

Fostering Technology and 21st century skills to address the Challenges of Education in 21st Century

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ABSTRACT

The use of technology has become imperative to address the challenges of education in 21st century. Students need to be equipped with the 21st century skills to ensure their competitiveness in the globalization era. They are expected to master the 21st century skills in addition to being excelled in their academic performance. Therefore, it is crucial to incorporate 21st century skills in education with the help of technology. Technological competency is one of the skills required in digital age literacy. It means knowledge and understanding of the use of technology required for personal decision-making, participation in civic and cultural affairs, and economic productivity. Technical literacy is important in our modern society since they are many issues related to science and technology. Use of suitable technology improves process skills consist of interpreting data, operational definition, control variables, make hypotheses and experimenting. This paper will further explain about the 21st century skills, scientific literacy and science process skills. It also explains about the intersection of process skills and 21st century skills in addressing the challenges of education.

Keywords: Use of technology, 21st century skills, Technical competency

1. INTRODUCTION

The technology has now become an integral part of education and the idea of education without technology is unimaginable in 21st century. Thanks to the explosion of information and communication technology, a student has various source of learning. The rapid development of technology and information dissemination is resulting in the expansion of knowledge which in turn impacting the culture, economy and outlook of a country. The education sector is undergoing a paradigm shift in which learning should be changed from horizontal to loop of knowledge that combines knowledge, application and continuous contribution (Kamisah & Neelavany, 2010).

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.

In 21st century, it is compulsory for a teacher to possess both technological knowledge base as well as pedagogical knowledge base to enhance competency of their students. Schools need to teach problem solving, collaboration, digital literacy and critical thinking to help students flourish in today's world. 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. In addition to three Rs, teachers should be able to impart three Cs: creativity, communication, and collaboration among the students. Powerful learning of this nature demands well-prepared teachers who draw on advances in cognitive science and are strategically organized in teams, in and out of cyberspace. Twenty-first-century learning embodies an approach to teaching that marries content to skill. Without skills, students are left to memorize facts, recall details for worksheets, and relegate their educational experience to passivity.

The Internet, which has enabled instant global communication and access to information, likewise holds the key to enacting a new educational system, where students use information at their fingertips and work in teams to accomplish more than what one individual can alone, mirroring the 21st-century workplace.

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. We need 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 will make India a global leader in the 21st century is acting on what we know to educate all children, regardless of socioeconomic background.

2. THE CHALLENGES OF 21st CENTURY

The challenges of 21st century are as under:

Resistance to change. Resistance to technology comes in many forms, but one of the key resistance challenges identified in the report is "comfort with the status quo." According to the researchers, teachers and school leaders often see technological experimentation as outside the scope of their job descriptions.

Professional development. The lack of adequate, ongoing professional development for teachers who are required to integrate new technologies into their classrooms yet who are unprepared or unable to understand new technologies.

"All too often, when schools mandate the use of a specific technology, teachers are left without the tools (and often skills) to effectively integrate the new capabilities into their teaching methods," according to the report. "The results are that the new investments are underutilized, not used at all, or used in a way that mimics an old process rather than innovating new processes that may be more engaging for students."

MOOCs and other new models for schooling. New models for teaching and learning are providing "unprecedented competition to traditional models of schooling." In particular, the MOOC (massive open online course) — probably the hottest topic in higher education right now — was identified as being "at the forefront" of discussions about new modes of delivering K-12 education. "K-12 institutions are latecomers to distance education in most cases, but competition from specialized charter schools and for-profit providers has called attention to the needs of today's students, especially those at risk," according to the report.

Delivering informal learning. Related to challenge 3, rigid lecture-and-test models of learning are failing to challenge students to experiment and engage in informal learning. But, according to the report, opportunities for such informal learning can be found in non-traditional classroom models, such as flipped classrooms, which allow for a blending of formal and informal learning.

Failures of personalized learning. There's a gap between the vision of delivering personalized, differentiated instruction and the technologies available to make this possible. So, while K-12 teachers seem to see the need for personalized learning, they aren't being given the tools they need to accomplish it, or adequate tools simply don't exist.

Challenge 6: failure to use technology to deliver effective formative assessments. The report noted: "Assessment is an important driver for educational practice and change, and over the last years we have seen a welcome rise in the use of formative assessment in educational practice. However, there is still an assessment gap in how changes in curricula and new skill demands are implemented in education; schools do not always make necessary adjustments in assessment practices as a consequence of these changes. Simple applications of digital media tools, like webcams that allow non-disruptive peer observation, offer considerable promise in giving teachers timely feedback they can use."

3. 21st CENTURY SKILLS

The 21st century learner is a self-directed learner, globally aware, a communicator, an innovator, financially and economically literate, civically engaged, a problem solver, a collaborator, information and media literate and a critical thinker. That is a lot that the learner of today needs to achieve. To create such learners, we need to take our teaching and learning above and beyond the basics of knowledge sharing to embracing the 4 C's as they call it, the 'Super Skills' for the 21st Century!

The first of these is Communication – strong thoughts, questions, ideas and solutions.

Next is Collaboration – working together to reach a goal – putting together talent and expertise with smart work schedules.

The third skill is Critical Thinking – looking at problems in a new way, linking learning across subjects and disciplines.

The last of these C's is the skill of Creativity – creating and exploring new approaches to getting things done innovatively.

Few important tools essential for the 21st century learner are –

(a) Global Awareness

Creating global awareness in our learners using the 21st century skills to understand and address global issues, learning from and working collaboratively with individuals representing diverse cultures, religions and lifestyles in a spirit of mutual respect and open dialogue in personal, work and community contexts and understanding other nations and cultures is a necessity in these times.

