visits, we observed VE student workshops, events and competitions, and staff professional development meetings. We conducted interviews with the staff of VE Central to understand the administrative aspect of the program.

To examine student perceptions of the program, we administered an end-of-the-year student survey consisting of questions designed in collaboration with VE Central. The survey's 52 questions covered topics such as participation in VE, college and career preparation, and future plans. The survey was created through Zoomerang, an online surveying tool, and posted on the VE website in June 2007. VE coordinators were given the password to access the survey, and asked to direct their students to complete the survey. A total of 215 surveys from 16 VE firms were completed.

Data Analysis

Data from the observations and interviews were used to develop the survey questions. They also provided a context for the survey findings. These qualitative data were also used to explore the consistency of the program across the ten schools; we did not find vastly different program implementation.

To analyze the survey data, six outcome measures were created by taking the average of a participant's responses to sets of related questions. Grouping together responses to multiple questions is considered to be a better way to measure a concept than looking at a response to only one question. The six outcome measures were the following:

(1) The overall influence of VE.
(2) VE's help in developing job skills.
(3) VE's influence on learning.
(4) The influence of a VE teacher.
(5) VE's help in preparing for college.
(6) VE's help in preparing for a career.

A series of statistical models were run, with each of the six outcome measures as a dependent variable, controlling for the gender, age, race/ethnicity, GPA, and pre-program motivation/interest of the student. Pre-program motivation/interest was found to be statistically significant for every outcome except college preparation. This result can be explained on the basis of self-selection bias; that is, the underlying factors that led to the student's pre-motivation contributed to the positive views about the benefits of

participating in VE. This result might also be explained by a self-confirmation or self-fulfilling prophecy effect. In the end-of-the-year survey, students who reported feeling motivated about the program before it began may have done so because they had a positive experience in the program. Students may have reasoned, "I liked the program and it helped me so much, I must have been motivated about it in the first place."

Neither race/ethnicity nor gender were found to be statistically significant in any of the models. Thus, while students may have entered the VE program with characteristics which might have made them more successful (e.g., higher motivation), their outcomes were not affected by their race/ethnicity or gender. This is an encouraging finding, given the disparities found in the academic performance of different racial/ethnic groups. It is also encouraging that females reported the same outcomes as males in the VE program, given that many career and technical education fields continue to be dominated by males.

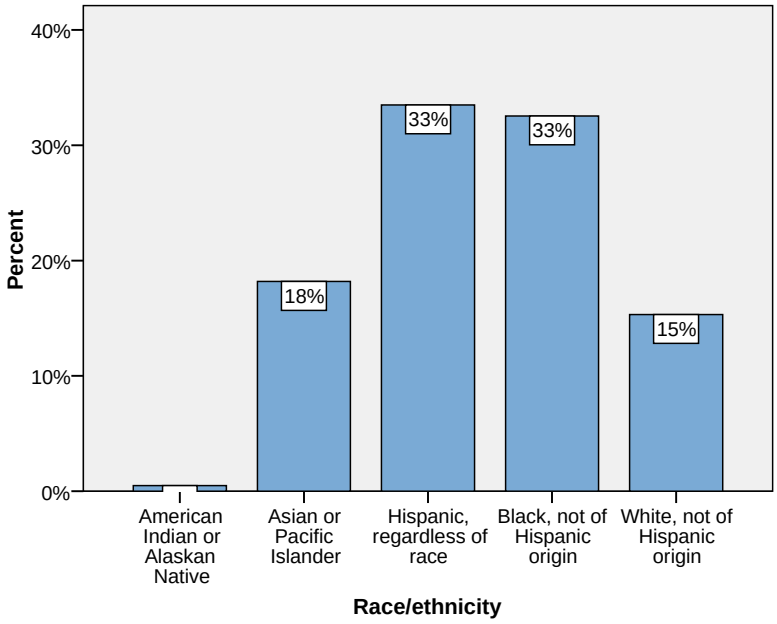
The Program Students

Who are Virtual Enterprises students? Of the 215 students who completed our survey, respondents were divided evenly between males and females, with the majority of students from underrepresented groups: 33 percent Hispanic, 33 percent Black, 18 percent Asian or Pacific Islander, and 15 percent White (Figure 1). Most of the students were seniors (83 percent), followed by juniors (16 percent). Only two students were sophomores. Forty-seven percent of the students were 17-years-old; 36 percent were 18-years-old. A quarter of the students reported their overall GPA between 3.5-4.0, 35 percent between 3.0-3.49, 30 percent between 2.5-2.99, and 9 percent below 2.5.[4] Thirteen percent of the students had previously been English Language Learners (ELL). Three students were Special Education students. Almost half the students reported that the highest level of education attained by their mother was high school graduation or less. Twelve percent of students' mothers had an associate degree, 15 percent had a bachelor's degree, and 8 percent had an advanced degree.[5] Almost half the students surveyed indicated that the main reason they applied to VE was an interest in business.

[4] In past studies, we have found that students often do not report their GPAs accurately because they do not know them. Therefore, these numbers may not be accurate.

[5] We focus on the level of mother's education since 28 percent of students surveyed did not know their father's level of education. It is likely that many of these students come from single-parent families. Of the students who did report their father's education, levels were similar to those of the mother's.

Figure 1



According to our data, an average VE student is a 17-year-old Hispanic or Black high school senior with a B average, an interest in business, and a mother and father who graduated from high school but had no further education. The students in VE are not necessarily representative of the students in their schools since they are not randomly assigned to the program. To get a better picture of the students who participate in VE, it is important to understand the recruitment and selection process. Almost all the VE coordinators highlighted the importance of the selection process, emphasizing that a successful VE class needs to have students with a mix of skills and qualities. "You have to have a group that gels and can work together," said one coordinator.

Unlike a regular high school course in which most students are placed by their guidance counselors, VE uses a variety of recruitment methods to attract students who might be a good fit for the program. The VE coordinators visit classrooms to promote the program, distribute "job applications," ask teachers for recommendations, and have students come in dressed in business attire for "job interviews" with the current Human Resources Department. Some programs even send students "hiring letters" to welcome them to the class.

The VE programs vary in whether they set formal eligibility criteria for entering students. Two of the schools in our sample set a minimum GPA of 75, and another school sets a minimum GPA of 80, which helps to explain the relatively high overall GPAs of our respondents. One coordinator said that he aims for students with GPAs in the upper 70s, but said that "I'm less concerned with grades and more with interest." One program also requires students to take either a college business course or an Advanced Placement (AP) course while they are enrolled in VE. A few schools allow only seniors in the course,

although most programs enroll a few juniors so that there will be some continuity into the next year.

In terms of skill sets, the coordinators look for students with computer and writing skills. Since VE students frequently use computer programs and the Internet to complete their tasks, VE Central recommends that students take at least one computer course prior to participating in the program. However, many students do not have the appropriate business and technology preparation for VE. Indeed, 14 percent of the students surveyed had taken no computer courses prior to the VE course. In a few schools, however, VE is the capstone course of a Career and Technical Education (CTE) sequence that typically includes a computer course. For example, students in the Entrepreneurship sequence take Computer Applications their sophomore year, Entrepreneurship/Travel their junior year, and VE in their senior year. Thirty-eight percent of the students surveyed indicated that they were taking VE as part of a CTE sequence. Such a progression makes recruitment easier, and presumably, students who already have been in a program together will "gel" better in VE.

