21st Century Pedagogy Skills: A Study

Dr. Rashmi Rajak*

* Assistant Professor, Dept. of English, Govt. College, Niwas, Mandala, MP

E-Mail: kanakkhushi02@gmail.com

Abstract:

Preparing students for work, citizenship, and life in the 21st century is not straightforward. Globalization, technology, migration, international competition, changing market conditions, and transnational environmental and political crises have reinvigorated interest in pedagogy and curriculum that will develop the skills and knowledge that are needed for success in the 21st century. Educators, education ministries and governments, philanthropic foundations, employers, and researchers are using various means of naming these skills: including "21st century skills", "higher-order thinking skills", "deeper learning outcomes", and "complex thinking and communication skills". Skills like these are not fresh topics of study for researchers. For more than 40 years, the team of researchers at a variety of foreign and Indian University's Project Zero, have studied what students learn and how techniques for teaching students these skills. In this paper, we turn our focus to what the research tells us about how to teach student's 21st century skills, as well as how the research tells us students develop those skills.

Keywords: 21st century skills, higher-order thinking skills, deeper learning outcomes, and complex thinking and communication skills, etc.

Introduction:

Preparation of students for work, citizenship, and life in the 21st century is more complex than ever. Globalization, technology, migration, international competition, shifting markets, and transnational environmental and political issues create a new urgency to help students develop skill and knowledge for success appropriate to a 21st century context. Educators, education ministries and governments, foundations, employers, and researchers refer to these skills and abilities in various ways, terms such as, "21st century skills," "higher-order thinking skills," "deeper learning outcomes," and "complex thinking and communication

skills." The interest in these skills has always been with us; for more than four decades researchers at several foreign and Indian University's Project Zero have been studying how students learn and how to teach these skills. In this paper, we describe what the research tells us about how students learn 21st century skills and how teachers can teach them effectively.

Despite the consensus that students' expected knowledge and skills in the 21st century differ from those in the past, there is notable variation in terminology across countries, as well as differences in the composition of knowledge, skills, and values that seem to be emphasized. We refer to 21st-century skills because it is the most familiar term and the most commonly used equitable term around the world today. Critics of the term denounce it for being both vague and overused, for endorsing the idea of teaching skills in isolation of knowledge, and for supporting some skills promoted for centuries now promoted with a new and stringent urgency that could lead to rapid and unsuccessful reforms.

Defining 21st Century Skills:

There is no shortage of current definitions of 21st century skills and knowledge. In this paper, we do not seek to provide another or choose one over another. Rather, we share two well-known examples and pull out several common themes. In a frequently cited example, the University of Melbourne–based and Cisco-, Intel-, and Microsoft-funded Assessment and Teaching of 21st Century Skills (AT21CS) consortium — which includes Australia, Finland, Portugal, Singapore, the United Kingdom, and the United States — organizes 21st century skills, knowledge, and attitudes, values, and ethics into the following four categories:

Modes of Thinking:

Thinking creatively and innovatively, thinking critically, thinking in a problem-solving way, thinking in a decision-making way, and learning how to learn (or metacognition)

Modes of Working: communicating and working in teams

Tools for Working: having information and communication technology (ICT) literacy and general knowledge.

Living in the World: citizenship, life and career, and personal and social responsibility (including intercultural understanding and competence). Another definition is given by Tony

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Wagner (2008), co-director of the Harvard Change Leadership Group, in his book, The Global Achievement Gap. Based on several hundreds of interviews with leaders in business, nonprofits, and education, Wagner suggests that students must develop seven survival skills to be successful in the 21st century consequences of life, work, and citizenship:

1. Critical Thinking and Problem-Solving

2. Collaboration and Leadership

3. Agility and Adaptability

4. Initiative and Entrepreneurship

5. Effective Oral and Written Communication

6. Accessing and Analyzing Information

7. Curiosity and Imagination

The definitions of 21st century skills transcend disciplines and describe facets of contemporary life in an increasingly complicated world. Moreover, these skills do not make their way into many curriculum guides. Most lists, for example, are not lists that consist solely of skills. They include aspects of skills and understandings, but many of them also are focused on inclinations that are not skills strictly speaking, such as curiosity, creativity, and collaboration. Some lists highlight technology and others appear to place more emphasis on attitudes and values. However, in all lists, the emphasis is on these types of thinking, learning and communication skills that require much more cognitively from students than simply memorizing facts and other rote skills.

The Need for 21st Century Skills Among Students:

There are strong economic and civic arguments for education systems to graduates students with skills for the 21st century. The economic argument uses the fact that machines and computers perform an increasing amount of the kinds of jobs which once required people with only regular or routine knowledge and skill levels. This implies that the workplace will require less people with "basic" skill levels and more people who possess higher-order thinking skills and can adapt and apply that skill appropriately to levels of complexity within processes

involving problem-solving skills. Additionally, the supply and demand for people with greater skill levels requires that, not just in the United States but across the globe, there is increasing competition for job opportunities for individuals who possess not just routine-like skills but rather non-routine skills involving complex thinking and multi-layered communication.

