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THE LEARNER

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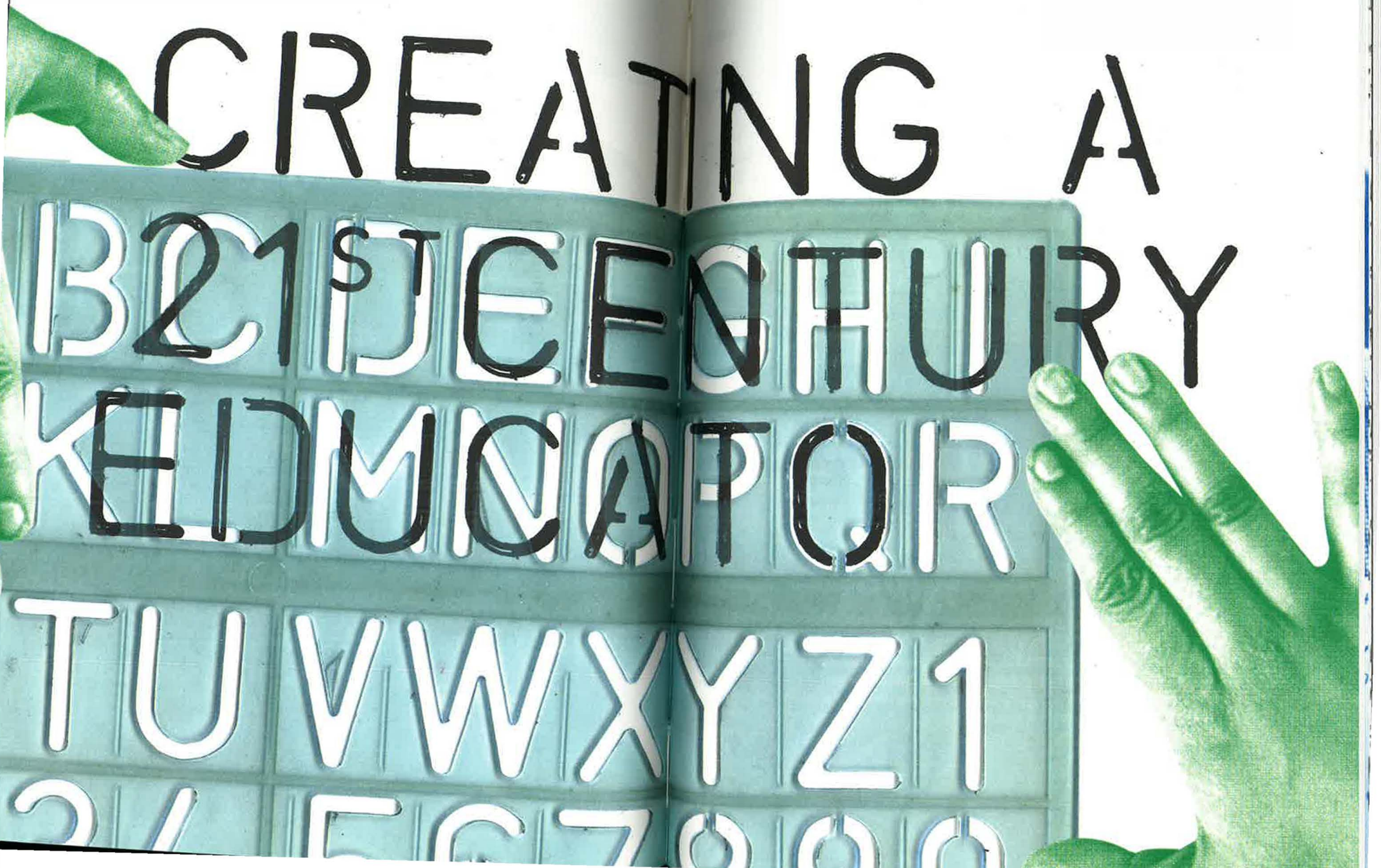
Dr. Punya Mishra, *Associate Dean & Professor*; Arizona State University,
& Rohit Mehta, *PhD Candidate, Michigan State University*