In addition to the official selection criteria, VE coordinators also look for certain qualities in prospective students, including motivation and maturity. One coordinator explained that the program requires a lot of work and can be stressful with its deadlines and competitions, so students need to be motivated. "Students don't need to be straight-A students, but they need to have a passion and want to work hard. They also need to have good attendance," said one coordinator. "It's a course for a student who is more mature, and I hope it stays that way," said another coordinator. Since the students are not always monitored or directed by the teacher, they need to be able to work independently.

With all these qualifications, it may seem like VE only serves highly-motivated, high-achieving students. However, in reality, many of the coordinators find it difficult to recruit enough students for the 25 slots recommended by the VE Central Office. Some schools have divided into smaller learning communities, and only allow VE to recruit from the Business/Technology communities. The VE course is a double period, which makes it more difficult to schedule, especially for students who take double-period AP courses or still have graduation requirements to fulfill. More than a quarter of the students surveyed indicated that it was hard to fit VE into their course schedule. Newer programs also face the challenge of not being well known in the school. Given these obstacles to recruitment, the class often ends up with a mix of students, including those who are motivated, those who are recommended by a teacher, and those who are placed in the course by a guidance counselor.

Ideally, this mix of students would help encourage those who need some extra motivation in their senior year. One coordinator said that her VE class has both a resource room student and the valedictorian. She pairs stronger and weaker students so they can help each other. However, since the program requires a large amount of teamwork, some students expressed frustrations with working with unmotivated students. Sixty percent of the students surveyed indicated that some students in VE did not work hard. Several students indicated that their least favorite part of VE was other students' lack of

commitment. Thus, the program faces a tradeoff in its selection process – coordinators want to choose students who are self-motivated and enthusiastic about the program, but this inclination may leave out disengaged students who might benefit from and become motivated by a more applied, student-centered environment in their senior year.

Teachers and Teaching Strategies

Student-centered learning is at the core of the VE program. Instead of using a traditional lecture format, VE promotes student-directed, project-based learning. On a typical day, students design brochures in Photoshop, calculate their taxes in Excel, hold an executive meeting, or buy (virtual) gift baskets over the Internet. They work independently or in small groups and have discretion over how to accomplish their different tasks. For many students, having authority over their learning is a new experience that can be both exciting and nerve-wracking. "It's us, just running everything. We're so used to having the teacher telling us what to do," said one student. "We get to make our own decisions," said another student. "We have more control." While students enjoy this new freedom, they also find it challenging to assume responsibility. "They're used to the teacher [and] blackboard," said one coordinator. "They depend more on me than they should. I try to step back, [be the] last person they see."

VE teachers play an important role in facilitating a student-centered learning environment. VE teachers are called "coordinators" because their job is to oversee and guide student learning. The VE curriculum describes the teacher's role as changing from "sage on the stage" to "guide on the side." This transition can be difficult for teachers, especially for those who come from traditional teaching environments. One coordinator said that she felt "fortunate not to have 20 years experience teaching" because she would want to have more control in the classroom.

In order to support the teachers, VE Central has posted the VE curriculum online and provides the coordinators with continual professional development. In the summer, VE Central organizes a week-long orientation for new coordinators to provide an overview of the program and explain the coordinator's role (see Vignette 1). While most coordinators feel overwhelmed in the beginning, they find support from VE Central and seasoned VE coordinators. In addition, the New York City coordinators are invited to meet with the VE Central staff on a monthly basis to discuss concerns, refresh their knowledge of a selected topic, and learn more about upcoming VE projects and events.

Vignette 1
Virtual Enterprises New Coordinators Workshop

The New Coordinators Workshop was held in a room with computer work stations at Baruch College in Manhattan. There were approximately 15 attendees, not including VE staff, with several coordinators from Washington, DC, Pennsylvania, Maryland, and New Jersey, as well as New York City. Because of its expertise, the New York VE office is paid to conduct professional development for new VE firms across the country.

The facilitator began the session as though she were facilitating a new VE class in its first week. The group must decide what kind of VE to have and what products to sell. There was discussion of the "target market." Some of the participants asked questions that indicated they were only just beginning to understand the program: "Is there a real store?" Reply: "No, the only face-to-face contact with customers is at the annual International Trade Fair." Another question: "What is the motivation for other VEs to purchase VE products?" Reply: "All VEs have to make a certain amount of purchases – they're graded on selling and buying." All VE firms have an online bank account, which they use to buy products and services from other VEs. The VE bank also provides start-up capital for new firms.

The facilitator continued. VEs have a double class period, so usually the team meets for one period, and then the students separate to do individual or group work. After the team decides on the product, subgroups will need to write a product description, research the competition, take pictures of products to create a catalogue, and develop a website. HR and Accounting subgroups have other tasks to do. It's the coordinator's job to identify the skills and interests of the different students – Who likes accounting and who knows Excel? Who knows about web design? Either the coordinator or the previous year's employees (class) prepare job descriptions and an employee manual. The coordinator should ask the students, What is a marketing job? What is an accounting job?

Throughout the day, participants began to ask, "Isn't this pretty advanced for the students?" Another asked, "Doesn't this assume some understanding of accounting?" A teacher asked, "Would it be wrong for the teacher to give the students all the numbers they need at the beginning?" The facilitator answered, "You can be sure that your involvement will be stronger at the beginning than at the end of the program."

During our site visits to VE classes, we observed a range of teaching styles and roles. Some coordinators took a more directive role, leading student meetings and voicing their opinion on how tasks should be completed. Other coordinators acted more as managers, checking in with students to make sure they were on task. Still other coordinators acted as resources, rotating around to offer assistance to small groups of students. At times, such as when students are preparing for the Business Plan Competition, teachers take the role of coach. In addition, teachers are counselors to the students in that they encourage them to sign up for VE career preparation workshops and college courses.

When the coordinator had a less visible role in the classroom, the students had more opportunities to develop leadership and problem-solving skills. However, a student-directed classroom is also more difficult to monitor. Many of the coordinators mentioned that it was sometimes difficult to keep the students on task because everyone was doing different things. Some successful strategies used by teachers to keep students on task

include requiring students to write weekly logs that list their tasks and accomplishments, using the vice presidents to monitor and evaluate students in their departments, and assigning additional tasks so students stay focused.

The coordinators whom we interviewed described many benefits from teaching in VE. Several said that VE gave them the opportunity to work with students on a more personal level than teaching regular courses allows. One coordinator said, "You get to work with the kids in a different way. As opposed to being teacher-centered, it's student-centered. And I get to know and understand the student personally." Another coordinator echoed these sentiments: "I like it better than the classroom because it can offer the kids so much more. It's not 'do this.'" Since the students work independently, the coordinators have time to talk with individual students and try to work through their difficulties. One student expressed this difference: "I feel more like an adult. In other classes, teachers talk down to us."

This personalization is evident in the survey findings: 73 percent of the students who responded to the question said that their VE teacher took the time to get to know them (Figure 2), and 66 percent said their teacher helped them to develop their skills and interests (Figure 3).