Globalization represents the third rationale for teaching and learning 21st century skills. The fact that people migrate globally, have the Internet, can hop on a flight to the other side of the world, interact in the world market economy, experience climate instability, countries engage in war, etc., has begun to condition us to remember each day that countries, states, and individuals are engaged in a global economy, ecology, and political society, and that individuals are members of a global community. This interconnectedness makes it far more urgent for students across the globe to learn how to communicate, collaborate, and solve problems with individuals, groups, and communities beyond the borders of nations. Each of these three rationales motivates the need for 21st century skills based on a different perspective, but they are not mutually exclusive. They build and support each other. In fact, the skills and knowledge needed to participate in the economic, civic, and global spheres, intersect nearly completely. Skills and knowledge of 21st century skills are needed to engage citizens in exercising their rights and responsibilities in the societies they are a part of.

Learning through a discipline:

This includes learning not only about the discipline, but about the skills related to knowledge production inside of the discipline. In order to learn that disciplinary curriculum and instruction should teach students the importance of the discipline, how experts produce new knowledge, and how they communicate their new knowledge. Each of these steps aligns closely to developing 21st century skills and knowledge.33 For example, through scientific study, a student should learn about the importance of science, what kinds of problems they can solve with it, how they scientists design studies and experiments, and how scientists conclude what they learn, what they do with thier knowledge, and how they disseminate their studies and experimental results. Informed by this perspective and effort to promote students' enthusiasm for science, technology, engineering and mathematics studies, Japan's Zest for Living reform legislation increased emphasis on science and mathematics curriculum that included foundational study processes such as those above.

In line with this, students should be able to ask a problem based upon their engagement with the historical knowledge base of a topic through the study of history. In order to develop an answer to the problem they have established in history, students need to gather, sift, and synthesize information from oral, written, and visual primary and secondary sources. Students will need to know where to look for information, what information will help them to build an argument, and how to interpret information they find, how to organize complex cause to effect relationship, to take into consideration biases on the part of a source, and then how these studies and conclusions match up with what has been conveyed to be fact historically. They also learn how to discuss (or communicate) these findings, and they practice to a variety of audiences.

Any field of learning typically requires that the student - or a learning expert for educational purposes - be able to become informed about, and have a good command of, a knowledge base for said field, know how to apply the knowledge base, be able to articulate a problem, apply critical thinking to solve it, and communicate their findings in sophisticated ways. This means, in effect, that becoming a master in the field implies use of many 21st century skills for students. Other 21st century skills, such as leadership, adaptability, and initiative, can be grown in other areas through the disciplines, when teachers specifically identify those as objectives and provide ways for the students to develop these skills. For example, teachers might plan activities that have students practicing rotating leadership in groups, tutor younger students, or engage with their neighborhoods. In these instances, and explicitly talk about these leadership properties, the students develop their own conceptual understanding of leadership and put that learning into practice.

Lower- and Higher-Order Thinking Skills:

We describe the rationale for having students learn 21st century skills through disciplinary study. In a similar manner, students can - and should - develop lower- and higher-order thinking skills simultaneously. For example, students might engage in lower-order skills by plugging numbers into an equation, such as $E = MC2$, as a way to grasp the idea of mass and energy relationship. To further understand that relationship, a teacher could engage students with higher-order questions that require higher-order thinking challenges. Schwartz and Fischer (2006) listed several example questions, such as If mass is used in the formula rather than weight, what can I use to determine mass? Can I use my bathroom scale? Why or

why not? Although students might find it ignorable to put numbers in piece, answering the questions becomes very entitled. Nonetheless, successfully addressing these questions, which are now much more difficult, lead to a more flexible and useable understanding.

Lower-order tasks:

These are quite prevalent in current curriculums, while higher-order thinking tasks are minimally present.38 Higher-order thinking tends to be challenging for children to learn and demonstrate because it requires children to understand the relationship among variables (lower-order thinking) and how to apply or transfer that understanding to a new, unfamiliar context (e.g., higher-order thinking). Transfer (which we discuss in more detail in subsequent sections) tends to be, for most people, to be very difficult. However, applying new understandings to a new, unfamiliar context is what children need to be able to do to successfully navigate the demands of the current, 21st century.

Skills for higher order thinking:

Developing these skills takes time, and teaching them typically means that teachers have to exchange depth for breadth. Singapore's national educational success supports this exchange: With its Teach Less, Learn More educational reform, teachers teach and cover much less material than teachers in many countries, but they teach in significantly more depth so students will understand lower- and higher-order concepts. Another approach that is becoming popular in Finland and Singapore, is the reversal of the way that students engage during the school day and the time they engage with homework at home. Rather than listening to a lecture at school and practicing problems at home, students can read content for homework, and then at school, work collaboratively making sense of problems while the teacher engages them with questions and coaches them explicitly on how to develop higher-order thinking.

