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Global Impact of Innovative Technologies in Education

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Abstract: *The current era of pervasive technology has substantial implication to education. What was once regarded as the niche channel for the delivery of educative content is rapidly becoming mainstream, increasing access to education, expanded revenue opportunities and new market for content for universities. Social networking is now used as a tool for supporting career activates and building connections with alumni. Technology will continue to have significant role in the advancement of education. Both private and public sectors approve that technological innovations will continue to have major effects on teaching approaches over the coming years. Technology has the power to transform how people learn - but walk into some classrooms and you could be forgiven for thinking you were entering a time warp.*

No generation is more at ease with collaborative, online technologies that the today's digital natives who are immersed in computing environment. Where pen and notebooks formed the toolkit of previous generations, today's learners come to class armed with laptops, smart phone and iPod. The current era of pervasive technology has substantial implication to education. Technological innovation, a hallmark of academic research, is changing the way that students learn and universities teach. For learning institutions, charged with the responsibility of equipping students to compete in the current knowledge economy, the prospects are great. Distance learning, opportunity to work with researcher across the globe and the sophisticated systems of learning management, are just a fraction of the transformational benefits that academic institutions are embracing. However, substantial challenges also loom.

Despite its benefits, technology is still a disruptive innovation, as well as an expensive one. Faculty members are forced to invest time in learning new approaches with little budget support.
With technology, students are more than ever engaged in creating their own knowledge. Distance learning and online degree programs have gained firm foothold in academic institutions all over the globe. What was once regarded as the niche channel for the delivery of educative content is rapidly becoming mainstream, increasing access to education, expanded revenue opportunities and new market for content for universities.

Social networking is now used as a tool for supporting career activates and building connections with alumni.
Electronic-marketing campaigns expend the success and reach of recruiting as well as fundraising efforts, ultimately driving down the cost of direct mail campaigns. Self-service, automated programs reduce administrative requirements, enhance academic life and streamline course registration. Although participants perceive such changes as having a largely positive effect, a number of institutions struggle with the challenges of rising cost of information technology and avoiding technological obsolescence. In addition to lack of inadequate instructional personnel and insufficient resources can also impede the adoption of such technologies. Despite of these obstacles, many believe that technology will become more interwoven into the fabric of scholastic life.

Technology will continue to have significant role in the advancement of education. Both private and public sectors approve that technological innovations will continue to have major effects on teaching approaches over the coming years. Certainly, it will be a core differentiator in attracting corporate partners and students in academic institutions.

Distance learning and online programs are gradually gaining a firm foothold in academic institutions all over the world. Studies have shown that more than two-thirds of all academic instruction in the world offer online courses. Most of them consider distance learning as key in advancing their mission, increasing access to education. Academic-Corporate partnership will form a significant part of the academic experience. At a time where controlling and funding costs are key concerns, corporate partners will be vital in advancing the mission of academic institutions. To attract corporate partners, learning institutions will be required to demonstrate a commitment towards advanced technologies

Education and Globalization.

Distance learning is increasingly becoming global with technologies being the impetus to putting education within the reach on many students around the world. The norm of many universities is having

oversees presence and this is well supported by data from Ukba , which shows reduction in students' influx. According to the latest data, video for homework is on the rise; mobile computing is "beyond the tipping point"; and most kids don't use traditional computers to connect to the Internet at home. Those are just three of the major trends revealed in the 2013 Speak Up Survey from Project Tomorrow, which CEO Julie Evans revealed at the FETC 2014 conference.

Personal Access to Mobile Devices

According to the 2013 results, students overwhelmingly have access to personal mobile devices. "If there was any doubt in our mind that we were beyond the tipping point in terms of kids carrying a computer in their pocket, backpack or purse," she said, "we're there."

Specifically, said Evans, 89 percent of high schools students have access to Internet-connected smart phones, while 50 percent of students in grades 3 through 5 have access to the same type of devices. High school student access to tablets tops out at 50 percent and laptops come in at 60 percent. In addition to personal access, the survey found about a third of students have access to a device (typically laptops or tablets) in their school.