Figure 2

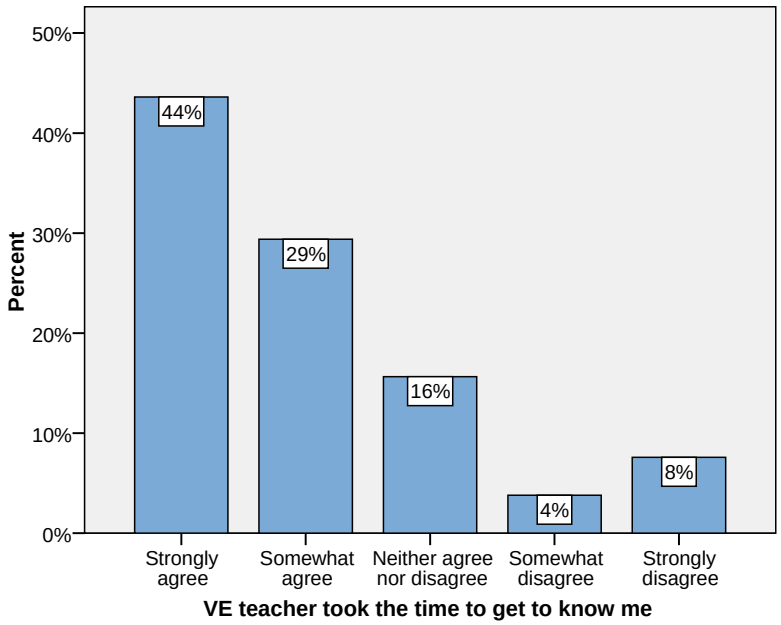
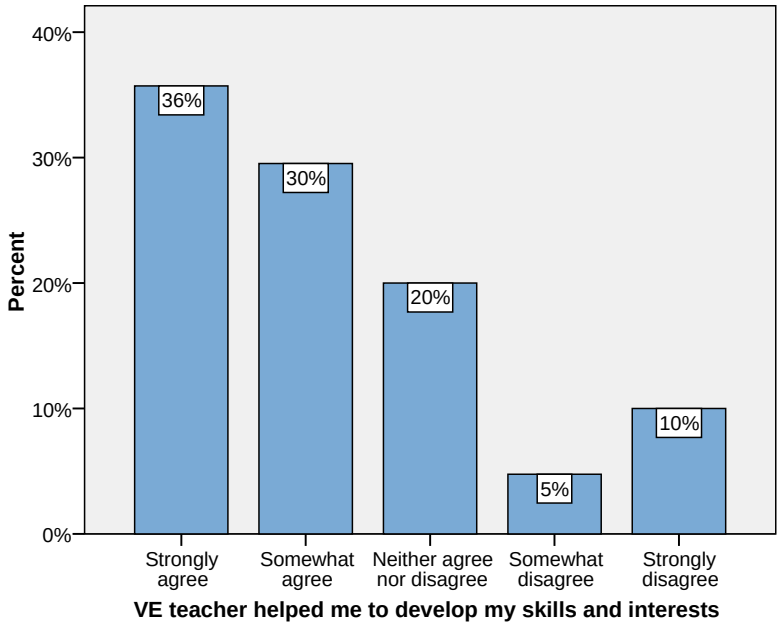


Figure 3

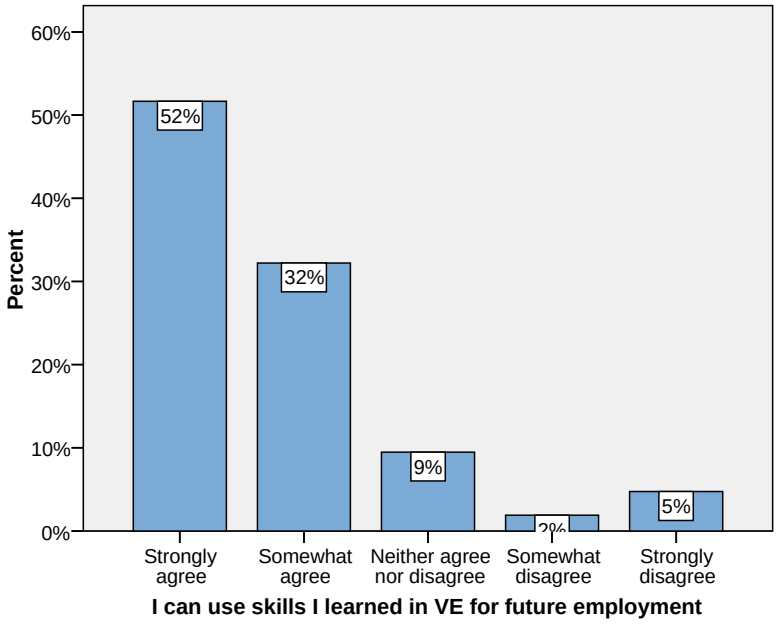


The program challenges the teachers as well as the students. As one teacher said, “It forces me to always be on top of my game, so I force them to be on top of their game.” Another coordinator said that he appreciates the flexibility of the program: “The ability to be creative, it keeps you fresh.” The teachers believe the students are gaining something particularly valuable from the program, and that gratifies them: “They’ll be far more ready, far more capable at the end, and that gives me a personal sense of satisfaction.”

Career Preparation

Our survey results indicate that VE had a largely positive influence on students’ career preparation. Students acquired a variety of workplace skills, including office skills, computer skills, problem-solving skills, and interpersonal skills. The vast majority (84 percent) of survey respondents indicated that they could use the skills learned in VE for future employment (Figure 4). These responses suggest that VE is indeed providing students with an education that seems relevant to their future and is helping them make the connections between school and work. In addition, VE provides student with a range of opportunities outside of the classroom to connect with other virtual firms and real businesses.

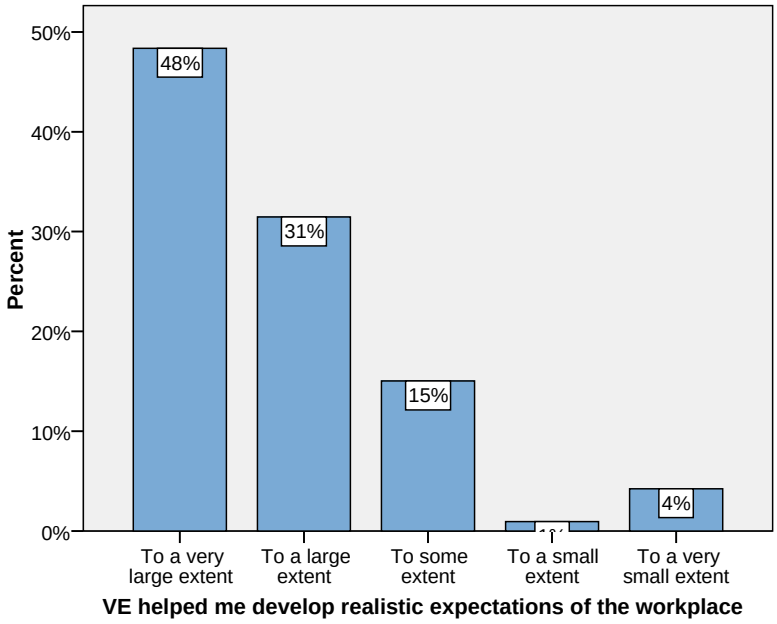
Figure 4



Development of Workplace Skills

During our site visits, students often described their experiences in VE with comments like "We are at work" and "This is a job." Seventy-nine percent of the students indicated that VE helped them develop realistic expectations of the workplace (Figure 5). As a hands-on learning program, VE is structured so that students think of themselves as employees who are working in a business firm. Each firm develops and markets a line of virtual products and services, like cell phones and gift baskets or printing and web design. Students work in different departments, working on product design and marketing or keeping payroll and calculating firm revenue. "I think I'm so passionate [about my work] because this is what I want to do in the future," said one vice president of Sales and Marketing. "It feels like a real job. You check your pay, your W-2. It's a real world experience. It's a privilege," said a student in Human Resources.

Figure 5



Through their work in the firm, students learn various workplace skills: how to answer phone calls, write checks, prepare invoices, write memos, send faxes, and write an agenda. Periodic workshops run by VE Central teach a limited number of students more specialized tasks like how to fill out tax forms, write a business plan, and create a budget.

