

Virtual Schools and 21st Century Skills

Written by

The North American Council for Online Learning and the
Partnership for 21st Century Skills

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Introduction

Online learning through virtual schools is one of the most important advancements in attempting to rethink the effectiveness of education in the United States. The virtual school provides access to online, collaborative and self-paced learning environments – settings that can facilitate 21st Century skills. Today's students must be able to combine these skills with the effective use of technology to succeed in current and future jobs.

The full promise of virtual learning is dependent, however, on its ability to incorporate 21st century skills in its instructional design, delivery and implementation. Virtual school leaders, administrators and teachers must ensure that students who learn in online environments are gaining the skills necessary to compete as citizens and workers in the 21st century. This document attempts to articulate a vision for 21st century learning in virtual schools, and identify ways in which online learning can improve outcomes for all students.

The Case for 21st Century Education

In an increasingly competitive global economy, it is not enough for students to acquire subject-level mastery alone. Skills like creativity, problem-solving, communication and analytical thinking are necessary for all levels of success, from entry-level jobs to engineering and technical fields. However the U.S. K-12 education system as a whole does not yet teach and measure these skills directly. Some sobering statistics:

- Eighty-four percent of employers say K-12 schools are not doing a good job of preparing students for the workplace; 55 percent say schools are deficient in preparing students with basic employability skills (such as attendance, timeliness and work ethic); 51 percent cite math and science deficiencies; and 38 percent cite reading and comprehension deficiencies.ⁱ
- A very small percentage of 4th and 8th grade students US students (less than 30%) perform at a proficient level in math, while up to 20% lack the competence to perform even basic mathematical computations.ⁱⁱ

The implications of such trends are troubling:

- **U.S. students are falling behind their peers internationally.** We can no longer claim that US educational results are unparalleled. Students around the world outperform American students on assessments that measure 21st century skills.
- **U.S. innovation is falling behind.** Innovation and creativity no longer set US education apart. Innovators around the world rival Americans in breakthroughs that fuel economic competitiveness.

- **Workplace jobs and skill demands are not being satisfied.** Leading high tech employers routinely lament the lack of a skilled workforce for the jobs of today, and are alarmed by the prospect of filling the jobs of tomorrow.

If our students are going to compete successfully in the global economy, more must be done to support their acquisition of 21st century skills. Without this shift in educational priorities, the prospects for our students—and our nation—will be diminished significantly.

The Case for Virtual Schools

E-learning is already a major driver for education and training beyond K-12 in higher education, employee training and lifelong learning. In higher education, the Sloan Consortium reported that 2.5 million students enrolled in at least one class online in 2004, equivalent to 11% of all students in accredited degree-granting institutions. Growth in online higher education programs steadily increases by 400,000 students annually. (Source: Sloan Consortium)

Online learning is an essential delivery system for training in the business world. Many corporations today use e-learning for training employees:

- 77% use distributed learning*, up from 4% nine years ago—73% increase in less than a decade!

Why do they spend money on distributed learning?

- A 60% faster learning curve.
- IBM's Basic Blue management training: 2284% ROI
- Motorola: \$30 in productivity gains for every \$1 spent over 5 years.
- Union Pacific: performance increase of 35%. (Source: ThinkEquity Partners, Emerging Trends in Post-Secondary Education: The View to 2012, Dec. 2002. *Distributed learning is online learning alone or blended with multi-media and/or traditional methods.)

21st Century Data through Learning Management Systems

Online delivery through learning management systems can improve data-driven decisions and strengthen the school to parent connection. Online learning allows rich data environments to better inform instructional and administrative decision-making to improve student achievement. Learning management systems include tools that allow parents to view grades, completed or incomplete assignments, teacher feedback, and updates or announcements from teachers. While most middle or high school parents in traditional school settings will admit that they know very little about what goes in during the school day, parents of online students can be as involved as they want to be at the click of a button. As the use of learning management systems grows for online learning, it is quite conceivable that their use will also grow in traditional settings—especially as the lines between online learning and traditional learning continue to blend.

