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KAMEHAMEHA SCHOOLS

An Overview of 21st Century Skills

A summary and case study by Brandon C. Ledward and Dorothy Hirata

Introduction

A review of the literature on 21st Century Skills suggests that education must be upgraded for learners to thrive in the new global economy. Success in today's world requires the ability to access, synthesize, and communicate information; to work collaboratively across differences to solve complex problems; and to create new knowledge through the innovative use of multiple technologies. This brief provides a framework for understanding the relevance of 21st Century Skills and highlights research on their impact on learners.¹

Findings

There are four major takeaways from the literature on 21st Century Skills.

1. The world in which learners find themselves today is fundamentally different than before; the expansion of information and communication technology is transforming the nature of learning.
2. 21st Century Skills establish new learner standards by integrating core-subject mastery and contemporary, interdisciplinary themes (e.g., civic literacy, global awareness, and environmental literacy).
3. With the learning environment and teacher competency as primary factors, the development of these skills can be achieved in many ways (e.g., place-based, project-based, or problem-based learning).
4. Although research in this area is relatively young, existing evidence links 21st Century Skills with positive learner outcomes.

Definitions

The Partnership for 21st Century Skills (P21) is a national organization that advocates for the 21st century readiness of every student.² P21 defines 21st Century Skills as a blend of content knowledge, specific skills, expertise, and literacies necessary to succeed in work and life. The North Central Regional Education Laboratory (NCREL) and the Metiri Group (2003) describe these skills as the outcome of 21st century learning, which emphasizes digital-age literacy, inventive thinking, effective communication, and high productivity. In short, 21st Century Skills are more than technological literacy, instead they include proficiency in critical thinking, problem solving, communication, and team work (Paige 2009).

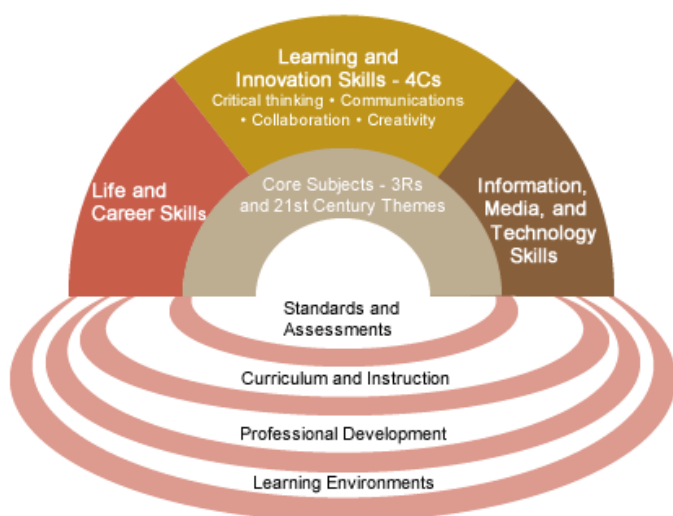
¹ A full literature review by Pacific Policy Research Center (2010) is available at <http://www.ksbe.edu/SPI/reports.php>.

² For more information on the Partnership for 21st Century Skills, visit: www.p21.org.

Framework

The phrase “21st Century Skills” encompasses several inter-related skill sets: life and career skills; learning and innovation skills; information, media, and technology skills; and core-subject mastery and familiarity with interdisciplinary themes. As shown in Figure 1, these skill sets are framed as desired outcomes for learners that are built upon standards and assessments, curriculum and instruction, teacher professional development, and learning environments.³ As such, the framework provides a holistic representation of the student outcomes and support systems required to establish 21st century career and life readiness.

Figure 1. Framework for 21st Century Student Outcomes and Support Systems [Diagram developed by P21]



Core Subjects and Interdisciplinary Themes

Recognizing the continued significance of traditional subjects like English, math, science, and social studies, P21 stresses learning that bridges disciplines with broad and contemporary themes. For instance, civic literacy speaks to the need for students to be able to successfully influence decision making in community affairs and politics. Similarly, environmental literacy represents an area where students develop knowledge and take action on ecological issues. Other examples of interdisciplinary themes include: global awareness, financial literacy, health literacy, and visual literacy (Partnership for 21st Century Skills 2009).

Critical Learning and Innovation Skills

In addition to core-subject mastery and familiarity with interdisciplinary themes, 21st Century Skills require learners to build capacity for careers in today's world. Trilling and Fadel (2009) argue that communication and collaboration are necessary ingredients for career success. Of particular significance are the abilities to articulate ideas clearly, to listen effectively, to utilize multiple media, and to work efficiently and respectfully in diverse teams.

Although critical thinking and problem solving remain salient assets for learners and career seekers, they are given new dimension in the 21st century via advanced technologies for accessing, analyzing, and creating information (Trilling and Fadel 2009). Likewise, creativity and innovation continue to be prized skills in the global marketplace. Contrary to popular belief, scholars suggest creativity can be developed over time in the same way as other skills (Wegerif and Dawes 2004; Loveless 2002).