VE students use computer applications for most of their work, becoming proficient in programs like Microsoft Word, Excel, PowerPoint, Illustrator, and Publisher. During our visit to a VE travel magazine, we observed three students in the Sales and Marketing Department working on the firm's website. One student was using html to create boxes for advertisements, another was writing a travel article in Microsoft Word, and the third was adding flash to the website and creating links using Microsoft Illustrator. VE students also have email accounts and use the Internet to research products and find images for their catalogues and advertisements. In addition, the VE marketplace and banking systems are both online.

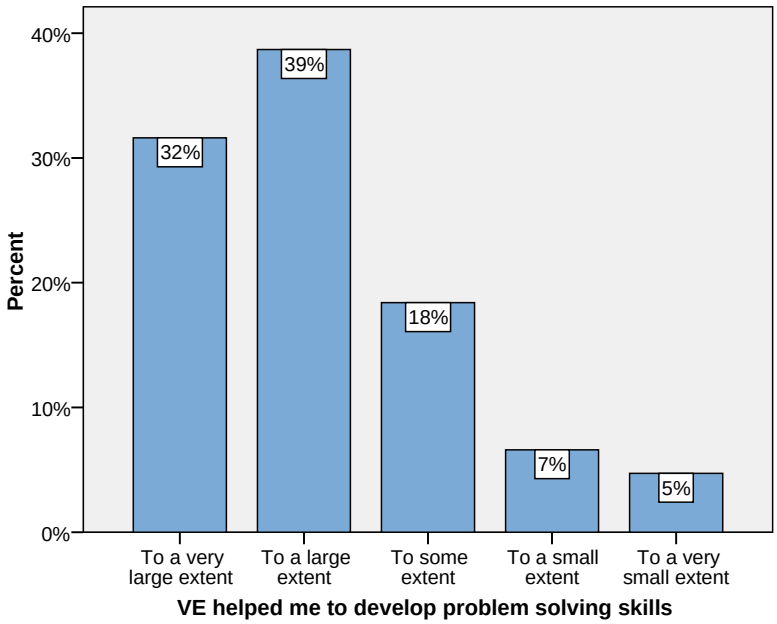
The majority of VE students had taken at least one computer course prior to VE, and several students said that VE gave them an opportunity to apply their computer skills. Students who had not previously learned how to use computer programs "learn on the job." On one of our visits, a student proudly showed us her PowerPoint presentation to recruit next year's students. Her classmates had showed her how to use PowerPoint. "You learn lots of computer skills here," she said. Being adept with computers is a skill that is valued in almost any job. The VE internship coordinator told us that many employers ask for student interns with excellent computer skills.

Another important skill that VE fosters is critical thinking. Instead of being recipients of information, students must take an active role in their firm and make decisions that will

benefit the business. Almost three-quarters of them indicated that VE helped them develop problem-solving skills (Figure 6). One student wrote:

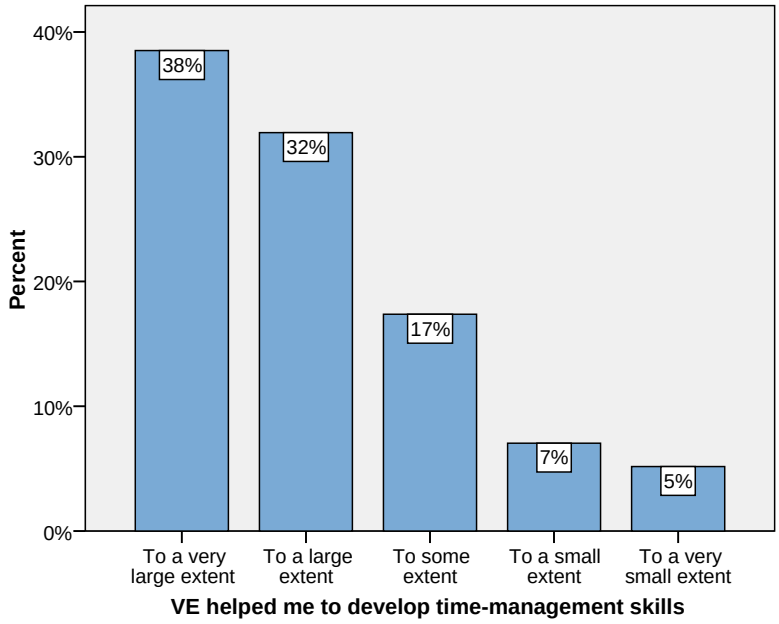
> Instead of a regular class [where] the teachers teach on the board, students take notes and do homework, we…learn from actual working. We learned from mistake[s]. In the process, I learned in a way that allows me to improve my ability to handle information, to make decisions, to work in groups and independently, to set up objectives, to time manage and to evaluate.

Figure 6



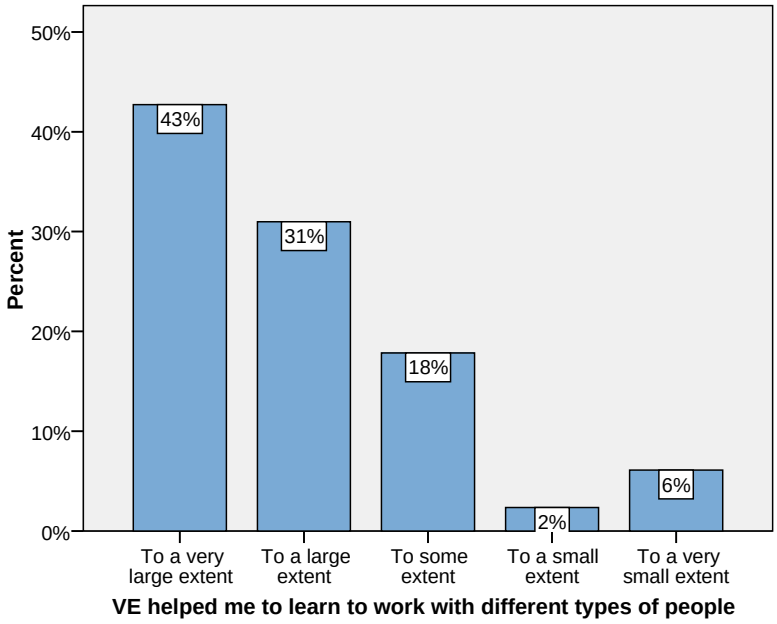
Seventy percent of students indicated that VE helped them develop time-management skills (Figure 7). One CEO had an intern help her improve her time-management skills by telling her when every ten minutes passed.

Figure 7



In a typical high school class, students have few opportunities to work on their interpersonal skills and teamwork. However, in VE, working in teams is critical to the success of a firm. Seventy-four percent of the students indicated that VE helped them learn to work with different types of people (Figure 8). “It’s unlike any other class [where] you can be absent for three days and no one else is affected,” said one student. In VE, students need information from other students in order to do their work. If students are absent, they sometimes email their work to the others and say, “I’m working from home.” There is a high level of interdependence, and students recognize that they must cooperate in order to accomplish their goals. One student said that he had never worked as efficiently with a group before participating in VE.

Figure 8



Still, it can be difficult for students to work together. According to one VE coordinator, it is very difficult for her students to listen and take criticism, and to show respect to their peers when they do not like them. “Telling strangers what needs to be done can be awkward,” wrote one student. However, it was worth the effort for him. “My favorite VE experiences include sitting down with the employees and teaching them how to produce work efficiently. Watching others produce work due to the lessons I have given feels great.” In many VE firms, the Human Resources Department conducts employee evaluations and conflict resolution workshops to help work out interpersonal conflicts. Still, we heard several complaints from students that their classmates were not doing their work, placing additional burdens on them and lowering the morale of the group.