Increasing Opportunities for All Students

In the United States, 40% of high schools do not offer a full college preparatory curriculum. Schools lacking advanced courses are more likely to be in rural or low income communities. Students have more choices and increased access to educational excellence through online learning. Students seeking high quality math, science, foreign languages and other courses that may not be available locally, now have the ability to enroll online.

In addition, students have many choices for personalizing and individualizing instruction to meet their needs. For example, at Florida Virtual School, these options include what month of the year they want to start, what time of day they want to work, where they want to work, and they even have choices about how to respond to assignments. Students may have the option to demonstrate mastery through a PowerPoint presentation, a podcast, a traditional essay, or through the creation of a website. These kinds of options give students the opportunity to shine in their areas of strength.

Do Virtual Schools Produce 21st Century Outcomes?

Mastery of 21st century skills occurs through intentional instructional design, direct instruction of quality curriculum and meaningful assessments—regardless of whether the students complete courses online or in a brick and mortar building. Virtual schools inherently are well-equipped to provide expanded and innovative learning opportunities. It is critical that virtual school leaders embrace a 21st century skills vision for all those who are teaching and learning online to build on their strengths and achieve outcomes that matter for their students.

Virtual school leaders, in course design and quality standards, should include 21st century skills directly, intentionally and measurably. Many programs use high quality course design standards. Ensuring that 21st century skills are included in the standards is essential.

Imagine a geography course online. The assignment requires students to work in teams to identify the best possible location for a new public park in a given city, using GPS mapping software and online research databases. Students must collaborate with their team members online, delegate tasks and co-author a PowerPoint presentation making their case. They are assessed not only on factual knowledge, but also on being able to analyze information, solve problems, collaborate and communicate effectively. Formative assessments build toward the final project.

Imagine, now, a “traditional” teacher interested in acquiring the skills to facilitate such an exciting and supportive learning environment for students. Perhaps this teacher would collaborate with a middle school or high school language teacher. Both teachers would require professional development in how to move into the

online environment, to successfully facilitate students to work together, to develop content knowledge and application, and to develop thinking skills that are not limited to a single content area. Professional development of current teachers and preparation of future teachers requires re-thinking in order to ensure student success in life and work.

Virtual Schools and 21st Century Skills

Virtual schools and online learning is growing rapidly – an estimated 30% annually in K-12 education. Recent research highlights that virtual schools expand access to rigorous academic courses and curriculum; and, training teachers to teach online can improve instruction. When virtual schools intentionally focus on student mastery of 21st century skills, these schools take full advantage of their inherent strengths. They enable:

Global Awareness

In 21st century communities, neighborhoods and workplaces, an understanding of world cultures and the ability to relate to individuals from diverse backgrounds are required skills. Students in online learning environments are well-equipped to develop these skills because they have access to greatly expanded networks of people. Students can easily work with and learn from individuals from all over the world, leading to enhanced awareness of the global nature of communities in the 21st century.

One example of this is the online Chinese Language course offered by the Michigan Virtual High School (MVHS). It is a semester-length course that introduces both language and culture to beginning Chinese language learners. A qualified native Chinese-speaking instructor, with expertise in second language learning teaches the MVHS course. The course employs a task-based language-learning curriculum that focuses on enhancing basic communication skills and cross-cultural, global awareness and understanding. This online course uses a combination of self-study and virtual meeting modules, and is designed around four components: an e-textbook, a group problem-solving project, IP-based audio conferencing and discussion, and a group writing project.

Self-Directed Learning

The fast-paced nature of the knowledge economy means that citizens and workers must know how to continue learning throughout their lives and careers. Directing one's own learning path is not only valuable, but necessary, in the 21st century. Online learning environments provide opportunities for self-paced and directed learning, reinforcing necessary skills. Virtual schools are unique in their abilities to

"I think that students should take online courses because it teaches them how to be independent about their studies. I feel that it helps you out with college in the long run. College is more independent than high school and online classes do help." – Colorado Online student

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empower students in making flexible, individual choices based on their own interests and schedules.