Instruct Students to Master the Learning Process:

There is a limit to how many skills, attitudes, and dispositions students can learn in the confines of their formal schooling. Therefore, to educate them for the 21st century, we need to educate them on how to learn on their own. To accomplish this, students must have some awareness of how they learn. While this notion has a long history, it was Flavell who coined the modern label metacognition in 1976 to describe learning to learn and defines it as one's

knowledge concerning one's own cognitive processes or anything related to it. For example, Flavell (1976) iscussed the importance of metacognition in relation to problem solving. I am engaging in metacognition whether or not, I notice that I have more trouble learning A than B; if it occurs to me that I should check C before I - accept it as fact.

Learning to Learn is not just an important skill in its own right; it also engages students to learn skills, knowledge, strategies, and attitudes more effectively, when activities develop metacognition. A study of 79 Swiss eighth grade classrooms, including video recordings, student and teacher surveys, and student achievement, found a positive relationship between metacognition and student achievement on the Third International Mathematics and Science Study.50 In Finland, starting in first grade, teachers focus on metacognition development. Students identify their educational goals and reflect on their learning progress. The goal of this initiative is...... to stimulate pupils' curiosity and motivation to learn math, promote activeness, self-direction and creativity by presenting engaging challenges and problems." In Hong Kong, as part of the 2000 Learning to Learn initiative, which is appropriately named, teachers are developing metacognition strategies for their teaching practice. (Luk-Fong & Brennan 2010)

Utilize Technology to Encourage Learning:

Technology has the ability to give students new opportunities to build their problem solving, critical thinking, and communication skills; transfer those skills to new situations; reflect on their thinking and that of their peers; practice fixing their misunderstandings; and work with peers — all while focused on topics relevant to the students' lives and utilizing interesting tools. The River City Multi User Virtual Environment (MUVE) project illustrates a type of educational, technology-based pedagogical product that aims to achieve each of these goals. Although the program "has the look and feel of a video game," it is grounded in U.S. national standards in biology and ecology. Students engage in a 19th century virtual environment in which they learn to think and act like health scientists in order to better understand why some people are becoming ill. They engage in collaborative problem identification with their online contemporaries, collaboratively construct and test hypotheses, and identify answer(s) as they explain the underlying causes. There are many other similar web-based forums in which students can engage with their peers from different parts of the world to learn, share, and debate. For example, in a program called Deliberating in a

Democracy, students from Colombia, Ecuador, Mexico, Peru, and the United States share their thinking and opinions with international peers on a wide range of topics from corruption and judicial independence to the environment to public health, and then vote on different policy options.

The Internet itself is also a venue for students to develop 21st century skills and knowledge. Given the nature of the plethora of sources available on the Internet, many of which offer varying amounts of information and/or have significant source bias, students can learn to evaluate sources for reliability and authenticity. It allows them to filter in information from credible sources while eliminating information from questionable sources. Once students learn where to find acceptable information, they can leverage the Internet as a reference source in many areas.

Apart from its potential for instruction, technology can also impact education in other ways. Teachers can utilize it to develop and share best practices. For example, the Ontario Ministry of Education established the e-Learning Ontario website to "find, post, and share example resources and practices for instruction and professional learning in an interactive platform." Similarly, teachers from Singapore use the Networked Learning Communities, and student teachers from Shanghai use Teaching and Learning e-Portfolios, to use their pedagogical, content, and experience-based understanding of learning to develop teacher-driven practices. Technology also allows for greater opportunities to use student data for formative and summative purposes, and to assess students' understanding in ways that capitalize on MUVE environments or artificial intelligence. We address the assessment theme below.

There is widespread agreement that technology has a strong potential for education. It has not yet fulfilled this potential in part due to teachers not having the opportunity to learn to leverage its pedagogical value. Without direction, teachers often use technology to simulate the transmission model. Assuming that students are utilizing technology to engage in listening to lectures, reading text, and repeating back to their teachers, they are experiencing all of the problems that have been discussed throughout this paper (it should be noted that an electronic version of the transmission model at least minimally helps students get comfortable with hardware and software of the computer, which is a 21st-century necessity in itself.

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Conclusion:

To sum up, the study above, discussed the significance of 21st century skills and summarized the learning sciences research on optimal ways to teach and evaluate those skills, as well as how to improve the ease with which schools' systems will be able to implement that work because they have readily available human capital. While there is some momentum for that work, the work remaining will be challenging and complex, using the type of skills that we are considering important for the next generation. If we truly believe that developing students' 21st century skills is integral to addressing economic, civic, and global challenges, and being productive citizens in those areas, then we need to act on the believes that we can use those skills to disrupt our current education systems.

References:

- Flavell, J. H. (1976). Metacognitive aspects of problem solving. In L. B. Resnick (Ed.), The nature of intelligence (pp. 231–236). Hillsdale, NJ: Lawrence Erlbaum Associates.

- Luk-Fong, P., & Brennan, M. (2010). Teachers' experience of secondary education reform in Hong Kong. International Journal of Educational Reform, 19(2), 128–153.

- RAND Corporation. (2012, April). Teaching and learning 21st century skills: Lessons from the learning sciences. RAND Corporation.

- Wagner, T. (2008). The global achievement gap: Why even our best schools don't teach the new survival skills our children need—and what we can do about it. New York, NY: Basic Books.