

## TEACHERS ENGAGEMENT AND STUDENT INTERACTIONS FOR SUPPORTTING 21<sup>st</sup> CENTURY SKILLS

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### Abstract:

*This is an exciting and challenging time for teacher educators. The nature of teaching is changing. To transform themselves into exemplary educator preparation institutions, many programs are becoming more entrepreneurial, recognizing new opportunities and making changes required to respond to the needs of 21st century learners. Engage prospective teachers in creating instruction aligned with their state's curriculum standards, effectively interpreting assessment results, responding to students' learning needs, and cultivating a passion for learning that will support students for a lifetime, and Meet the demands of the global economy by exemplifying, and embedding in instruction, the mastery of 21st century skills such as critical thinking, problem-solving, communication, collaboration and creativity and innovation. This includes the application of technology to support more robust instructional methods and understanding the relationship between content, pedagogy, and technology through dissemination of Technological Pedagogical Content Knowledge (TPCK) theory and research. The purpose of this paper is to create the foundation for ongoing dialogue around how 21<sup>st</sup> century knowledge and skills could be appropriately embedded in educator preparation, and to guide the development of resources and services to support educator programs. Today as never before, meeting our society's challenges demands educational excellence. Reinvigorating the economy, achieving energy independence with alternative technologies and green jobs, and strengthening our health care system require a skilled populace that is ready for the critical challenges we face. There is widespread consensus, however, that our education systems are failing to adequately prepare all students with the essential 21st century knowledge and skills necessary to succeed in life, career and citizenship. The benefactors are teachers, administrators.*

**Keywords:** Engagement, International, Support and 21<sup>st</sup> Century skills.

### Introduction:

Twenty-first-century learning means that students master content while producing, synthesizing, and evaluating information from a wide variety of subjects and sources with an understanding of and respect for diverse cultures. Students demonstrate the three Rs, but also the three Cs: creativity, communication, and collaboration. They demonstrate digital literacy as well as civic responsibility. Virtual tools and open-source software create borderless learning territories for students of all ages, anytime and anywhere (Ainley & Gebhart, 2016). As evidenced by the study referenced in Forbes, 21st century skills have never been more imperative to ensuring young people's safety and success. They are also essential to the modern

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workplace. While a student may be able to get through high school on memorization, jobs do not work that way. According to a 2012 survey of 704 employers conducted by The Chronicle of Higher Education and American Public Media's Marketplace, half of those surveyed said they had trouble finding recent graduates to fill vacancies in their companies; even though applicants had the technical prowess, they lacked the communication, adaptability, decision-making, and problem-solving skills needed to do the job. This survey reflects the growing divide between the skills employers are seeking and applicants' abilities. It is almost universally acknowledged that in order to succeed in the 21st century, students must learn much more than the "three Rs" and basic computer competency (Akram & Zepeda, 2015). The term "21st century skills" is used often in educational circles to refer to a range of abilities and competencies that go beyond what has traditionally been taught in the classroom, including problem solving, communication, collaboration, creativity and innovation. Others define the term as "information literacy, media literacy, and information, communication and technology literacy." Twenty-first century skills are not a new concept, and even though students' success in classrooms and in the workforce requires that their educational experiences both reflect our current digital world and equip them to engage with it (and even setting aside the debate about the precise definition of the term), too many students are falling short. Students can "work" the Internet and digital applications for entertainment or to glean basic information for a project; worryingly few, understand the building blocks of our digital world and how to manipulate them and avoid, in turn, being manipulated (Bybee, 2013).

#### **Review of Literature:**

The deeper thinking and discovery that characterize 21st century skills are not just for people in wealthy school districts or the college-bound. This skill set is critical for all people who hope to participate productively in the workforce. More importantly, students need these skills because employers across a huge variety of industries increasingly demand them. A recent McKinsey report indicated that close to 40 percent of employers could not find people with the right skills while 60 percent "complained of a lack of preparation." Even jobs that were once considered vocational, such as welding, petroleum production, and even factory work, are now high tech, and require specialized knowledge that includes not only a robust science background and familiarity with the computerized machinery that keeps heavy industry humming, but also critical thinking and collaboration skills (Carpenter & Pease, 2013).

