

21st Century Curriculum and Instruction

The relationship between curriculum and instruction is obviously a very close one. Curriculum is essentially a design, or roadmap for learning, and as such focuses on knowledge and skills that are judged important to learn. Instruction is the means by which that learning will be achieved. To meet the needs of the 21st century learner and achieve the student outcomes described in its Framework, the Partnership calls on schools

- to adopt a **21st century curriculum** that blends thinking and innovation skills; information, media, and ICT literacy; and life and career skills in context of core academic subjects and across interdisciplinary themes, and
- to employ methods of **21st century instruction** that integrate innovative and research-proven teaching strategies, modern learning technologies, and real world resources and contexts.

The Partnership's approach to curriculum is well supported by academic research. In this section, we'll look at just a few of any number of effective, research-based curricular models capable of supporting a 21st century skills learning agenda. We're all familiar with the old-fashioned curriculum of the 3 R's – reading, 'riting, and 'rithmetic, but Robert Sternberg of Tufts University has called for a curriculum that centers on developing student competence in what he calls "the other 3 R's." In this case, the R's stand for *Reasoning* which include analytical, critical thinking, and problem solving skills, *Resilience* which encompasses life skills such as flexibility, adaptability, and self-reliance, and *Responsibility* which Sternberg links to wisdom, which he defines as "the application of intelligence, creativity, and knowledge for a common good."¹

Tony Wagner and Robert Kegan, co-directors of the Change Leadership Group at Harvard University, recommend a curriculum built on a different set of "new 3 R's" – that is, Rigor, Relevance, and Respect.² (Note that the Change Leadership Group's 3 R's address instructional approaches, while Sternberg's R's are framed as student outcomes.) *Rigor*, for Wagner, et al, does not mean content that is difficult for students to master, rather it concerns what students are able to *do* as a result of their learning. *Relevance* means helping students understand how their learning connects to their further studies and future work settings. *Respect* means promoting respectful

¹ Sternberg, R. & Subotnik, R., eds. (2006). *Optimizing Student Success with the Other Three Rs: Reasoning, Resilience, and Responsibility*. Greenwich, CT: Information Age Publishing.

² Wagner, T., Kegan, R., Lahey, L., Lemons, R., Garnier, J., Helsing, D., Howell, A., Rasmussen, H. (2006). *Change Leadership: A Practical Guide to Transforming Our Schools*. San Francisco: Jossey Bass.

relationships between and among teachers and students that foster academic and social competence.

Other notable curricula have been proposed by Harvard researcher David Perkins, who has long advocated that thinking skills be taught as a “meta-curriculum” intertwined with traditional core subjects,³ and Marc Tucker and Judy Coddling, who citing decades of research, urge schools to adopt “a thinking curriculum – one that provides a deep understanding of the subject and the ability to apply that understanding to the complex, real-world problems that the student will face as an adult.”⁴

These are just some of the many ways to approach a 21st century curriculum. The point in describing several models is to demonstrate the soundness of a variety of approaches. There is no one best approach for teaching 21st skills. Each school system must determine what makes the most sense given their unique circumstances. As this paper demonstrates, the Partnership’s call for the integration of cognitive and social skills with content knowledge is not new to this century. There are, however, a few critical components that 21st century schools should make part of their curricula

Perhaps foremost, and most obvious, is that the curriculum must go beyond content knowledge to include a strong emphasis on 21st century skills development. Research shows that when schools employ a curriculum that balances knowledge and skills, students may cover fewer topics, but they generally learn more than with a content-only curriculum. “The illusion of covering less is just that – an illusion,” states David Perkins. “Perhaps fewer pages have been read, but the knowledge gains are almost always about the same or better. The topper, of course, is that gains in understanding and insight are often much greater...”⁵

John Bransford (2007) has observed that many people mistakenly feel students cannot be asked to master what are sometimes called “higher-level skills” unless they first learn basic content like that tested on standardized tests. But actually, he states, “people are built to be learners who inquire and interrogate and get feedback as they learn to solve complex problems. So learning-to-learn and inquiry skills, guided by the ability to ask relevant questions due to knowledge of the ‘big ideas’ of various disciplines, are actually the fundamental skills that we need to emphasize.”⁶

³ Perkins, D. “Integrating Thinking and Learning Skills Across the Curriculum.” In Jacobs, H. (1989). *Interdisciplinary Curriculum: Design and Implementation*. Alexandria, VA: Association for Supervision and Curriculum Development.

⁴ Tucker, M.S. & Coddling, J.B. (2002/1998).

⁵ Perkins, D. in Jacobs, H. (1989).

⁶ Bransford, J. (2007). Personal email communication with Ken Kay, President of the Partnership for 21st Century Skills, dated October 12, 2007.

