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Ruzanna Topchyan, Ph.D.

Focus on Learning 21st Century Skills

AT A GLANCE

"21st-century skills" is one of the most ubiquitous terms in today's education debates. They are viewed as a set of abilities that students need to develop in order to succeed in the current ever-changing society. The purpose of this research capsule is to bring in some information about the attempts to capture, teach and assess 21st century skills so that we can learn from the existing experiences.

INTRODUCTION

The 21st century skills have been discussed by many and in many countries on different continents. Today's skills shortages are extremely broad and deep, they create human capital performance gap that threatens the nation's ability to compete. The danger exists that Americans may not know enough about science, technology, or mathematics to contribute significantly to, or fully benefit from, the knowledge-based economy that is already taking shape at our times. Low skilled workers on the other hand, as the *New York Times* reported are being laid off and "turned away at the factory door and increasingly becoming the long-term unemployed . . ." Understanding of the above creates the importance of focusing on 21st Century Learning.

21st Century Skills' Framework

While 21st century skills seem to be "any-century skills" (Silva, 2009), several attempts have been made to capture them and to create frameworks that could help their targeting.

Griffin, McGaw and Care (2015) categorized 21st century skills into: (a) *Ways of Thinking* (i.e. creativity and innovation; critical thinking, problem solving, decision making; learning to learn, metacognition), (b) *Ways*

of Working (i.e. communication, collaboration -teamwork), (c) *Tools for Working* (i.e. information literacy, ICT literacy), and (d) *Living in the World* (i.e. citizenship – local and global, life and career, personal and social responsibility – including cultural awareness and competence)

Dede (2010) attempted to compare current major frameworks for 21st Century skills to identify their similarity and difference. The frameworks compared were: (a) *Partnership for 21st Century Skills (P21)*, *the Metiri Group and NCREL(Metiri/NCREL)*, *the American Association of Colleges and Universities (AACU),* and *the Organization for Economic Cooperation and Development (OECD), (b)* two frameworks that related to information and communication technology: Revised ISTE student standards for technology in curriculum; Digital Literacy Standard from Educational Testing Service ICT Literacy Panel, (c) lists of digital literacies suggested by individual researchers: *Dede's Neomillenial Learning Styles*, and *Jenkins' Literacies based on New Media*. *Partnership for 21st Century Skills* was used as baseline for comparison.

The study concluded that the frameworks that argue for 21st century skills are largely consistent in terms of what needs to be added to the curriculum, however, each makes an emphasis on some primary skillset. For instance, ISTE and ETS seem to make emphasis on technical skills, whereas frameworks advocating for digital literacies articulate fluencies in information and communication technologies being most important. Some organizations suggested ideas that do not seem to be part of classroom culture convention. An example is autonomous actions by students suggested by OECD and Metiri/NCREL. The researcher concludes that in the 21st century skills movement educators might need to reexamine the "tacit beliefs, assumptions and values about schooling that are legacies from 10th century and industrial age".

21st Century Skills and Deeper Learning

The discussion of 21st century skills closely relates to the discussion of deeper learning because deeper learning allows to develop transferable skills and knowledge (i.e. transferable competencies) that can make learners perform successfully in a context with insufficient commonality. Deeper learning emphasizes not only cognitive competencies in different disciplines, but also positive dispositions towards those disciplines and conscientiousness in addressing problems in those disciplines (Pellegrino, et al. 2013). It was stated that beliefs that students hold about learning can significantly affect learning and performance (e.g. Dweck & Legett, 1988). For example, many students believe on the basis of their typical classroom and homework assignments that they can solve, let's say, math problems in 5 minutes or less, and if this does not happen, they give up, thinking that they do not have talent for mathematics which creates little incentive for them to persist. Conversely, people who believe that they are capable of making sense of unfamiliar things often succeed because they invest more sustained effort in doing so.

Empirical Research on Enhancing 21st Century Skills

A number of studies were conducted on teaching of 21st Century skills. Ananiadou and Claro (2009) explored the teaching and assessment of 21st century skills and competencies in Organisation for Economic Co-operation and Development (OECD) countries. Although all OECD countries were invited to participate in the questionnaire survey, responses were received from seventeen countries/regions. The findings of the study suggested that those countries/regions were covering 21st century skills and competencies in their regulations, guidelines or recommendations for compulsory education. However, there were few specific definitions of these skills and competencies at national or regional level and virtually no clear formative or summative assessment policies for these skills were designed. The only evaluation regarding their teaching seemed to be often left to external inspectors/evaluators as part of their whole school audit

or review. Similarly, it seemed that few teacher training programs targeted the teaching or development of 21st century skills.

Hixson, Ravitz & Whisman (2012) conducted a study to investigate the effect of problem based learning (PBL) implementation on teachers' perceived ability to teach and assess 21st century skills and on student achievement. The overall results provided evidence that PBL use in combination with PBL professional development can have an impact on 21st century skills teaching.

A study by Yeager and Walton (2011) suggested that relatively brief interventions can lead to large and sustained gains in student achievement, as students develop durable, transferable interpersonal skills and apply them to new learning challenges, in positive, self-reinforcing cycle of academic improvement.

Wilson and Linville (1982, 1985) studied a brief intervention designed to change attributions among college freshmen. They brought two groups of struggling freshmen into the laboratory to view videos of upperclassmen discussing their transition to the college. In the videos viewed by the experimental group, upperclassmen said that their grades were low at first, due to transient factors such as a lack of familiarity with the demands of college, but that their grades improved with time. In the videos viewed by the control group, upperclassmen talked about their academic and social interests, but did not mention first-year grades. One year later, students in the treatment group had earned significantly higher grade point averages (0.27 percent higher) than students in the control group, and the effect increased over the following semesters. Ultimately, students in the treatment group were 80 percent less likely to drop out of college than those in the control group.

Blackwell, Trzesniewski, and Dweck (2007) studied an intervention designed to change attributions among low-income minority 7th grade students in an urban school. At the beginning of the school year, the students took part in 8 workshops on brain function and study skills, over 8 weeks. Students in the experimental group were taught that the brain can get stronger when a person works on challenging tasks, while those in the control group learned only study skills. At the end of the academic year, the students in the experimental group earned significantly higher mathematics grades than those in the control group (a mean increase of 0.30 grade points), reversing the normal pattern of declining mathematics grades over the course of seventh grade.

Assessment of 21st Century Skills

The truth is that standardized tests do not seem to be capable of assessing learners' 21st century skills and those skills should be assessed through alternative methods of assessment (e.g. surveys, observations, interviews). And there are no readymade recipes offered first the concepts need to be defined and then measures should be designed in order to assess them. While there is not enough reporting on the actual assessment of 21st century skills, one of the few studies reporting about such an assessment is by Claro, et al. (2012) whose study evaluated fifteen-year-old Chilean students Information and Communication Technology (ICT) skills. The study reported that a performance-based assessment was designed in a virtual environment to measure these skills. The findings suggested that the majority of students were able to solve tasks related to the use of information as consumers, i.e., approximately three quarters of the students were able to search for information and half of them were also able to organize and manage digital information. Another source, Ruiz-Primo (2009) discusses a framework for assessing 21st century skills. This sources can be used to develop instruments that can allow to assess 21st century skills in high school students as well.

Conclusion

As discussed above, several frameworks have been suggested for capturing 21st century skills. 21st century skills were related to deep learning and there is a line of research on the benefits of deep learning for student performance and achievement. Empirical studies on the assessment of 21st century skills are scarce. However, there are sources that could be used to develop measures for assessing 21st century skills in students.

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