The examples above were laudable efforts to embed technology more deeply in schools and in learning, yet they present two problems: first, they are one-sided, focusing largely on the tech at the expense of teaching the equally critical social skills that comprise 21st century skills. Second, they often represent single-institution efforts, rather than the collective impact model we know bear's fruit. It was heartening to see education-focused incubators and accelerators (e.g., Penn GSE's EDSi, the University of Virginia's Education Accelerator) increasingly adopting new models that place greater emphasis on bringing together critical participants such as faculty, students, classroom practitioners, and business leaders, yet the gap in communication presents a persistent barrier to the teaching of true 21st century skills (Carroll, 2015).

The researcher has already recognized that teaching 21st century skills was not just about flinging more ideas or more tablets or more smartboards at schools and students. This was indeed progress, but we could jump start progress by bringing more, and better, ideas to market. This would happen when we have developed and iterate on new and better mechanisms that leverage available technologies even as they build and sustain meaningful dialogue among relevant constituents in the community. As the people have previously written as part of our definition of an edtech innovation ecosystem, they believe that the way to get better ideas was not just to ask one set of stakeholders their opinion about what might work well. Instead, better

ideas require efforts to engage many stakeholders in an ongoing conversation about our fast-changing world and about what skills and competencies students will need to stake their claim to a place in the world (Eisenhart & Cipollone, 2015).

Twenty-first-century learning embodies an approach to teaching that marries content to skill. Without skills, students were left to memorize facts, recall details for worksheets, and relegate their educational experience to passivity. Without content, students may engage in problem-solving or team-working experiences that fall into triviality, into relevance without rigor. Instead, the 21st-century learning paradigm offers an opportunity to synergize the margins of the content vs. skills debate and bring it into a framework that dispels these dichotomies. Twenty-first-century learning means hearkening to cornerstones of the past to help us navigate our future. Embracing a 21st-century learning model requires consideration of those elements that could comprise such a shift: creating learners who take intellectual risks, fostering learning dispositions, and nurturing school communities where everyone is a learner (Chinn & Malhortra, 2002).

Success in the 21st century requires knowing how to learn. Students today would likely have several careers in their lifetime. They must develop strong critical thinking and interpersonal communication skills in order to be successful in an increasingly fluid, interconnected, and complex world. Technology allows for 24/7 access to information, constant social interaction, and easily created and shared digital content. In this setting, educators can leverage technology to create an engaging and personalized environment to meet the emerging educational needs of this generation. No longer does learning have to be one-size-fits-all or confined to the classroom. The opportunities afforded by technology should be used to re-imagine 21st-century education, focusing on preparing students to be learners for life (Claro & Nussbaun, 2012).

Twenty-first-century learning must include the 20th-century ideals of *Brown v. Board of Education*. Sadly, they have failed to deliver on that promise. Our system perpetuates a racial and socioeconomic achievement gap that undermines our ideals of freedom, equality, and opportunity. As we study what distinguishes highly effective teachers in our nation's most challenging contexts, we see that education reform requires much more than lists of skills. They have needed classroom leaders setting an ambitious vision, rallying others to work hard to achieve it, planning and executing to ensure student learning, and defining the very notion of teaching as changing the life paths of students. What would make America a global leader in the 21st century is acting on what we know to educate all children, regardless of socioeconomic background (Zimmerman, 1998).

Twenty-first-century learning would ultimately be "learner-driven." Our old stories of education (factory-model, top-down, compliance-driven) are breaking down or broken, and this is because the Internet is releasing intellectual energy that comes from our latent desires as human beings to have a voice, to create, and to participate. The knowledge-based results look a lot like free-market economies or democratic governments. Loosely governed and highly self-directed, these teaching and learning activities exist beyond the sanction or control of formal educational institutions. The researcher has believed the political and institutional responses would be to continue to promote stories about education that are highly-structured and defined from above, like national standards the teaching of 21st-century skills. Those would, however, seem increasingly out-of-sync not just with parents, educators, and administrators watching the Internet Revolution, but with students, who themselves are largely prepared to drive their own educations (Behrend & Lynch, 2016).