Life and Career Skills

To meet demands of the new global economy, 21st century Life and Career Skills assist in synthesizing information, working effectively in diverse teams, managing complex projects, and demonstrating responsibility to the community and environment. P21 advocates for learning that focuses on leadership and responsibility, productivity and accountability, and cross-cultural skills. Under P21 standards, learners are able to set and meet goals, plan and prioritize work, multitask effectively, and act in an ethical and professional manner.

Studies indicate that employers are seeking candidates with more than “book smarts.” Instead, they are looking for traits such as adaptability, ingenuity, accountability, and a team-first orientation. These skills were identified as being valuable across a range of industries as well as one's personal life (Murnane and Levy 1996; Levy and Murnane 2004; Casner and Barrington 2006).

Information, Media, and Technology Skills

The abundance of information at one's fingertips does not itself create an informed citizenry. Instead, it requires individuals to develop skills with which to use information effectively. Information literacy refers to the ability to recognize when information is needed and how to locate, evaluate, and put it to proper use. Similarly, it is essential for learners to access, understand, and where appropriate, filter media bias. According to P21, media literacy is achieved when a person grasps ethical issues surrounding the production of media messages and is able to critique the inclusion or exclusion of opinions and factual evidence.

The value of technological literacy has been discussed in a variety of circles from e-learning (Lamb and Callison 2005) to web 2.0 technologies (Greenhow et al. 2009). Not surprisingly, 21st century learning initiatives, informed by research on how people learn best, integrate emerging technologies (e.g., smart phones and social media) and embrace collaborative, participatory experiences.

Emerging research suggests learning content through virtual environments can be successful. Game-based learning gives students a chance to acquire and apply knowledge in simulated game-play. It is an effective instructional tool because it requires players to immerse themselves in dynamic, information-rich settings and to be risk-takers who must tackle problems and learn from both success and failure (McFarlane 2003; Meteri Group 2006).

³ Figure 1 adapted from the Partnership for 21st Century Skills.

Foundations

Learning Environment

P21 defines the 21st century learning environment as the physical and virtual spaces, the assemblage of tools, and the learning communities that enable students and teachers to engage in knowledge and skill development. When most effective, the learning environment represents a “system of systems” that accommodates the unique needs of every learner and supports positive human relationships.

Scholars argue that where students learn affects the quality of how they learn. To cultivate 21st Century Skills, it is imperative that education take shape within flexible, adaptive contexts that inspire a sense of community and promote formal and informal learning. The environment should also allow equitable access to quality learning tools, technologies, and resources (Sak-Min 2009; Black 2007).

Teacher Professional Development

Students would find it difficult to obtain 21st Century Skills without the aid of well-trained teachers who have direct instructional knowledge in this area. Studies show that many teachers are unfamiliar with 21st Century Skills and instructional technologies (Cuban 2003). According to P21, quality professional development ensures educators understand the importance of 21st Century Skills and how to integrate them into daily instruction through a variety of tools (Partnership for 21st Century Skills 2006).

The alignment of 21st Century Skills, standards, curriculum, instruction, new technologies, and assessments resonate with a broader literature on successful teacher professional development programs, which tend to be:⁴

- Experiential—engaging teachers in concrete tasks of curriculum design, implementation, and assessment
- Learner-focused—grounded in teachers’ own questions, problems, and issues
- Collaborative—building upon the collective experiences of participants and the wider community
- Relevant—connected to teachers’ work and contexts
- Sustained and intensive—including ongoing support via modeling and coaching, during and after the program
- Integrated with other aspects of school reform

Research

Educational Studies

The push toward 21st Century Skills is supported by research across several areas. Studies on the role of Information and Communication Technology (ICT) in education indicate that instruction via new media stimulates student learning (McFarlane 2003; Andretta 2005). Using 21st century tools in combination with inquiry- and/or project-based learning is also an effective

⁴ Adapted from Trilling and Fadel (2009).

instructional strategy for increasing critical thinking (Darling-Hammond 2006; Trilling and Fadel 2009). In turn, gains in critical thinking have been shown to produce higher academic achievement (Wenglinsky 2004).

Key Findings

P21 identifies six key drivers of 21st Century Skills:

1. Focus on core subjects
2. Emphasize interdisciplinary learning
3. Incorporate 21st century tools (e.g., technology)
4. Teach and learn in a 21st century context
5. Teach and learn with 21st century content
6. Assess learners in rigorous and relevant ways

In line with Darling-Hammond’s (2006) assessment of best practices in teaching and learning, 21st Century Skills take root when teachers:

1. Begin with real-world problems and processes
2. Support inquiry-based learning experiences
3. Provide opportunities for collaborative project work
4. Emphasize how to learn (i.e., above what to learn)

Case Study: KS Distance Learning

Kamehameha Schools Distance Learning (KSDL)⁵ strives to provide quality educational opportunities for Hawaiian learners through three direct-service programs: ‘Ike Hawai‘i for high school students, A‘o Makua for parents and A‘o Kumu for educators. By focusing on 21st Century Skills development, these online programs seek to increase the readiness of today’s learners for future educational and career opportunities. Online courses allow students to access learning at any time in order to communicate and collaborate with others in a shared, virtual environment.

