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Research-Based Options for Education Policymaking

Twenty-first-Century Skills and Implications for Education

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"Teaching 21st-century skills" is a commonly heard school-reform catch-phrase. But the exhortation has very different meanings, depending on who is speaking.

One prominent interpretation of "21st century skills" is reflected in the influential SCANS report (Secretary's Commission on Achieving Necessary Skills), which focuses on a person's ability and willingness to rapidly learn new skills, exercise responsibility, work as a team player, embrace cultural diversity, access and evaluate information, be creative, and practice negotiating skills.[1] Following a similar line of thought, labor economists Murnane and Levy conclude that jobs increasingly require non-routine cognitive skills. Thus, "soft skills"—such as facility with solving semi-structured problems, the ability to work in groups with persons of various backgrounds, effective oral and written communication skills, and the ability to use personal computers to carry out simple tasks—become fundamental.[2] This emphasis on soft skills has also been endorsed by the National Governor's Association and the American Youth Policy Forum.[3]

Appealing to concerns about the nation's international economic competitiveness, the Obama administration presents a different perspective on 21st-century skills, often in connection with support for the Race to the Top criteria and the promotion of "career and

college readiness" standards such as the Common Core State Standards (CCSS).[4] The president also advocated for more rigorous science, technology, engineering, and math (STEM) education in his State of the Union address.[5]

In broad brush strokes, the debate about 21st century skills is represented by these two perspectives: soft skills with constructivist learning versus test-based, set-piece, top-down prescribed subject matter. In theory, few would embrace such a stark contrast, as evidenced by the CCSS listing of "habits of mind."[6] But given the CCSS testing component (primarily the work of the two national testing consortia), the key question becomes whether and how these soft skills will be included in assessment and implementation.

The dominant policy since the watershed *Nation at Risk* report in 1983 has been test-based and cognitive.[7] This was given a strong boost in 1994 by the requirement for state standards in Goals 2000[8] followed by the No Child Left Behind Act of 2001.[9] Unfortunately, as the education secretary's own Commission on Equity and Excellence concluded, this approach has not worked very well.[10] The National Research Council came to similar conclusions, finding that the gains are "concentrated in elementary grade mathematics and are small in comparison with the improvements the nation hopes to achieve." Adverse side-effects include curriculum narrowing and an increase in drop-outs when tests are tied to graduation requirements.[11]

Recognizing the additional need for soft skills, various groups are working to reconcile these perspectives through mechanisms such as the three R's plus the four C's (Critical thinking and problem solving, Communication, Collaboration, and Creativity and innovation).[12] Yet given our history of testing as well as current obstacles, it seems likely that the four C's will end up being treated merely as weak add-ons to the three R's.

Seeking a more responsive and integrated model to meet 21st century learning requirements, Saunders developed a policy brief and recommendations on how the blending of the two perspectives could be achieved.[13] Initially named "Multiple Pathways" and later dubbed "Linked Learning," this approach has been adopted in various forms by states and school districts. She describes an approach that combines academic and technical learning, provided in the context of real-life situations.[14] Rather than the traditional one-size-fits-all, classroom-based approach to education, a rich variety of options are open to students, including higher education, workforce internships, career academies, magnet schools, small learning groups and technical centers. This stimulates student interest and promotes engagement, which also increases students' ability to access the full range of post-secondary options.

As contrasted with tracking, all students in a Linked-Learning school are provided with a high-quality education that maintains both college and workforce options.[15] As contrasted with a uniform paper-and-pencil form of assessment, students demonstrate proficiencies through a broad variety of assessment strategies. Linked Learning has been found to increase student academic engagement, increase learning, improve graduation rates and higher education participation, and promote civic learning.[16]