CREATING A 21ST CENTURY EDUCATOR



This article is adapted from the 2013 paper *What knowledge is of most worth: Teacher knowledge for 21st Century learning* by Kristen Kereluik, Punya Mishra, Chris Fahnoe, and Laura Terry, published in *Journal of Digital Learning in Teacher Education*. Available at: punyamishra.com

Herbert Spencer, an English philosopher, asked a question over 100 years ago, in an essay titled 'What knowledge is of most worth?' Of course this question resonates even today, though the context within which it is asked has changed dramatically. It has been argued that in the world we live in today, transformed as it is by the forces of globalization and rapid advances in technology — requires new kinds of learning and new forms of knowledge for student success. Scholars across the spectrum (from Cuban to Zhao) have argued that current approaches to educating our youth have been largely unsuccessful in preparing students for the changes and challenges of the future. Schooling, according to this perspective, has remained impervious in many ways to the changes that have occurred in the world due to the knowledge economy. In addition, new technologies, such as the Internet, offer dramatically and potentially transformational opportunities for teaching and learning. As Joel Rose (2012), co-founder and CEO of New Classrooms Innovation Partners, wrote in an article in The Atlantic, 'The Information Age has facilitated a reinvention of nearly every industry except for education.'

See Looking Within to go Beyond, page 28.

In order to provide a better understanding of what is worth knowing for today's students, we conducted a study of 'expert' perspectives to answer this question. We analyzed 15 key documents (complete list available at punyamishra.com) from the literature on 21st Century knowledge frameworks, and — through that analysis — developed a set of overarching categories to offer a coherent integrative framework of what teaching and learning mean in the 21st Century. We call this the 3 x 3 model of 21st Century learning. In this article we briefly describe this model and some implications for educators as we seek to create better learning environments for our students.

THE 3 x 3 MODEL OF 21ST CENTURY LEARNING

Our analysis of 15 key documents related to 21st Century learning indicated a convergence onto nine key domains — which in turn could be seen as falling under three broad categories (see right). The three broad categories are: *Foundational Knowledge, Meta Knowledge,* and *Humanistic Knowledge.* Each category represented a different realm of knowledge as seen in the figure opposite. Each of these over-arching categories and the subcategories are described in greater detail overleaf.

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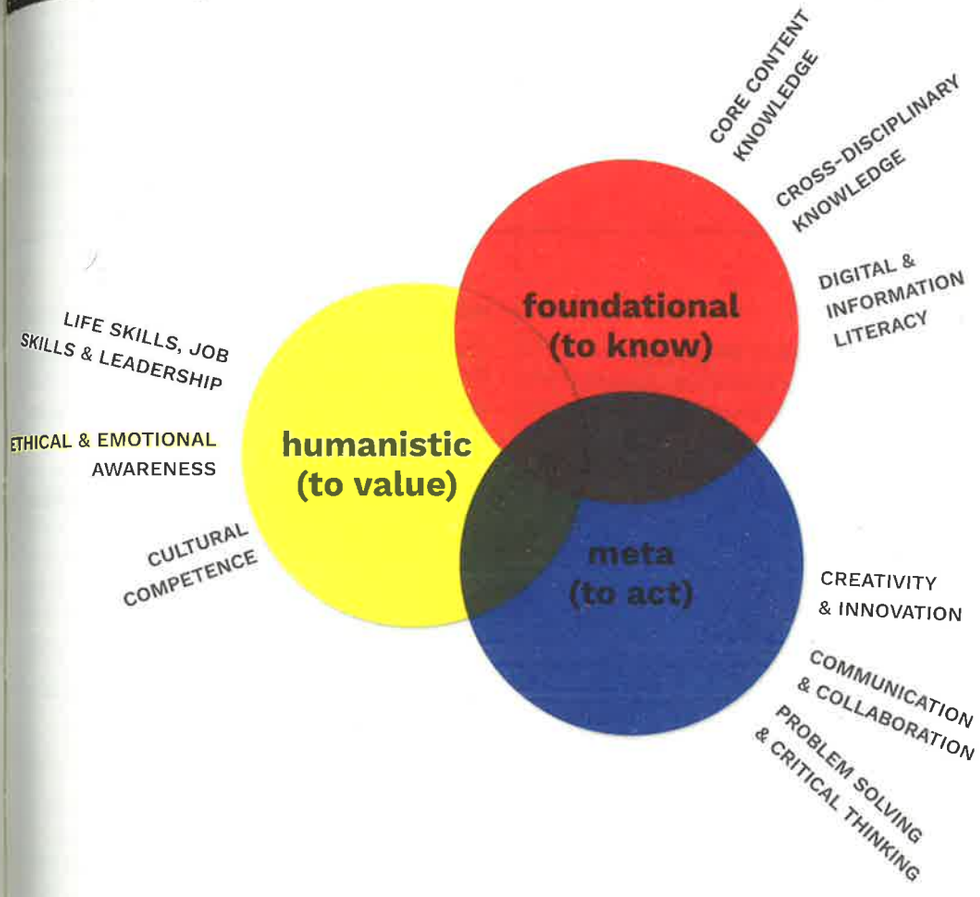