As with curriculum, any number of pedagogical approaches may be successfully employed to build student competence in the skills and knowledge Bransford describes. The choice of instructional strategies is best made on a local level, taking into account the resources, expertise, and learning needs of that particular community of learners. But there are a number of research-supported approaches that have proven to be effective ways to enhance learning of both skills and content. One such approach is *problem-based learning* (or PBL), an instructional strategy in which “students investigate rich and challenging issues and topics, often in the context of real world problems.”⁷ PBL models may also include other aspects of 21st century instruction such as the use of interdisciplinary content, cooperative learning groups, and student reflection. Research has shown that because working with problems requires students to generate ideas and provide explanations, it promotes learning.⁸ Problem-based learning also has been shown to increase students’ active engagement with content, as well as their capacity for self-directed learning, collaboration, and social interaction.⁹

Another pedagogy that supports 21st century skills is *cooperative learning*. Organizing students in well-structured heterogeneous groups has been shown to have a powerful effect on learning.¹⁰ Such groupings also have the advantage of promoting teamwork, leadership and other life/career skills, while enhancing student academic performance.

Using *real world contexts* is another key component of 21st curriculum and instruction. Research shows that when teachers create meaningful learning activities that center on the resources, strategies, and contexts that students will encounter in adult life, such teaching reduces absenteeism, fosters cooperation and communication, builds critical thinking skills, and boosts academic performance.¹¹ When students see the connection between what they are learning and real world issues that matter to them, their motivation soars, and so does their learning.¹² Developing a robust and engaging 21st century curriculum and employing 21st century instruction means that teachers and school leaders will need to look outside the school walls and seek ideas, resources, and expertise where they are found – in their

⁷ The George Lucas Educational Foundation (2002). *Edutopia: Success Stories for Learning in the Digital Age*. San Francisco: Jossey-Bass.

⁸ Knowlton, D. (2003). “Preparing Students for Educated Living” in Knowlton, D. & Sharp, D., eds. (2003). *Problem-based Learning for the Information Age*. San Francisco: Jossey Bass

⁹ Knowlton, D. (2003).

¹⁰ Marzano, R., Pickering, D., and Pollock, J. (2001). *Classroom Instruction that Works: Research-based Strategies for Increasing Student Achievement*. Alexandria, VA: ASCD.

¹¹ Curtis, D. & Armstrong, S. “Project-based Learning Online,” in The George Lucas Educational Foundation (2002).

¹² Bransford, et al. (2000).

community; in professional and educational groups; and in individuals, schools, and organizations around the world.

Educational technologies, of course, are an essential part of a 21st century curriculum, too. It's important, though, to realize that this does not mean teaching technology for its own sake – but rather applying appropriate technologies to instructional tasks in order to enrich the learning of both traditional and 21st century content, as well as promote the development of 21st century skills. And “appropriate technology,” in some cases, may mean a pencil, or a book, or a conversation.

Twenty-first century schools, though, also take advantage of advanced technologies. Pedagogies that thoughtfully incorporate today's learning tools yield research-proven learning benefits, such as enabling students to employ simulations to “see” microscopic processes or “re-live” historical events. Communications technologies facilitate giving and receiving feedback and allow students to progressively revise their work – all instructional strategies that have been shown to enhance learning.¹³ And today's digital tools make it possible to expand the walls of the classroom and enable the integration of resources – scientific data, library collections, video and film archives – from across the globe into the curriculum.¹⁴ As noted earlier, instruction that features real world contexts facilitates the transfer of learning from school to life.¹⁵ Digital communications make it possible to bring in wisdom and lived experience of people in the community, as well as experts from the worlds of science, business, government and higher education – and thus, bring life to learning.

Although listed as a separate 21st century support system (and addressed in another section of this paper), assessment is inextricably linked to instruction. Thus, we can't leave the topic of 21st century instruction without touching on formative assessments, assessments that enable a teacher to evaluate learning while it is occurring. Such assessments make it possible to diagnose learning gaps, and address them before they lead to more fundamental misunderstandings of knowledge or misapplication of skills. Formative assessment tools such as rubrics play an important role in the 21st century classroom by providing teachers and students with clear guidelines on what constitutes acceptable levels of achievement.

To guide educators in using technology to promote 21st century curricula and instruction, the Partnership, in collaboration with several content area organizations, has developed a series of ICT Literacy Maps illustrating the

¹³ Bransford, et al. (2000).

¹⁴ Bransford, et al. (2000).

¹⁵ Bransford, et al. (2000).

intersection between Information and Communication Technology (ICT) Literacy and core academic subjects. These maps enable educators to view concrete examples of how ICT Literacy can be integrated into core subjects, while making the teaching and learning of core subjects more relevant to the demands of the 21st century. Maps are available at the Partnership's website

(http://www.21stcenturyskills.org/index.php?option=com_content&task=view&id=31&Itemid=33%20) in the following core subjects:

- Science
- Geography
- Math
- English

Conclusion

Curriculum and instruction are at the heart of any educational endeavor, as they determine what is taught, and how. As the section above has shown, there is no "one best system"¹⁶ to achieve a 21st century education. Every district, every school, every classroom, every learner is unique, thus, curricula and pedagogies must be crafted for unique circumstances. Research does, though, offer some important guidelines. A 21st century education depends on an integrative approach to curriculum – one that unites core academic subjects, interdisciplinary themes, and essential skills – with an integrative approach to instruction in which modern pedagogies, technologies, resources, and contexts work together to prepare students for modern life.

¹⁶ Tyack, D. (1974). *The One Best System: A History of American Urban Education*. Cambridge, MA: Harvard University Press.