Recommendations

- Accountability systems must allow for the demonstration of student proficiencies through a broad array of assessment methods beyond conventional test-based systems tied to a system of test-based sanctions. Formative assessment goals must be balanced with summative goals. Excessive focus on the latter narrows the curriculum, narrows learning opportunities and increases dropouts.[17]
- Accountability systems must be re-focused on the degree to which the school provides authentic opportunities to learn[18] through a wide variety of learning experiences.
- Internal school structures for learning must
    - Encompass a range of learning sites beyond the walls of the high school;
    - Provide greater flexibility in school schedules, day and year;
    - Replace tracking and ability grouping with universal acceleration;[19] and
    - Modify support structures such as teacher credentialing, professional development, and the structure of standards to encourage multi-disciplinary studies and approaches.[20]
- Work-based learning opportunities have been common for decades. Proficiencies and competencies must be defined for these school venues and adopted as legitimate parts of the school curriculum.
- Cooperation between secondary and higher education must be expanded through vehicles such as joint planning groups, which could adopt admission requirements for high school students and support "dual enrollment" in college and high school.
- Teaching in a Linked-Learning environment requires integrated, multi-discipline, experiential and interactive curricula and modes of instruction. This requires extensive re-development and new skill sets for teachers. Teacher training must include soft skills curricula along with academic and technical curricula, beginning in pre-service training. The support and involvement of educational leaders is essential.
- The transition to Linked Learning requires careful planning and implementation. Training and retraining will likely depend upon the reallocation of existing personnel and resources.
- To both enable and encourage implementation of Linked Learning, and to ensure that other policies do not thwart its expansion, even unintentionally, policymakers may wish to consider state legislation that would support a Linked-Learning approach. Model language to that end can be found at: http://nepc.colorado.edu/files/NEPC-LL-MP-2011.pdf/, pp. 29-36.

Notes and References

1 What Work Requires of Schools: A SCANS Report for America 2000. The Secretary's Commission on Achieving Necessary Skills, U. S. Department of Labor, June, 1991. Retrieved March 21, 2013, from http://www.uni.edu/darrow/frames/scans.html/;

Lerman, R. (November 2010). Symposium on 21st Century Skills. APPAM annual meeting, Boston. See also "Building a wider skills net for workers" at http://www.issues.org/24.4/lerman.html/.

2 Murnane, R. J. & and Levy, F. (1996).Teaching the New Basic Skills: Principles for Educating Children to Thrive in a Changing Economy. New York: The Free Press.

3 National Governors Association (2003). Ready for Tomorrow: Helping All Students Achieve Secondary and Postsecondary Success: A Guide for Governors: 4. Retrieved November 8, 2008, from http://www.nga.org/cda/files/0310READY.pdf/;

Brand, B. (2003). Rigor and relevance: A new vision for career and technical education, A white paper. Washington, DC: American Youth Policy Forum. Retrieved November 8, 2008, from http://www.aypf.org/publications/aypf_rigor_0004v.3.pdf/.

4 Montopoli, B. (March 10, 2009). "Obama's Remarks on Education." CBS news. Retrieved February 27, 2013, from http://www.cbsnews.com/8301-503544_162-4855902-503544.html/;

Duncan, A. (November 9, 2009). Economic Security and a 21st Century Education: Secretary Arne Duncan's Remarks at the U.S. Chamber of Commerce's Education and Workforce Summit. Retrieved February 27, 2013, from http://www2.ed.gov/news/speeches/2009/11/11092009.html/;

College and Career Ready Standards and Assessments. U. S. Government. Retrieved February 27, 2013, from http://www2.ed.gov/policy/elsec/leg/blueprint/faq/college-career.pdf/;

Yatvin, J. (March 2013). Warning: The Common Core standards may be harmful to children. *Phi Delta Kappan*. *94*(6), 42-44.

While the Yatvin article concentrates on English Language Arts content, the high school mathematics content, raises similar concerns. Retrieved February 27, 2013, from http://www.corestandards.org/Math/,.

5 Brenchly, C. (February 13, 2013). In State of the Union, Obama Outlines Bold Education Proposals to Grow the Middle Class. Retrieved February 27, 2013, from http://www.ed.gov/blog/2013/02/in-state-of-the-union-obama-outlines-bold-education-proposals-to-grow-the-middle-class/.