For example, at Florida Virtual School students can choose the rate at which they will complete courses, ranging from a traditional 36-week school year to a reduced or extended time frame depending on individual needs. In doing this, students learn to effectively manage their time, using the module or unit organizers provided in each course and customizing them to fit their unique needs. Since students are able to complete and submit assignments at any time of the day or night, any day of the week, they enjoy significant flexibility while still being held accountable for the end product by instructors. This is a model not unlike the working world of today, where telecommuting and virtual offices are a reality, but accountability and quality expectations for the end product remain high.

Information and communications technology (ICT) Literacy

The rate at which new information becomes available today is astounding when compared to previous decades. In order to succeed in the 21st century, students must master the ability to use appropriate technologies to process, analyze and present information efficiently and effectively in school, life and work settings. Because virtual schools require students to master technology as part of their everyday learning, students are able to exercise and refine their 21st century technology skills in settings that are quite similar to those they will encounter in the real world.

Today's graduates must be adept with the tools of collaboration and communication that are the reality of a global, web-driven workplace. Online learning affords unprecedented opportunities for students to complete their work using applications that are common to today's workers, such as web-based conferencing, project management, or digital media and communications tools.

"In an online class, the student must learn a host of technical skills such as posting to discussions, attaching documents, and accessing online whiteboards. This teaches self sufficiency and basic computer skills regardless of what class they are taking. Although I teach algebra, my online students learn much more than just the algebra curriculum. They're learning other valuable skills that prepare them for the 21st century." – Matt Vangalis, Florida Virtual Online Algebra teacher

Problem Solving Skills

All citizens and workers in the 21st century must be able to think analytically and solve problems if they are to be successful—whether they are entry level employees or high level professionals. Virtual schools are uniquely suited to enhance these skills because they rely upon competency-based learning

models that focus on demonstrable knowledge and skills, not seat time. Further, problem-solving most often requires team or group thinking and development, skills that are routinely developed in online courses.

Such an approach is illustrated by Florida Virtual School, which designs curriculum and teaching practices around the idea of using problem solving skills and real world applications. For example, in a Geometry class, students are directed to complete a project which requires some real world architectural skills. After sharing digital examples of floor plans and blueprints, students are directed to draw a front view of a home. In another assignment, students learn about slope, pitch, rise, and run as they directly relate to local buildings.

Time Management and Personal Responsibility

Skills like problem solving are practically meaningless if students cannot manage their time efficiently and productively. Virtual learning environments encourage students to hone these important life skills. Online classes are structured in ways that require students to be effective in managing their time and responsibilities. Collaborative assignments and tools allow students to coordinate and communicate within groups to delegate tasks and meet deadlines efficiently. All of this reinforces the student’s ability to manage his/her own workload in ways that reflect real world working environments.

“The hardest part about taking an online course is staying up to date. This course taught me more self-discipline in one semester than in all of my other years combined.” – Colorado Online student

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It is important to note, however, that while most virtual schools have enormous potential to enhance 21st century learning, this potential can be realized only if online students are taught these skills in intentional and measurable ways. It is imperative that all students of virtual schools master the skills that are necessary for success in work and life in the 21st century.

Principles - 21st Century Virtual Schools

We believe that 21st century learning is critical to virtual schools. We believe:

- The framework identified by the Partnership for 21st Century Skills should be integrated, wherever possible, into all aspects of virtual school curriculum, instruction and assessment.
- Online students should be expected to demonstrate mastery of 21st century skills as a distinct outcome of their educational experiences.

- Virtual school teachers should be provided with appropriate opportunities to learn effective techniques and best practices for teaching 21st century skills in online environments. Pre-service teachers should have these skills within the course of preparation.
- Collaboration among leaders of virtual schools and those advocating for 21st century skills is vital to producing enhanced learning opportunities for students who are learning online today.