KNOWLEDGE

Foundational

This category is the answer to the 'what' question, i.e., 'What do students need to know?' The frameworks reviewed saw this in terms of three key sub-categories: *core content knowledge, digital literacy,* and *cross-disciplinary knowledge.*

Core Content Knowledge

Core content knowledge and disciplined ways of thinking are characterized by highly complex and deeply ingrained mental processes specific to traditional domains, such as applying mathematical ways of thinking to solve everyday problems or applying scientific ways of thinking to understanding the natural world. Excellence in traditional academic domains such as English and mathematics were considered to be the foundations upon which other 21st Century skills are to be developed.

Digital & Information Literacy

Digital and information literacy, like core content knowledge, was often cited as a skill necessary for success in the 21st Century. It can be defined as the ability to effectively and thoughtfully evaluate, navigate and construct information using a range of digital technologies, and thus to function fluently in a digital world. An important part of this is the ability to effectively seek out, organize and process information from a variety of media. This form of literacy also includes a component of responsible use of technology and media, an important moral and ethical consideration beyond understanding basic ICT systems and media forms.

Cross-Disciplinary Knowledge

Cross-disciplinary knowledge is knowledge that integrates and synthesizes information from across fields or domains such as the application of knowledge to new contexts in the pursuit of specific end goals. Synthesis can be related to both constructing meaning (i.e. making sense of different domains and their relationships) and to the generation of new ideas (i.e. trans-disciplinary creativity). It also involves the ability to understand, organize and connect the vast amounts of information now available with the advent of digital media.

Meta

This category was about knowledge of the process of working with foundational knowledge. This could also be seen in terms of three sub-categories: *problem solving & critical thinking, communication & collaboration,* and *creativity & innovation.*

Problem Solving & Critical Thinking

Critical thinking frequently involves the ability to interpret information and make informed decisions based on such information. Problem solving is often conceptualized as the use of critical thinking skills towards the effective resolution of a specific problem or towards a specific end goal.

Communication & Collaboration

Communication involves the ability to clearly articulate oneself through all mediums of communication: oral, written, non-verbal, and digital, as well as the skills necessary to be an active and respectful listener to diverse audiences. Collaboration includes similar dimensions as communication, but also includes important individual contributions such as flexibility, willingness to participate, and recognition of group and individual efforts and successes.

Creativity & Innovation

Creativity appeared among the most often cited skills as necessary for success in the 21st Century. Creativity and innovation involves applying a wide range of knowledge and skills in the generation of novel and worthwhile products (tangible or intangible) as well as the ability to evaluate, elaborate, and refine ideas and products.