Knowledgeable and caring teachers facilitate students’ 21st century readiness through innovative, culture-based curricula and individualized instruction. As a result, students strengthen their understanding and connection to Hawaiian culture and increase their proficiency with emerging information and communication technologies. In addition, numerous critical thinking and problem solving activities extend learning to include family members as well as the local and global community.

KSDL’s emphasis on communication and collaboration, critical thinking and problem solving, and technological literacy fosters learner satisfaction and engagement.

“The assignments teach us things that will actually help us in the future. [Using the computer] helps improve our skills.”

—‘Ike Hawai‘i learner

⁵ For more information, visit <http://ksdl.ksbe.edu>

“You have enriched our families’ lives with ideas on where we come from and who we are. Thank you so much!”

—A’o Makua learner

“These courses are by far the most useful professional development I have ever taken. The information is so applicable and easy to integrate into the classroom.”

—A’o Kumu learner



Teachers in the A’o Kumu program build capacity for 21st Century teaching

Conclusion

For nearly a decade, advocates of education reform, including the Partnership for 21st Century Skills and its 14 state partners, have been working toward the 21st century readiness of all learners. Fundamental changes in the economy, owing to the expansion of information technology, have reshaped the labor market. The basic skills that once drove a manufacturing industry are quickly being replaced by non-routine, creative, and collaborative problem-solving tasks.

More than technological expertise, 21st Century Skills refer to content knowledge, literacies, and proficiencies that prepare individuals to meet the challenges and opportunities of today’s world. Now more than ever, it is essential for individuals to access, synthesize, and communicate information, to work collaboratively across differences to solve complex problems, and to create new knowledge through the innovative use of multiple technologies.

Educators play a significant role in the cultivation of 21st Century Skills. By weaving together core-subject mastery and contemporary interdisciplinary themes, teachers can help learners obtain relevant career and life skills. The integration of new technologies with inquiry-, project-, and game-based learning may also increase opportunities for learning. Along with quality teacher professional development, a healthy and responsive learning environment is critical to 21st century success.

References

- Andretta, S. 2005. *Information literacy: A practitioner’s guide*. Oxford, UK: Chandos Publishing, Ltd.
- Black, R. 2007. Fanfiction writing and the construction of space. *E-Learning and Digital Media* 4 (4).
- Casner-Lotto, J., and L. Barrington. 2006. Are they really ready to work? Washington, DC: Conference Board, Partnership for 21st Century Skills, Corporate Voices for Working Families, and Society for H.R. Management.
- Cuban, L. 2003. *Oversold and underused: Computers in the classroom*. Cambridge, MA: Harvard University Press.
- Darling-Hammond, L. 2006. *Powerful learning—What we know about teaching for learning*. New York: Jossey-Bass.
- Greenhow, C., B. Robelia, and J. Hughes. 2009. Learning, teaching, and scholarship in a digital age: Web 2.0 and classroom research: What path should we take now? *Educational Researcher*, 5 (38): 246–59.
- Lamb, A., and D. Callison. 2005. Online learning and virtual schools. *Key Words in Instruction*, 21 (9): 29–35.
- Levy, F., and R. Murnane. 2004. *The new division of labor: How computers are creating the next job market*. Princeton, NJ: Princeton University Press.
- Loveless, A. 2002. *Literature review in creativity, new technologies, and learning*. Report 4: A report for the NESTA Futurelab.
- McFarlane, A. 2003. Assessment for the digital age. *Assessment in Education: Principles, Policy & Practice*, 10:261–66.
- Metiri Group. 2006. *Technology in schools: What the research says*. Commissioned by CiscoSystems. <http://www.cisco.com/web/strategy/docs/education/TechnologyinSchoolsReport.pdf> (accessed November 15, 2010).
- Murnane, R., and F. Levy. 1996. *Teaching the new basic skills*. New York: The Free Press.
- NCREL & Metiri Group. 2003. *enGauge 21st century skills: Literacy in the digital age*. Naperville, IL: NCREL & Metiri Group.
- Paige, J. 2009. The 21st century skills movement. *Educational Leadership*, 9 (67).
- Partnership for 21st Century Skills. 2009. *Professional development for the 21st century*. http://www.p21.org/documents/P21_Framework.pdf (accessed November 15, 2010).
- Pacific Policy Research Center. 2010. *21st century skills for students and teachers*. Honolulu: Kamehameha Schools, Research & Evaluation.
- Partnership for 21st Century Skills. 2006. *Framework for 21st century learning*. <http://www.p21.org/documents/ProfDev.pdf> (accessed November 15, 2010).
- Rakes, G., Fields, V., and K. Cox. 2006. The influence of teachers’ technology use on instructional practices. *Journal of Research on Technology in Education*, 38 (4): 411–426.
- Sack-Min, J. 2007. Building the perfect school. *American School Board Journal*, October 2007.
- Trilling, B., and C. Fadel. 2009. *21st century learning skills*. San Francisco, CA: John Wiley & Sons.
- Wegerif, R., and L. Dawes. 2004. *Thinking and learning with ICT*. London: Routledge.
- Wenglinsky, H. 2004. Closing the racial achievement gap: The role of reforming instructional practices. *Education Policy Analysis Archives*, 12 (64).