Bringing Students into the Real World

While VE promotes teamwork, competition also plays a significant role in the program. Throughout the year, VE sponsors a number of high profile local and national competitions that involve judges from the business world, award ceremonies, and trophies. In the eyes of supporters, competitions motivate students to work hard and strive to do their best. “Competition really brings out the best in them,” one coordinator said. His students are motivated to learn so they can perform better in the competitions. He calls this “trick teaching.” To detractors, competitions can be stressful and overwhelming, placing too much pressure on students and teachers. One coordinator pointed out that students are the best promoters of the program: if they feel too stressed, they will not encourage their friends to join the program.

Competitions certainly are time consuming and sometimes stressful, but they also energize the students and provide recognition for their work and for the program. Local

businesses sponsor and participate in the competitions, giving students opportunities to meet people in fields that interest them. Seventy-two percent of the students indicated that VE helped them feel comfortable working with adults (Figure 9), and 81 percent indicated that VE helped them know how to behave in professional situations (Figure 10).

Figure 9

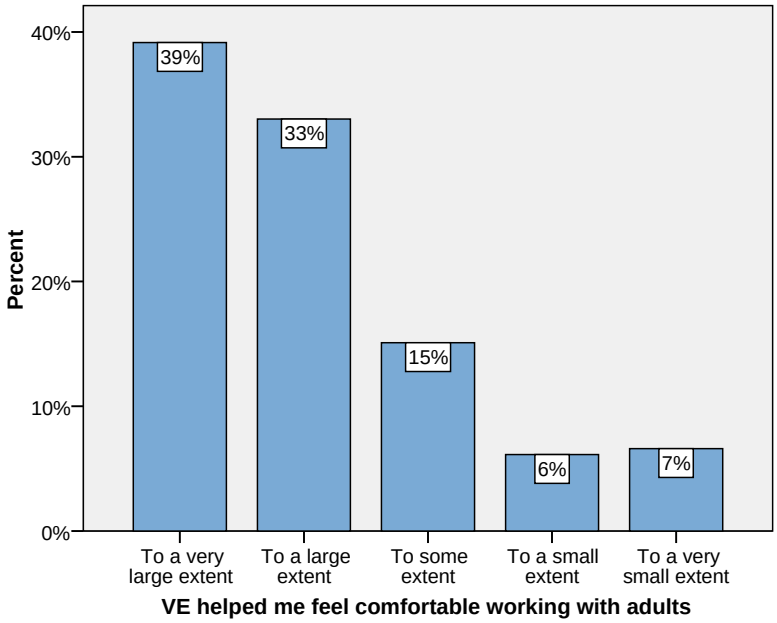
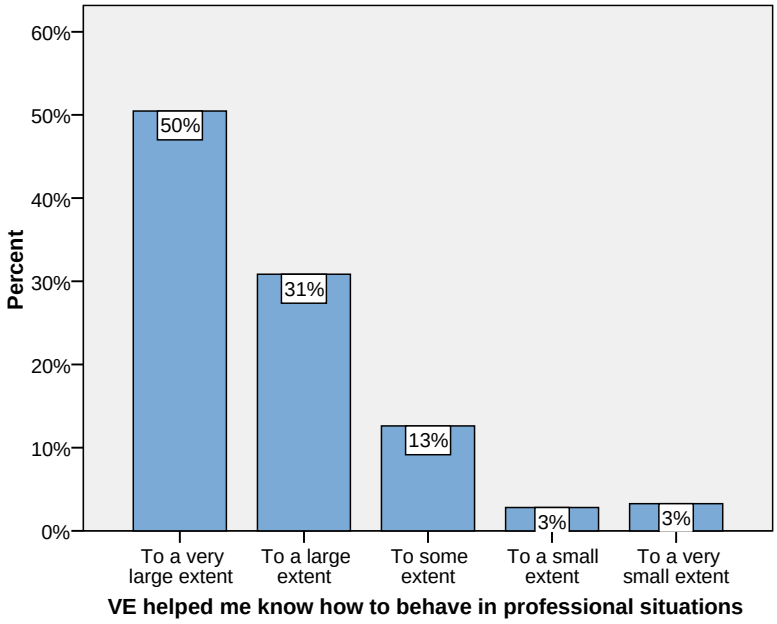


Figure 10



Moreover, competitions teach students about the nature of the business world. As one student aptly put it, “Most importantly, I have learned about what it takes for a business to compete in the real world.” VE also teaches students how they can succeed in the business world. One student described how he changed during his year in VE from a “mere, quiet boy that was the one that would stand in the corner” to someone who is “promoting myself every chance I get. [VE] instilled with me perseverance, competitiveness, and drive.”

The competitions also give students the opportunity to speak in front of a large audience. In presenting at the Business Plan Competition (Vignette 2), one student wrote:

> I had never spoken in front of an audience before. My heart was pounding extremely fast and I started to perspire, but I took a deep breath and with confidence I just did what I had practiced all week. Taking part [in] this experience, I overcame my obstacle of being shy. Now I feel more prepared and more self-assured in my ability to speak publicly.

Another student wrote, “Before Virtual Enterprise, I was reticent to speak in front of other people, but my Virtual Enterprise firm … has shaped me into a future businessman.”

Vignette 2
Virtual Enterprises Citywide Business Competition

The Citywide Business Plan Competition takes place at the offices of Deloitte & Touche at the World Financial Center. There have been prior competitions in each of the boroughs to determine the fourteen VE firms that will make it to the final round. These teams wait anxiously for their turn to present. The room is full with students, teachers, and principals. In the front row sits a panel of judges made up of employees from different business firms. A representative from Bear Stearns welcomes the students: "You are tomorrow's leaders. You warrant your place in the business world." A representative from Deloitte & Touche tells the students that 60 Deloitte professional staff have worked with four VE firms, and 14 VE alumni currently work at the firm.

Each firm has eight to twelve minutes to present its business plan to " potential investors" (the panel of judges), followed by three minutes of Q&A. The first team of students is smartly dressed with the men in business suits and the women in blue collared shirts with black vests. They comprise the management team of a virtual hotel/resort in Cancun. Each student speaks loudly and clearly, and the team's PowerPoint presentation is full of Excel charts and special effects. As one student explains their marketing strategy – which includes a MySpace page – we are reminded that these are high school students. Watching the students present with such professionalism, it is easy to forget.

During the Q&A time, the students are asked, "What current event since September 2006 has most affected your firm?" Without hesitation, a student explains how the new law requiring travelers to Mexico to have passports may have a negative impact on their business. To assist travelers with obtaining passports, they have added a link on their website to American Express passports. The second question follows: "What expense would you drop if you had to cut costs?" A student replies, "We will reduce staffing for the off-peak season."

The largest event sponsored by VE Central is the International Trade Fair, and it is the highlight of the year for most students. While only select students participate in some of the other events, the whole class usually attends the Trade Fair. It brings together firms from across the country and even a few firms from outside the United States to buy and sell products. Each firm designs a booth to advertise its products and services, and tries to attract customers. Students wander around the Fair, making sales and meeting students from other firms with whom they have previously had only virtual exchange. Guests are also invited to participate; they receive "checks" that they can use to purchase products. The Fair is loud and busy, and feels like a real business convention. One student described the Trade Fair as "the most chaotic, tiring, craziest experience I ever had and I would not mind to do that all over again." Another student, who initially thought that the Trade Fair would be boring, commented, "You do business with so many people. You get to see a face." Yet another student echoed the sentiment, "Even though the program is virtual, the trade fair brings a unique sense of reality."

