

THE TEACHING AND LEARNING OF TWENTY-FIRST CENTURY SKILLS

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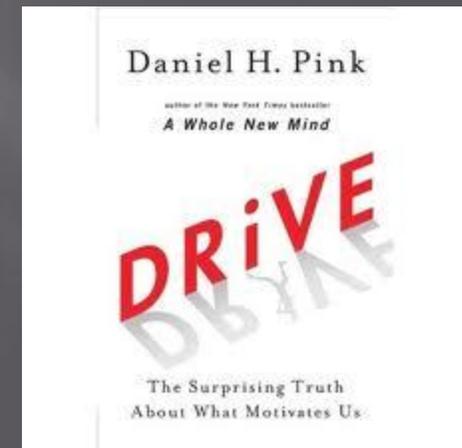
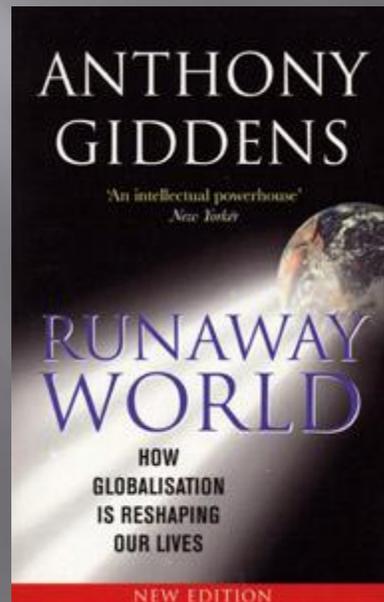
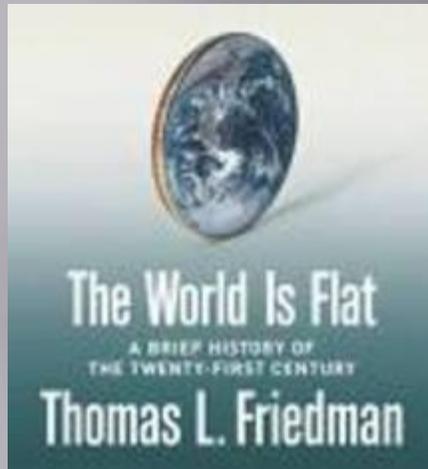
TWO QUESTIONS:

1. What is known about the extent to which the three skill-clusters can be taught and learned?
2. To what extent are the learning, teaching, and assessment of these skills domain-specific or domain-general?

ADDITIONAL QUESTIONS:

-If 21st century skills are valued, does that necessarily mean that they will be taught?

-What do we have to do to prepare teachers and workplace trainers to effectively teach these skills?



.. NRC/NSF (2007)

- ı Adaptability
- ı Complex communication/social skills
- ı Non-routine problem-solving
- ı Self-management/self-development
- ı Systems-thinking



Numerous categorizations

- Voogt & Pareja-Roblin (2010)
 - Summarized 59 international documents
 - *“collaboration, communication, ITC literacy, and social and/or cultural competencies”* (p. i).

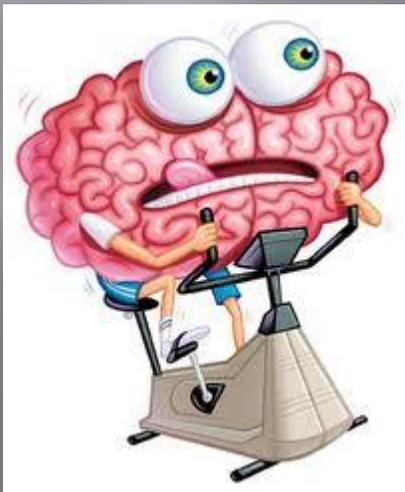
To what extent are the learning, teaching, and assessment of these skills domain-specific or domain-general?

- Bottom line: There are some aspects of 21st century skills that are “general,” but they should primarily be taught within specific contexts/domains.

Why come to this conclusion?

- Evidence from research on transfer
 - It doesn't often happen!
- Evidence from research on problem-solving (e.g., Mayer, Wittrock...)
 - Teaching Latin or LOGO
- Evidence from research in educational psychology
 - Reciprocal Teaching (Palincsar & Brown, 1984)

To what extent can
21st century skills be
taught and learned
within the three
domains?