Humanistic

This form of knowledge offers a vision of the learner's self and its location in a broader social and global context. The three main sub-categories that emerged under this broader rubric are: *life/job skills & leadership, cultural competence,* and *ethical/emotional awareness.*

Life Skills, Job Skills & Leadership

Life skills, job skills and leadership are those that serve to create lifelong learners, capable of success beyond the confines of the classroom, including aspects of personal and professional leadership. Job and life skills serve to effectively manage and organize one's efforts, those that serve to coordinate and organize relevant and important information, and those that serve in the development of end products (tangible and intangible) in the pursuit of the resolution of specific solutions to relevant problems.

Cultural Competence

Cultural competence also includes aspects of personal, interpersonal, and inter-cultural competence evidenced through effective communication and collaboration, and appreciation of ideas and emotions of all types of individuals. Cultural competence, like ethical awareness, is thought to be essential for social and economic success as a result of increased cultural diversity from globalization.

Ethical & Emotional Awareness

Ethical awareness included the knowledge and skills necessary for success in a culturally diverse society, such as the ability to imagine oneself in someone else's position and feel with that individual, as well as the ability to engage in ethical decision making. It also includes the ability to intuit the feelings of others, as well as a deep understanding of human emotions and successful human interactions.

In summary, we say that our review of 15 of the most significant 21st Century knowledge frameworks has led to new conclusions and a new categorization of three overarching categories with three corresponding sub-categories. It is also clear that each of these major categories can be seen as being what we need to know; how we act on that knowledge; and the values we bring to our knowledge and action. It is important to note that these three categories (with three sub-categories) do not function as discrete categories of knowledge but as complimentary categories that support and inform one another.