To help students translate the skills learned in their virtual workplace to a job in the real marketplace, VE Central offers a Job Readiness Training for interested VE students that provides tips on writing resumes, preparing for interviews, and finding a job. The training is offered twice a year. Even though the workshops occur on a Saturday, students

participate in large numbers. Forty percent of the students surveyed attended the Job Readiness Training. The training is required for any student who seeks an internship through the VE program. Internships, which take place during the school year and summer, are arranged through VE Central. About one-fifth of the VE students surveyed participated in a VE internship (see the Appendix for a list of businesses that offer VE internships).

All these activities provide VE students with more opportunities to learn about careers and prepare for their futures. As one coordinator said, "It gives them a foot forward; they have advantages that other students not in the program wouldn't."

Academic Skills and College Preparation

Supporters of Career and Technical Education (CTE) argue that it brings relevance to the high school curriculum and helps students engage deeply in their studies. Detractors, conversely, argue that minority and low-income students are sometimes steered into CTE tracks that do not lead to college. Research provides support for both these arguments. While CTE has been shown to motivate students and support high school attendance and graduation, it has not been found to have a significant impact on students' academic achievement or college-going rates.[6] To address these concerns, many educators and policymakers have advocated for increasing academic rigor in CTE courses and programs.

By combining a rigorous curriculum with a hands-on application of many academic skills, Virtual Enterprises aims to prepare students for both college and careers. The VE curriculum includes a strong academic component, focused on writing, speaking, math, and technology skills. For example, we observed students engaged in many different forms of writing, including human resources manuals, new employee manuals, business newsletters, business plans, annual reports, emails to customers and potential customers, memos, meeting agendas, employee evaluations, student recruitment flyers, questions for student interviews, resumes, and cover letters. In most cases, students must write several drafts of these documents before they are finalized, a process that teaches the importance of revising one's work to ensure the accuracy of punctuation and content. Students must also learn proper speaking skills, as they talk with clients and employer partners, and the subgroup of students that participates in the Business Plan Competition must perfect a formal oral presentation (see Vignette 3).

[6] See Kazis (2005) for a review of research on CTE.

Vignette 3
Preparing for the Business Plan Competition

In an insurance company, five students and the coordinator met to discuss the upcoming Business Plan Competition. The students had to prepare a seven-minute speech and a PowerPoint presentation for the competition. The following day, they were presenting for the principal as a practice session. One student timed the presentation and clicked the slides forward. The other four began to practice. The CEO had memorized parts of her speech and spoke in a loud, clear voice. All the students seemed professional and knew their material well. They discussed when to switch the slides and seemed in sync with each other. Students were supportive of one another as each one spoke. The CEO suggested that they conclude their speech by saying their company name: "It's cheesy, cute, and catchy." Plus, it would help people to remember their company name (an important lesson in marketing). The CFO suggested they could end with the CEO saying, "Remember: We are…" with the group saying the firm's name together.

The learning of mathematics and technology skills frequently goes together. Students in the accounting department must master details about students' pay and business and individual taxes, as well as process invoices. We observed many students engaged in calculations, such as checking data for the company's tax forms. Selected students from different firms attend a specialized workshop on W-2 reports to the Internal Revenue Service, taught by VE Central staff members (see Vignette 4).

Vignette 4
Virtual Enterprises W-2 Workshop

About 15 students attended the W-2 workshop. The facilitator began to talk about Excel spreadsheets, saying that if he started to go too fast anyone who didn't have enough experience with Excel should just ask questions. He asked the students to say which departments they were from, and learned that most were from Accounting with a few from Human Resources. After the students logged in to the computers, the facilitator projected a laptop screen onto a large screen at the front of the room. He started with some general questions: "Who gets to decide how much someone gets paid?" There was discussion about how most of the firms pay by the hour, with HR counting the hours and then reporting that information to the Accounting department, which actually pays the employees.

The IRS requires that, starting January 1st, every firm has to prepare a W-2 for every employee, which has to be completed by January 31st. The facilitator referred to a handout, a withholding tax form 941… There was discussion of payroll taxes and income taxes, and what the government uses taxes for. Then, there was discussion of the difference between earned and unearned income… The facilitator explained federal and state withholding. He then talked about 401K plans. In the VE program, employers are required to match employee contributions dollar for dollar.

The facilitator continued: "Social security has been a hot topic the last couple of years." Many of the students wanted to comment on this…Then, they all referred back at the Excel sheets, looking at deductions, formulas, gross pay versus net pay, and so on. The facilitator told the students that some companies contract out their payroll services, asking, "Does anybody know the term 'outsource'?" Some did. "Anybody read *The World is Flat*?" In the book, the author explains that the people processing your payroll could be in India.

Our survey results show that 58 percent of the students found that what they learned in VE was more challenging than what they learned in their other classes (Figure 11). Setting higher expectations for students and showing them the relevance of their education can be powerful motivating forces. Sixty-eight percent of students indicated that VE motivated them more than their other courses did (Figure 12), and 53 percent of students indicated that VE motivated them to do better in their other classes.

Figure 11

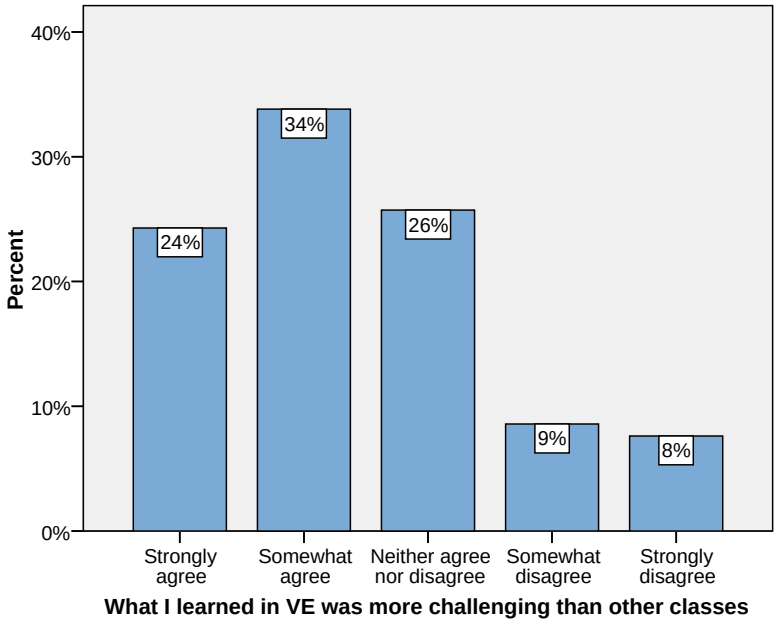
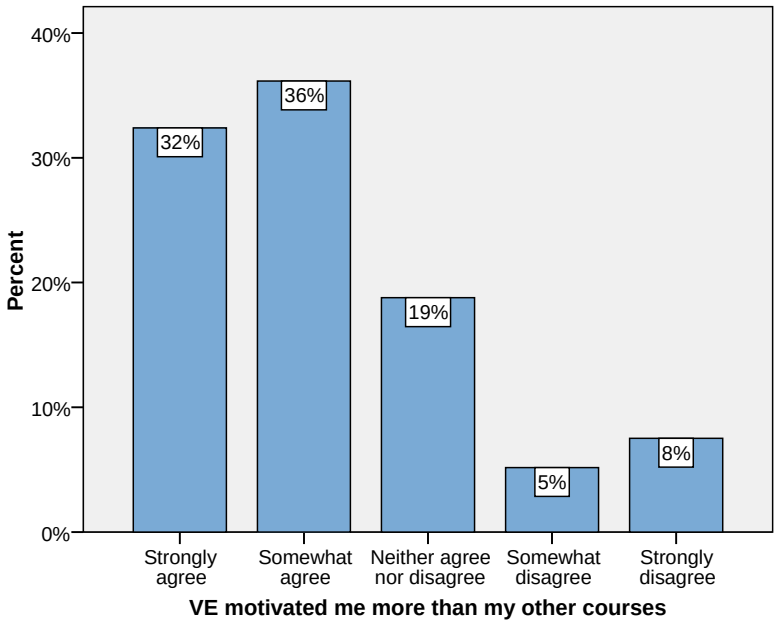