To be prepared for the 21st century, our children require the following skills and knowledge: an understanding of history, civics, geography, mathematics, and science, so they may comprehend unforeseen events and act wisely; the ability to speak, write, and read English well; mastery of a foreign language; engagement in the arts, to enrich their lives; close

encounters with great literature, to gain insight into timeless dilemmas and the human condition; a love of learning, so they continue to develop their minds when their formal schooling ends; self-discipline, to pursue their goals to completion; ethical and moral character; the social skills to collaborate fruitfully with others; the ability to use technology wisely; the ability to make and repair useful objects, for personal independence; and the ability to play a musical instrument, for personal satisfaction (Brown & Campione, 1983).

Adaptability, complex communication skills, non-routine problem solving, self-management, and systems-thinking are essential skills in the 21st-century workforce. From the researcher perspective as a scientist and science educator, the most effective way to prepare students for the workforce and college is to implement and scale what is already known about effective learning and teaching. Content vs. process wars should be ancient history, based on the evidence from the learning sciences. Integrating core concepts with key skills would prepare students for the workplace and college. They need to move past mile-wide and inch-deep coverage of ever-expanding content in the classroom. Developing skills in the context of core concepts was simply good practice. It was time to let go of polarizing debates, consider the evidence, and get to work (Boekaerts, 2016).

### Methodology:

This study was designed as a quantitative method of approach (Tashakkori & Teddlie, 2003). Document analysis was used as a tool to identify occasions of evidence within lessons plans and student work products related to the identified 21st Century skills (Krippendorff, 2012). The data were checked for normality, Skewness and outliers, only the teacher lesson plans met all assumption for an ANOVA. The 50 higher secondary school teachers were used for the studies as sample size. Each teacher lesson plan was analyzed using the 21st Century Learning Design (21CLD) Learning Activity Rubric and each student work product was analyzed using the 21st Century Learning Design Student Work Rubric. These instruments were found to be valid and reliable for use in high school classrooms, and Shear et al., 2010 reports the details of the development and validation of the rubrics.

### Findings & Discussion:

The finding and the discussion were detailed below the table. Although the student work products were related to the teacher lesson plans, they were analyzed independently according to the protocol of the 21CLD rubrics. The rubric defined long-term as “if students work on it for a substantive period of time.”

Table:1 Average rubric scores for lesson plans

Rubrics metrics	Short-term		Long-term		Total	
	Mean	SD	Mean	SD	Mean	SD
Knowledge	1.59	.79	2.37	1.36	1.86	1.38
Real-world problem	1.40	.53	1.91	1.25	1.59	0.86
Skilled-Communication	1.39	.42	2.38	1.00	1.66	.87
Collaboration	1.51	.56	1.77	1.28	1.85	1.20
Self-regulation	1.20	.44	2.23	1.04	1.65	0.88

To answer the research question, a descriptive analysis was run for each of the five categories on the rubric and the total score (found in table-1). The average score for all teacher lesson plans was less than 2 for all five categories. Likewise, overall student work sample averages scored below 2 except on the category of self-regulation Construction. Table 1 also shows the mean score for long-term student work sample categories to better describe central tendencies

of the data. The other construction of skilled-communication mean value was also 1.39 to comparing others but others mean values were standard form.

### **Conclusion:**

This study confirmed the presence of all identified 21st Century skills in the lesson plans at the selected exemplar ISHSs serving underrepresented students in STEM: (a) knowledge construction, (b) real-world problem solving, (c) skilled communication, (d) collaboration, (e) use of information and communication technology (ICT) for learning, and (f) self-regulation. Considering the patterns that emerged from the rubrics, the researcher posits that in the lesson plans communication and collaboration are the core 21st Century skills that facilitate knowledge construction and real-world problem solving, while student self-regulation creates efficiencies resulting in improved knowledge construction and real-world problem solving. They also saw in the lesson plans that ICT provides tools to support communication and reflection which leads to knowledge construction and real-world problem solving. Students need time to grapple with and learn new skills (Lynch et al., 2017; NGSS Lead States, 2013). There is a desire to better understand how ISHSs successfully develop these skills. This includes how schools incorporate and build the 21st Century skills (a) within multiple lessons in one course, (b) across multiple classes over the course of a school year, and (c) throughout the students' entire high school sequence.

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