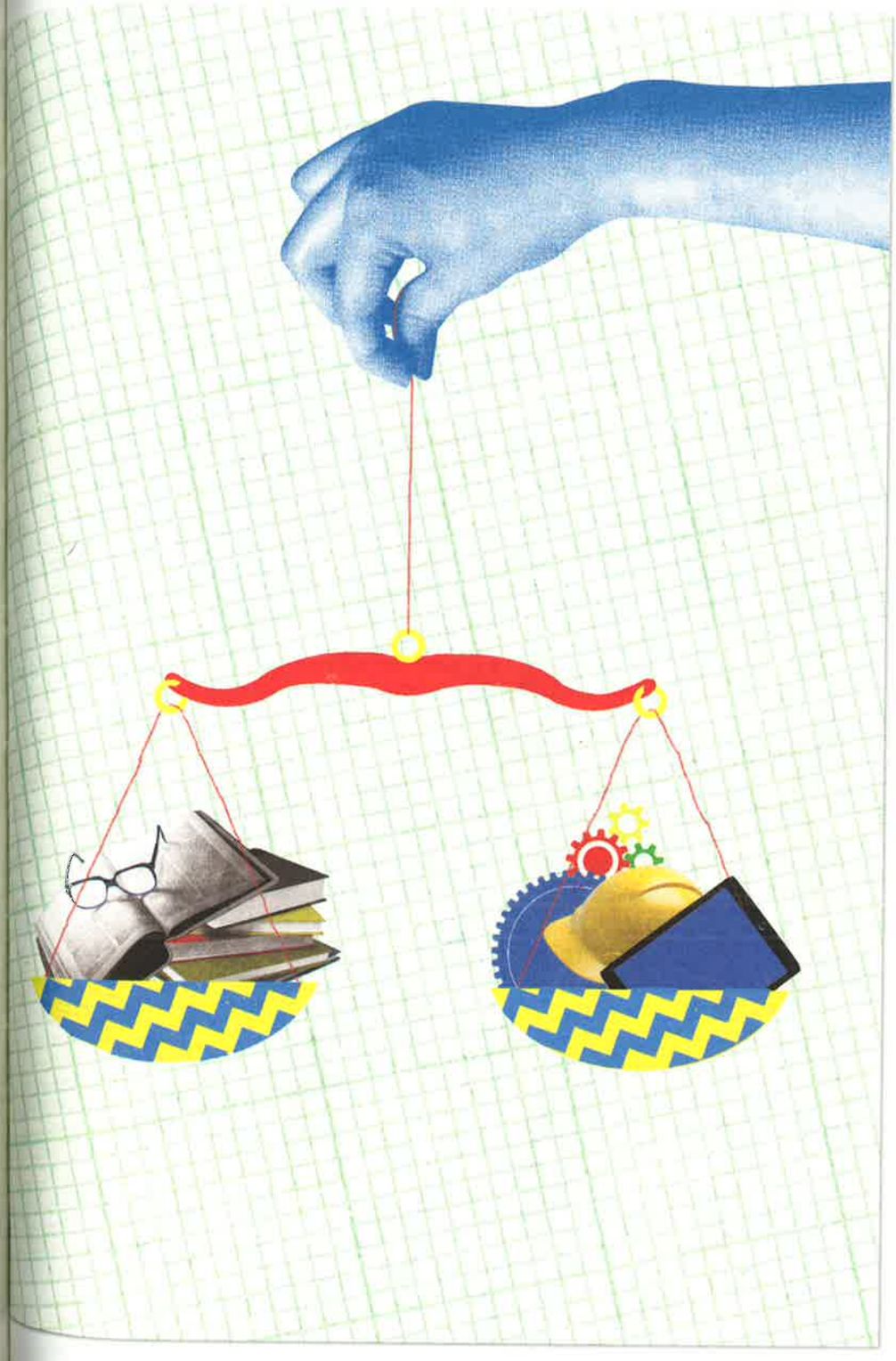
Given this synthesis of expert views, an important question that emerges is, how does it compare with the practitioners' view on the ground? Despite what the experts say and believe, the actual implementation of new approaches to teaching and learning in today's schools and classrooms will be determined by the beliefs and knowledge of the practitioners themselves. To answer this question, we developed and implemented a survey to compare the practitioner mindset with that of the experts, inquiring their views on the skills and challenges facing them in the 21st Century (Mishra & Mehta, 2016).

See Unlearning to Learn, page 84

Teachers and practitioners noted challenges that were associated mostly with humanistic knowledge (44%), followed by foundational knowledge (32%) and meta knowledge (9%). In terms of skills that they found to be most important, almost 21% of the important skills focused on Digital/ICT literacy (foundational knowledge). The second highest set of skills were focused on communication and collaboration (meta knowledge) at 12%, closely followed by problem solving (meta) at 11%. The least frequently occurring skills were creativity/innovation (3.3%) (meta) and life and job skills (4%) (humanistic knowledge). Overall, on a scale of 1 (least important) to 9 (most important), meta knowledge was rated to be the most important in 21st Century learning by the participants, followed by humanistic knowledge, and finally foundational knowledge, which was rated the least important.

See Learning Together, page 51.

Based on the two studies, our analysis indicates a paradox in how we think about knowledge in the 21st Century. On the one hand, this synthesis is consistent with past approaches toward teaching and learning, suggesting that, at some level, nothing really changed. That is, not all the knowledge and skills



represented in these 21st Century frameworks are unique to this century. The world of the future will continue to depend on specialized knowledge (or domain knowledge) and high-level cognitive skills (such as creativity and critical thinking). These skills, rather than being novel to the 21st Century, are skills that are required for successful learning and achievement in any time, including but not limited to the 21st Century. Additionally, interpersonal skills (such as life-skills, leadership, and cultural competence) have also been important in the past, and will continue to be in the future.

On the other hand, our framework suggests that, though the overarching knowledge bases that are required may not have changed, the specifics of how these ideas are instantiated in learning contexts may have changed. This is particularly due to changes in technology, and the pressures of globalization. We do not go into the ramifications of each of these categories due to reasons of space (interested readers can go to the first author's website).