Figure 12



While these are positive findings, it should be noted that the level of academic rigor and student expectations sometimes varied significantly by their position and department within a firm. Students in leadership positions have greater responsibilities and appear to have more opportunities to engage in academically rigorous work. For example, during one of our site visits, the vice presidents of the firm were writing the firm's business plan,

a very challenging task, while employees in the Design Department spent the class searching online for images for the firm's brochure. In our survey, over a quarter of the respondents indicated that they sometimes did not know what they should be working on. It may be necessary, therefore, for coordinators to assign additional projects to ensure that all students are improving their skills so that the students' own level of initiative does not determine how much they gain from the class. For example, one VE coordinator requires all students to summarize business articles found in newspapers and magazines.

As part of some of the VE courses, students study an applied economics curriculum, thereby linking the career technical component with an academic subject required for high school graduation; students receive economics credit upon passing an end-of-course examination. VE Central has created an economics curriculum that integrates economic concepts into the VE curriculum, and would like all VE programs to fulfill the economics requirement. Adding economics to VE seems like a promising way to integrate academics into the program, and also to work with students' scheduling requirements. However, some coordinators felt that there was not enough time to teach economics lessons, as their students were already busy with regular VE coursework and preparations for the different competitions. Typically, the economics curriculum is taught in a traditional format during a portion of the VE class time, although we did speak with one coordinator who tried to create a college atmosphere by giving her students the assigned readings and expecting them to come prepared to class to discuss them once a week. Adapting a college format may be a less time-consuming way to incorporate economics into VE while also providing students with an opportunity to participate in a college-like course experience.

Participating in VE has helped the majority of the students surveyed feel more prepared for college. Sixty-six percent of them indicated that VE improved their confidence about being prepared to do college work (Figure 13), and 63 percent indicated that VE made them believe that college was a realistic option for them. Forty-six percent of the students said that their VE teacher helped them with college planning, a not insignificant percentage given the teachers' workloads and the fact that school guidance counselors generally have this responsibility. Sixty-seven percent of the students surveyed indicated that VE helped them focus on what they wanted to study in college (Figure 14). One student wrote:

> Compared to my other classes, Virtual Enterprise has had the most meaning towards my high school education. The program is very thorough and concise since it is hands-on. I am so excited every weekday to wake up and get dressed in the morning since Virtual Enterprise is my first class. The motivation that I attained to better my future and life is invaluable. I am so much more prepared for college, my future career, and life than my fellow peers since I have had this opportunity.

Figure 13

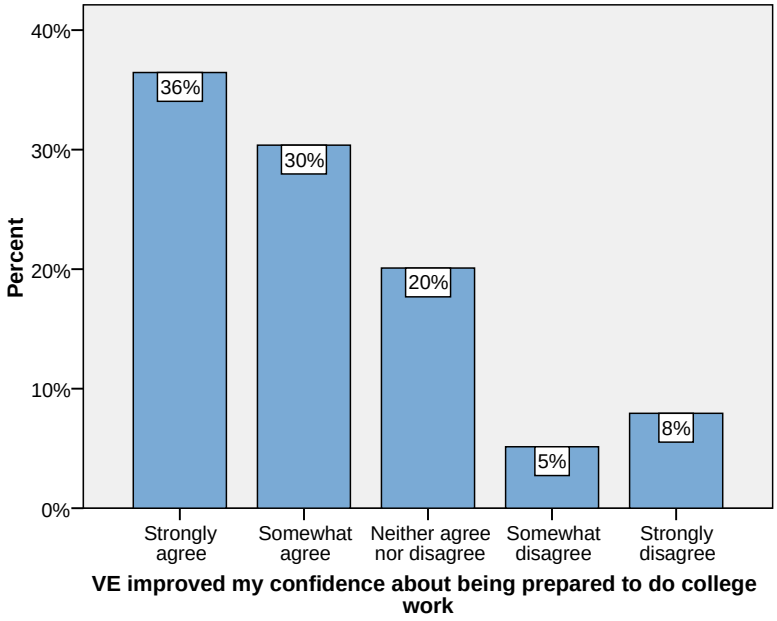
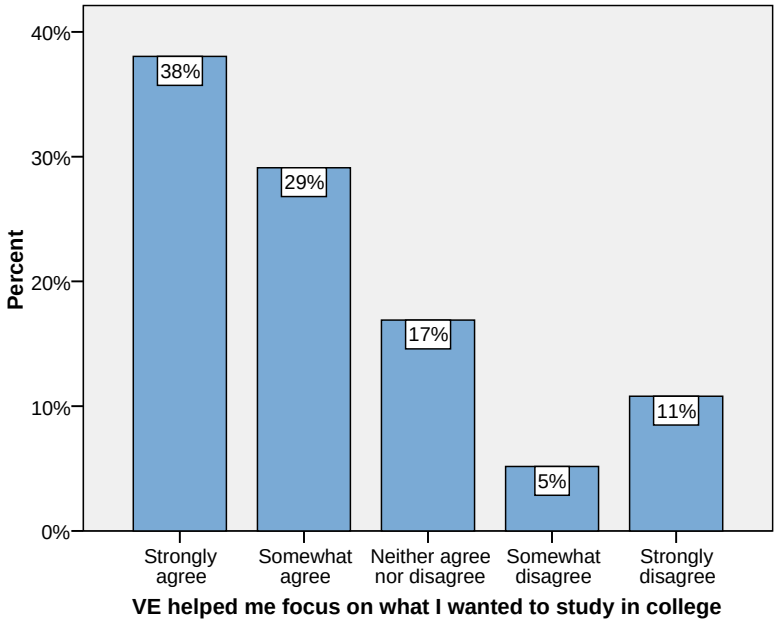


Figure 14



To support their college preparation, VE students have the opportunity to enroll in actual college courses. They may take college-credit courses for no cost at the local partnering colleges: Queensborough Community College, Borough of Manhattan Community College, NYC College of Technology, Monroe College, DeVry Institute of Technology,

and Baruch College. Course offerings include Public Speaking, Introduction to Business, Introduction to Accounting, Introduction to Marketing, and Integrated Business Applications There is some evidence that taking college courses while in high school, called dual enrollment, can improve college access and success.[7] Proponents believe that dual enrollment helps students understand the academic and social expectations of college, and thus gain a broad orientation to college before they leave high school. Indeed, the VE Central coordinator of the college component said, "I want [students] to get a culture of going to college." One-quarter of the students surveyed took a college course through VE, and almost 90 percent of them received an A or B in their courses.