Action Steps – 21st Century Virtual Schools

The following action steps are proposed for virtual school leaders and advocates:

- Ensure that online courses are designed to teach students 21st century skills in direct and measurable ways.
- Project- and portfolio-based assignments must include 21st century skills as outcomes.
- Ensure that online teachers can access a well-designed professional development strategy for online instruction of 21st century skills.
- Identify and employ all applicable high-stakes and formative classroom assessments that can be used in online environments to measure 21st century skills.
- Pursue collaborative efforts with others who are working to integrate 21st century skills into K-12 education: national and state education leaders, community leaders, district leaders, school leaders, etc.

Conclusion

Online learning through virtual schools is one of the most important advancements transforming education in the U.S. It is imperative that 21st century skills be incorporated into the design, delivery and implementation of virtual schools. By expanding access to high quality, rigorous academic courses teaching 21st century skills, we can expand the opportunities for all students. Both P21 and NACOL share a vision of the future of K-12 education that will increase access to educational excellence for all students, teach 21st century skills and improve outcomes for a 21st century society.

Appendix 1: Example

Broward County Public Schools, in partnership with Florida Virtual School, uses online learning in middle and high schools to develop global awareness, self-directed learning, information and communications technology literacy, problem solving, time management and personal responsibility in our student population. An online AP and Honors American History course included:

- * Real world problem solving
- * Evidence of strong collaboration
- * Extensive and varied measures for evaluation

The project increased 21st century skills and created opportunities for students by offering advanced placement and honors courses online. The online courses allowed the students a non-traditional approach to demonstrating content mastery via a wide array of submission styles. The assignment formats consisted of, but were not limited to: timelines, poetry, essays, use of graphics, images and pictorial essays, discussion groups within the class, and a group thematic multimedia presentation. The online courses were designed to deliver rigorous, interesting, web-based, and interactive course content. The curriculum of the project centered on the events of World War II for both the United States and Japan. Through this collaborative project, Japanese and American students had the opportunity to engage in a healthy discourse regarding these topics via videoconferencing and email interaction. Special attention was paid to Japanese-American internment, as well as our present relationship with Japan.

Using videoconferencing technologies, Broward County's Pompano Beach High School students studying Japanese as a foreign language, and their teacher Satako Sagne Fisher, acted as interpreters enabling online students to interact with Japanese high school students in Chiba, Japan. Use of information and communication technologies also provided opportunities for local guest speakers: a Japanese-internment camp prisoner, a Holocaust survivor, and a professor of Asian Studies from Nova-Southeastern University, to videoconference and discuss and debate the similarities and differences between the two confinements during the Second World War with students. Guest speakers also discussed survival stories from both the European concentration camps and the Japanese-American internment camps.

There were four different groups of students who participated in the project: students in Chiba, Japan; online students from Broward Virtual School; and traditional students from both Pompano Beach and Coral Springs high schools. During the course, students presented multimedia presentations they created to understand curriculum themes within the AP and honors American History courses. These multimedia presentations were subsequently housed on a district server and included as both online and traditional course content for future teacher and

student use. Emphasis was placed on core curriculum, problem solving and real-world application.

This project, while researching and studying the social science curriculum of World War II using online course content and technologies, had a deeper rationale. Incorporated into the fabric of this project was a desire to build a bridge across the cultures between students from both countries. By using online and videoconferencing technologies, students of these two countries collaborated “face to face” in an effort to form a dialogue of mutual respect and understanding that created new content and encouraged cultural awareness.

This project was subsequently the recipient of the 2004 Cisco Growing with Technology Award for Innovative Use of the Internet and the 2005 United States Distance Learning Association Bronze Award for Videoconferencing and Online Teaching.

ⁱ “2005 Skills Gap Report - A survey of the American Manufacturing Workforce”, Deloitte Development LLC , 2005

ⁱⁱ “Rising Above the Gathering Storm”, National Academies of Science, 2006