This framework provides us with some specific recommendations for teachers and teacher educators. In brief, we point to four key suggestions.

IMPLICATIONS FOR TEACHERS

1. Disciplinary knowledge and domain knowledge are as important as ever, and will continue to be so well into the foreseeable future. Educational systems remain fundamentally based on disciplinary knowledge and as such require teachers adequately trained, and proficient in the disciplines.

2. Knowing the technology is important, but knowing when to use technology and why to use technology is more important. Knowing when to use a particular technology for activities such as collaboration, or why to use a certain technology for acquiring specific disciplinary knowledge is a vastly more important, transferable, infinitely relevant type of knowledge, one that will not quickly become antiquated with ever-changing technological trends.

EDUCATORS

3. Technological advances of the 21st Century have brought us closer together, and at the same time, further apart. Advances to technology and infrastructure have made physical proximity optional, not only in education but in fields like business and medicine as well, and made availability for interaction effortless. As a result of the increased opportunity for interaction, across countries and around the world, teachers need to know how to foster cultural competence, emotional awareness, and leadership skills, to foster not only interactions, but meaningful relationships.

4. Though this framework does not directly speak to teaching and learning and the role of the teacher, it does indicate that these changes in technology can allow for greater personalization of learning, as well as some shifts in the traditional hierarchical relationships that are the standard in today's learning contexts. The fact that teachers have a greater responsibility to cover a range of areas — what students know, how they act on that knowledge, and the values that we bring to the process — indicates that they have to bring the learner into the process in a more active manner. The exact implications of this will vary from context to context but it is something that needs to be considered as we look at educator training and practice.

See Content Publishing for Education, page 67.

We see this analysis as being a significant contribution to the discussion on 21st Century skills. Our emergent categorization scheme gives us a 'big picture' of what we mean when we say 21st Century learning. Clearly the demarcation between the three categories (and the subcategories) is not clear-cut — there are overlaps between them, but our emergent framework does provide a clearer vision of the field — one that had been dominated by multiple, seemingly conflicting perspectives.

The perspective we are arguing for values all aspects of 21st-Century learning — foundational, humanistic, and meta. To achieve a harmony between these three, especially in this technology-driven 21st Century learning, it is critical to remind ourselves that while creativity and innovation need to be supported in classrooms, this should not undermine the

NOTHING HAS CHANGED

importance of disciplinary and cross-disciplinary knowledge. In fact, creativity, collaboration and critical thinking cannot happen without disciplinary or cross-disciplinary foundations. Finally, the humanistic perspective provides a lens and a set of broader values that allow us to be purposeful as we decide what foundational knowledge is to be emphasized, and how we act on that knowledge.

See Content Publishing for Education, page 67.

It is clear to us that as 21st Century educators, we need to first step away from the hype surrounding new technologies and Internet resources to understand that in some ways the goal of schooling and education has not changed. It is still about instilling ways of thinking in learners that are tightly connected to disciplinary ways of knowing embedded within a humanistic world-view. The mere presence of Information and Communication Technology (ICT) and the immediate availability of information does not mean that these forms of knowledge are obsolete. New tools and technologies do provide us with new and innovative ways of acquiring and transmitting such knowledge, but they do not fundamentally change the goals and purposes of education.

Our analysis indicates that this seeming paradox of 'nothing has changed' and 'everything has changed' provides us a way forward. It suggests that though the 21st Century is different from previous times it does not mean that our core roles (to know, to act, and to value) have changed. So, in that sense, there is no contradiction between what we have been doing as educators in the past and what we do today (and in the future). That being said, it also indicates, even as we hold on to these core ideas, we have to continually shift and come up with newer ways of instantiating them. Though the way knowledge is represented and acted upon may change, the core idea of what we do as educators has not.

EVERYTHING HAS CHANGED