Cognitive

- .. What types of skills?
 - ı Problem-solving
 - ı Critical-thinking
- .. Research indicates that these skills can be taught (Halpern;Mayer & Wittrock; Sternberg; etc.).
- .. Numerous examples within university courses
 - ı University of Michigan
 - ı University of Texas
 - ı The Ohio State University

Interpersonal

- .. What types of skills?
 - ı Complex communication
 - ı Social skills
 - ı Teamwork
 - ı Cultural sensitivity
- .. Emphasis in curricula in Business MBA programs
 - ı Harvard University
 - ı University of Michigan

- .. Valued within teacher education

- ı NCATE standard 1g:

- ı “Candidates work with students, families, colleagues, and communities in ways that reflect the professional dispositions expected of professional educators as delineated in professional, state, and institutional standards. Candidates demonstrate classroom behaviors that create caring and supportive learning environments and encourage self-directed learning by all students.” (NCATE, 2008, p. 20)

.. Cultural Competence

- ı Example from nursing (Calvillo et al., 2009)
- ı Debate about how to teach these
 - ú Ed Psych textbooks



.. Working cooperatively

- ı Very important
- ı Cooperative learning effect sizes @ $d = .50$ (Hattie, 2009)
- ı Numerous beneficial outcomes
 - ú Increased achievement (Hattie, 2009)
 - ú More effective instruction in cognitive skills (Burke & Williams, 2008)
 - ú More effective help-seeking strategies (Webb, 1992)
 - ú More accepting of individuals from diverse backgrounds (Slavin & Cooper, 1999)
 - ú More accepting of individuals with disabilities (Madden & Slavin, 1983)

Intrapersonal

- What types of skills?
 - Self-management
 - Self-regulation
 - Executive-functioning
- Focus on how learners activate and control cognition, emotion, and academic/work behaviors (Zimmerman, 2002)

- .. Research indicates that these skills can be taught and improved across a number of domains:
 - ı Motivation (Meece, 1994)
 - ı Mathematics (Cleary & Chen, 2009)
 - ı Science (Schraw et al., 2006)
 - ı Literacy (Graham, Harris, & Troia, 1998)
- .. Self-regulation differs across subject domains (Vanderstoep et al., 1996)

- When teaching these skills, focus on distinct aspects: (Schunk & Zimmerman, 2006)
 - Forethought
 - Performance/volitional control
 - Self-reflection

Recommendation #1

- .. 21st century skills can be taught as “general” skills, but that alone is insufficient; instruction must be supplemented consistently within specific domains and contexts.

Recommendation #2

- When general 21st century skills are taught, focus on making basics of these skills become automatic.
 - e.g., basic mathematical skills, basic scientific skills

Recommendation #3

- Teach applications of 21st century skills consistently (i.e. using the same terminology) within domain/subject-specific courses
 - e.g., teach critical-thinking skills consistently in , writing, foreign language, etc.
 - Using the same terminology should facilitate transfer

Recommendation #4

- Teach metacognitive strategies as well as cognitive, interpersonal, and intrapersonal strategies.
 - Metacognition – thinking about one’s thinking



Recommendation #5

- When 21st century skills are taught, the teacher or trainer should not assume that those skills will easily and automatically transfer to other settings; similarly, the teachers or trainers who know that their students have been trained in these skills in other settings should not assume that those students will automatically bring those skills into the new settings easily.

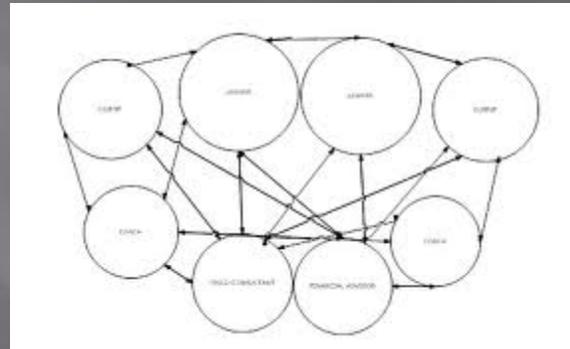
Recommendation #6

- Recognize that the use of 21st century skills involves both “skill” and “will” (Corno, 2008). Students have to value these skills and want to use them!



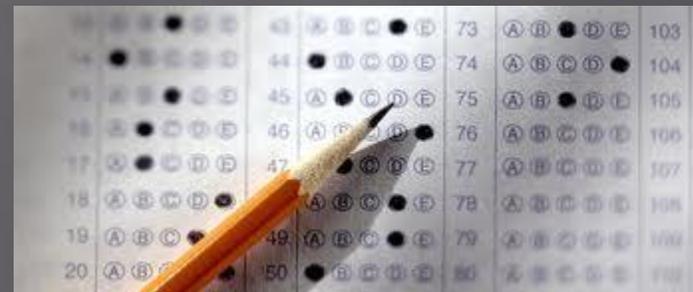
Recommendation #7

- .. 21st century skills should be taught in an interdisciplinary manner. Educators need to be trained consistently in these skills. Educators must use a common language with students and with each other when discussing these skills.



Potential Roadblocks...

- No Child Left Behind
- Standardized testing
- Paradigm differences within teacher education programs (“anti psychology”)



Thank you!

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