Teachers use the assemblies for discussion of global happenings in the form of street plays, debates, talk shows, presentations to make the child become a part of the global scene instead of just knowing what is in their text books. Role plays in the classrooms to enact scenes from different cultures, wearing the costumes of different countries helps them to understand the people from around the world better. We now know that we are all a part of this big global village and no man can live as an island by himself. Participating in the mock sessions of the world parliaments, praying for unity and peace in all the nations of the world and the practice of the all religion prayer being a part of every event of the school further creates a bonding among children of diverse faiths and religions.

(b) Learning and Innovation Skills

Learning and innovation skills increasingly are being recognized as the skills that separate students who are prepared for increasingly complex life and work environments in the 21st century, and those who are not. A focus on creativity, critical thinking, communication and collaboration is essential to prepare students for the future. The collaborative exercise not only developed communication skills but also taught the children in a silent way how to assist, empathize with fellow learners and help each other to get a task done.

(c) Critical Thinking

Teachers should give learners ample opportunities to exercise various types of reasoning (inductive, deductive, etc.) as appropriate to the situation (experiments were conducted in the classroom as there is no science lab in our school).

Through these practical activities the learners learn to analyse how parts of a whole interact with each other to produce overall outcomes in complex systems. Getting children to research and make models of machines, etc also enhances their reasoning abilities to make judgments and decisions, interpret information and draw conclusions based on it and ask significant questions that clarify various points of view and lead to better solutions.

(d) Communication and Collaboration

Opportunities to communicate should be provided to enact role plays as groups in class, give speeches or talks in assemblies, debates and group discussions on current issues, prepare and explain power point presentations on different occasions, participate in video conferences with different schools on global issues of faith, culture and diversities.

In the process, they will learn to

- Listen effectively and use communication for a range of purposes (e.g. to inform, instruct, motivate and persuade)
- Utilize multiple media and technologies, communicate effectively in diverse environments, collaborate with others demonstrate the ability to work effectively and respectfully with diverse teams.
- Assume shared responsibility for collaborative work, and value the individual contribution made by each team member.

4. TECHNOLOGICAL SKILLS

Technological literacy means knowledge about what technology is, how it works, what purposes it can serve, and how it can be used efficiently and effectively to achieve specific goals. Visual literacy means the ability to interpret, use, appreciate, and create images and video using both conventional and 21st century media in ways that advance thinking, decision-making, communication, and learning. Information literacy means the ability to evaluate information across a range of media; recognize when information is needed; locate, synthesize, and use information effectively; and accomplish these functions using technology, communication networks, and electronic resources.

There are four major areas wherein the value 21st century education technology brings to the classroom environment.

First: The addition of technology into the classroom can help transform the classroom experience from a classic teacher centred one into a student-centred experience – with students taking a more active role in their learning. In a student-centred classroom, the teacher becomes more of a guide as the students engage with and tackle the day's lesson. And there is nothing better than seeing your students fully engaged! It is important to understand that integrating technology into the classroom is by no means a replacement for an effective teacher. To put it simply, the ideal classroom environment would be one that is student centred and includes a carefully selected blend of instructional technologies with face-to-face communication.

Second: Technology provides teachers and students with access to a variety of educational resources that inspire creativity, critical thinking, communication, and collaboration.

- It promotes inclusion and the development of digital literacy skills.
- It extends learning beyond the text – and beyond the classroom walls.
- It ultimately exposes students and teachers to new online global communities. This in turn promotes a global awareness, which is an essential component to a 21st century education.

Third: We all know that there has been, and will continue to be, different levels of students in our classrooms – and with uniquely important learning needs. Through the use of instructional technology, differentiated instruction can be made much easier. It can become more of a reality! With differentiated instruction, students are provided an education that is personalized – and that meets them where they are, developmentally. More students are able to benefit from this type of instruction. The use of technology also provides students access to very rich learning materials outside of the classroom.

Fourth: It is of paramount important that while in school, students use tools that will best prepare them for their future academic and professional experiences. – This includes a blend of new tech and old tech. Integrating technology into the classroom provides students with a set of skills to navigate through the variety of online tools we have today! It also provides teachers opportunities to educate students on digital citizenship and the new challenges to academic integrity.

5. CONCLUSION

In line with developments in technology and the explosion of knowledge in the digital age, the 21st century skills can be cultivated through technical process skills.

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; 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.

Adaptability, complex communication skills, non-routine problem solving, self-management, and systems-thinking are essential skills in the 21st-century workforce. From my 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 will prepare students for the workplace and college. We 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 is simply good practice. It's time to let go of polarizing debates, consider the evidence, and get to work.

Learning in the 21st century has a learning-on-demand format. We no longer spend time learning or researching topics that are not of interest to us. The content that matters to us come in short tweet-like form and everything else that we may need for the moment is available to be found - through Google, social networks, the Internet at large.

We don't need to worry that students are tweeting, Facebooking, writing a paper and watching TV all at the same time. The fact that we can't do it, doesn't mean they can't. It's part of their new learning style which allows students to be recipients and creators of information at the same time. Our students are effectively preparing themselves for a new kind of workplace - fast pace, technology-rich, and fostering life-long learning. Thus the institution should adopt transition from:

- Knowing to Doing,
- Teacher-centred to student-centred,
- The Individual to The Team,
- Consumption of Information to Construction of Meaning and
- Schools to Networks (online peers & experts) for making the learners ready to face the challenges of 21st century.

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