6 Retrieved May 6, 2013, from http://www.ocde.us/CommonCoreCA/Pages/Habits-of-Mind.aspx/.

7 A Nation at Risk (August 3, 2004). *Education Week*. Retrieved April 2, 2013, from http://www.edweek.org/ew/issues/a-nation-at-risk/;

Ravitch, D. (October 30, 2002). A Brief History of Testing and Accountability. Hoover Digest, No. 4. Retrieved April 2, 2013, from
http://www.hoover.org/publications/hoover-digest/article/7286/.

8 Summary of Goals 2000: Educate America Act. Retrieved April 2, 2013, from
http://www.ncrel.org/sdrs/areas/issues/envrnmnt/stw/sw0goals.htm/.

9 Retrieved May 6,2013 from
http://www2.ed.gov/policy/elsec/leg/esea02/index.html/.

10 Edley, C. & Mariano-Forentino, C., Co-chairs (February 2, 2013). *A Strategy for Equity and Excellence for Every Child. A Report to the Secretary*. Retrieved March 21, 2013 from
http://www2.ed.gov/about/bdscomm/list/eec/equity-excellence-commission-report.pdf/.

11 National Academies (May 26, 2011). Incentives and Test-Based Accountability in Education. Retrieved March 21, 2013 from
http://www8.nationalacademies.org/onpinews/newsitem.aspx?recordid=12521/.

12 See Partnership for 21st century Skills. http://www.p21.org/ For a similar perspective see Center for 21st Century Skills at
http://www.skills21.org/.

13 The brief is accompanied by model statutory code, written by Christopher Chrisman. See:

Saunders, M. & Chrisman, C. (April 2011). Linking Learning to the Twenty-first Century: Preparing all students for college, career and civic participation. Boulder, CO: National Education Policy Center. Retrieved March 21, 2013, from
http://nepc.colorado.edu/publication/linking-learning/.

14 Among the myriad articles, from many perspectives, on this topic, see:

Public Broadcasting Service (n.d.). John Dewey (1859-1952) *Only a Teacher: Schoolhouse Pioneers.* Retrieved April 2, 2013, from
http://www.pbs.org/onlyateacher/john.html/;

DuFour, Richard, DuFour, Rebecca, Eaker, R. & Many, T. (2010) *Learning by Doing: A Handbook for Professional Learning Communities at Work* (Second Edition). Retrieved April 2, 2013, from
http://files.solution-tree.com/pdfs/Reproducibles_LBD2nd/LBD2ndeditionactionguide.pdf/;

Schank, Roger C. (1995) What We Learn When We Learn by Doing. (Technical Report No. 60). Northwestern University, Institute for Learning Sciences. Retrieved April 4, 2013, from
http://cogprints.org/637/1/LearnbyDoing_Schank.html/.

15 Saunders & Chrisman, 2011 (see note 13).

16 Saunders & Chrisman, 2011 (see note 13).

17 National Academies (2011, May 26). *Incentives and Test-Based Accountability in Education*. Retrieved March 21, 2013, from
http://www8.nationalacademies.org/onpinews/newsitem.aspx?recordid=12521/;

Center on Education Policy (July 2005).NCLB: Narrowing the Curriculum (Policy Brief No. 3). Retrieved April 3,2013, from
http://www.cep-dc.org/displayDocument.cfm?DocumentID=239/.

18 See for example:

Carter, P. L. & Welner, K. G. (Eds) (2013). *Closing the Opportunity Gap: What America Must Do to Give All Children an Even Chance*. New York: Oxford University Press;

Oakes, J. (1990). Multiplying Inequalities: The Effects of Race, Social Class, and Tracking on Opportunities to Learn Mathematics and Science. RAND. Retrieved April 2, 2013, from
http://www.eric.ed.gov/PDFS/ED329615.pdf/.

19 Burris, C. C., Welner, K. G., & Bezoza, J. W. (2009). *Universal Access to a Quality Education: Research and Recommendations for the Elimination of Curricular Stratification*. Boulder, CO: Nation Education Policy Center. Available online at
http://nepc.colorado.edu/publication/universal-access/.

20 Oakes, J. & Saunders, M. (2008). Beyond Tracking: Multiple Pathways to College, Career and Civic participation. Cambridge, MA: Harvard Education Press.

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