Finally, 91 percent of VE seniors reported that they will go to college in the fall. They will be attending a wide variety of colleges, including those participating in the program, but also Barnard College, Hunter College, Long Island University, Fordham University, Queens College, the State University of New York in Albany, and John Jay College. Eighty-seven percent of the students reported that they will attend college full time, which is significant, as full-time attendance is associated with a greater likelihood of earning a degree.[8] In addition, 47 percent of the survey respondents said they intended to major in business in college.

Conclusions and Recommendations for the NYC Department of Education

Our findings show that the Virtual Enterprises program is teaching students job-readiness and academic skills, which help them to prepare them for both careers and college. Certainly the program's greatest strength is its student-centered, project-based approach: this gives the students, who are all but adults, responsibility, some autonomy, and opportunities for learning experiences outside of the traditional classroom. VE also provides teachers with the flexibility to be creative and the opportunity to work with students on an individual basis. VE is clearly not a typical high school class, and it does require more resources to support its broad program activities. Nevertheless, based on the many positive findings from our study, we recommend that the New York City Department of Education continue to support the VE program and look to expand it to other schools. We also make some specific recommendations about the program.

Include a computer literacy requirement for all New York City students. Proficiency in computer applications is critical to the success of all students, whether they continue on to postsecondary education or to a career. Currently, the NYC Department of Education does not require students (Career and Technical Education [CTE] or non-CTE) to take a computer course for graduation. Students can meet the learning standards in technology "either through a course in technology education or through an integrated course combining technology with mathematics and/or science."[9] Given the importance of technology in the twenty-first century, the NYC Department of Education should ensure

[7] See Lerner & Brand (2006) and Karp, Calcagno, Hughes, Jeong, & Bailey (2007).
[8] See Horn & Carroll (1996).
[9] See NYC Department of Education Career and Technical Education graduation requirements at http://www.nyccte.org/graduation.asp?mid=5.

that all graduating students are computer literate and, ideally, computer skills should be taught as part of an applied, project-based curriculum (as in VE).

Provide more support and staffing for the VE Central Office. At the time of our study, the VE Central Office had only five staff members to oversee 68 VE firms in 53 New York City schools. Even that low staffing level has since decreased. In addition to providing technical assistance to VE firms, the VE Central Office provides the program with a broad range of support services, including professional development, out-of-school activities and workshops, and oversight for internships and college courses. These services, which are supplements to the VE curriculum, are integral to the quality of the program and the students' experiences. The VE staff that we interviewed shared a feeling of being overwhelmed by their multiple responsibilities, but were committed to the success of the program. We therefore recommend that the NYC Department of Education increase, rather than decrease, staff support for the program in order to ensure its quality and expand it to other schools.

Increase the number of VE students taking college courses and provide related student supports. About one-quarter of VE students currently take college courses offered through the VE program. By taking college courses while in high school, the students have the opportunity to experience a college environment and better understand the rigors of college coursework. Students can also earn free college credits, thus lowering the cost of postsecondary education. Based on the positive experiences of VE students in college courses, and evidence that dual enrollment is positively associated with academic achievement, we recommend that the VE program more strongly promote this opportunity to all its students. In addition, to ensure their success, we recommend strengthening supports for students while they are taking college courses by offering services such a tutoring or peer mentoring.

Include more students in VE Central workshops. As we have described, the VE Central Office organizes workshops for students on select topics such as filling out tax forms, creating a website, and writing a business plan. Currently, because of space constraints, only a few students from each school can participate in the workshops. To include more students in the workshops, VE could offer workshops at different schools or create an online tutorial that can be accessed by all students and coordinators.

Provide opportunities for all students to engage in academically rigorous work. Due to the hierarchical structure of the VE firm, students in leadership positions often have greater responsibilities and more opportunities to engage in academically rigorous work than do other students. While differentiating the curriculum accommodates different student abilities and interests, some students are not as challenged as others. VE Central recommends that program coordinators rotate students through multiple positions over the course of the school year, but we saw no evidence of such rotation in the programs studied. In the absence of job rotation, coordinators should assign additional projects or tasks to ensure that all students are fully participating in the firm's business and improving their academic skills.

Integrate economics into all VE programs. In some VE firms students study an applied economics curriculum, thereby linking the career technical component with an academic subject required for high school graduation and increasing the rigor of the course. We recommend that all VE programs integrate economics into the curriculum so that students fulfill the economics requirement for high school graduation. Since VE students learn and apply economics concepts while operating their virtual firms, it seems practical for the course to put a stronger emphasis in this area.

Collect data on student outcomes. The VE Central Office collects data on student attendance and participation in VE activities and college courses. It also administers a pre- and post-assessment test. Still, research is needed to determine the impact of VE on students' academic and career outcomes. While our study is an exploratory examination of the VE program and its influence on students, a more rigorous evaluation using a comparison group of non-Virtual Enterprises students is needed to demonstrate that any outcomes are the result of program participation and not other factors.

Expand VE to a broad range of students. According to one VE Central staff member, VE students end the course with a much better idea of what they want for their future: "[VE] lights a little fire – not even little – a big fire" in these students. Seventy-eight percent of the students indicated that VE helped them believe that they could accomplish their goals. One student said, "The class has given me bigger dreams and hopes of what I wish to do in the future." Given the barriers to college participation and completion, it is critical to support programs, such as VE, that help students find relevance in their studies and set higher aspirations for the future. The NYC Department of Education should therefore promote broad access to VE for those students who struggle to find meaning and direction in their education.

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Appendix

The following firms have offered internships to Virtual Enterprises students:

Allen & Co
Anderson Kill O'licky
Apollo Real Estate
Assemblyman Keith Wright's office
Assemblywoman Audrey Pheffer's office
B. Geller Restoration Inc.
Ballet Hispanico
Bank of New York
Baruch College (multiple departments)
Bear Stearns
Belway Electric NYC, LLC
Brooklyn Parents for Peace
C TV
Campaign for the Civic Mission of Schools
Carver Federal Savings Bank
CB Richard Ellis
Center for Law and Justice
CORE
Council member Erik Martin Dilan
Council member Gale Brewer's Office
Deloitte and Touche
NYC Department of Consumer Affairs
NYC Department of Finance
NYC Department of Education (multiple departments)
Donorschoose
Dreyfus-Mellon
Edelman Public Relations
F. J. Sciame Construction Co. Inc.
Federal Reserve Bank
GlobeOp
Greenberg Traurig Law Firm
GVA Williams
HarlemLIVE
Holiday, Fenoglio & Fowler
HSBC Bank HR
Indros Technology
ING Clarion
J. P. Morgan Chase
Joseph Tax & Consulting Svc. LLC
Kaye Scholer, LLP
Learning Express
Lighthouse
Lilker Associates Consulting Engineers, P.C.
Metropolitan Hospital
Michael C. Fina Co.
Monroe College
Moody's Investment
Morningside Center for Teaching Social Responsibility
National Executive Service Corps.
Neo@Ogilvy Advertising/finance
Ogilvy & Mather Advertising
PAL
PENCIL
Perfect Building Maintenance
Pisarkicwicz Mazur & Co. Inc
Progressive Credit Union Bank
Related Industries
Robert Silman Assoc.
Rush Foundation
Rush Philanthropic
Schulte Roth & Zabel, LLP
Senator Bill Perkin's Office
Senator Malcomb Smith
Senator Paterson
Sidley Austin LLP
Simpson Thacher & Bartlett LLP
Smith Barney
SUNY Maritime College
Taconic Investment Partners
Taconic Management Co. LLC.
The Kornreich/NIA Organization
The Levy Group
Times Square Studios, LTD
Tishman NYC Construction Site Office
Weil Gotshal & Manges LLP
WISE
WNYW-Fox 5
YMCA (multiple offices)