Internet Connectivity

For Evans, this was an interesting set of statistics showing the ways students generally connect to the Internet when at home. According to the study, 64 percent of students surveyed identify 3G- or 4G-enabled devices as their primary means of connecting to the Internet, with another 23 percent saying they connect through an Internet-enabled TV or Wii console. When asked why traditional broadband access wasn't their primary means of connectivity, students said there was less contention for access with other members of the family through these non-traditional devices.Technology ushers in fundamental structural changes that can be integral to achieving significant improvements in productivity. Used to support both teaching and learning, technology infuses classrooms with digital learning tools, such as computers and hand held devices; expands course offerings, experiences, and learning materials; supports learning 24 hours a day, 7 days a week; builds 21st century skills; increases student engagement and motivation; and accelerates learning. Technology also has the power to transform teaching by ushering in a new model of connected teaching. This model links teachers to their students and to professional content, resources, and systems to help them improve their own instruction and personalize learning.

Online learning opportunities and the use of open educational resources and other technologies can increase educational productivity by accelerating the rate of learning; reducing costs associated with instructional materials or program delivery; and better utilizing teacher time.

Virtual or online learning:

In USA 48 states and the District of Columbia currently support online learning opportunities that range from supplementing classroom instruction on an occasional basis to enrolling students in full-time programs. These opportunities include dual enrollment, credit recovery, and summer school programs, and can make courses such as Advanced Placement and honors, or remediation classes available to students. Both core subjects and electives can be taken online, many supported by online learning materials. While some online schools or programs are homegrown, many others contract with private providers or other states to provide online learning opportunities. Full-time online schools:

The following online or virtual schools enrol students on a full-time basis. Students enrolled in these schools are not attending a bricks and mortar school; instead they receive all of their instruction and earn all of their credits through the online school.

State operated The Florida Virtual School – An online school that provides full-time learning opportunities to students in grades K-12. Districts can also work with Florida Virtual School to provide blended learning opportunities to students by enabling them to access online courses from school sites. Additional link here. Utah Electronic High School – An 18-year-old online high school providing a range of courses to students year round. The school can award diplomas to students who are home-schooled, have dropped out, or are ineligible to graduate from a traditional high school for specific reasons. North Carolina Virtual Public School – An online high school offering 120 courses to students both during and after the school day. The courses offered include Advanced Placement and honors courses, world languages, electives, credit recovery, and online college courses. The school also provides test preparation and career planning services to students. District operated Karval Online Education – A public K-12 online school for Colorado residents that provides a free computer for the family to use while the student is enrolled and provides reimbursement opportunities to offset Internet and other educational expenses. Dual credit courses are available to juniors and seniors. Campbell County Virtual School – This school serves Wyoming students in grades K-6. Families of enrolled

students are loaned a computer and receive subsidized Internet access, as well as materials including CDs, videos, instructional materials, and hands-on tools and resources to complement the interactive online elements of the program.

Salem-Keizer Online – This online Oregon high school is an accredited program of Roberts High School in the Salem-Keizer Public School District in Oregon. The school provides 24/7 learning opportunities to students living within the boundaries of the school district and who are not enrolled in their neighborhood public school. Tuition is only required for students enrolled in summer school courses. Charter operated Guided Online Academic Learning Academy – An online public charter high school in Colorado for students ages 14-21. The Academy offers more than 200 courses to students as well as a variety of support services, activities to support student-to-student interactions, and drop-in centers to facilitate enrollment, counseling, assessments, and other services. Blended learning: Blended learning opportunities incorporate both face-to-face and online learning opportunities. The degree to which online learning takes place, and the way it is integrated into the curriculum, can vary across schools. The strategy of blending online learning with school-based instruction is often utilized to accommodate students' diverse learning styles and to enable them to work before or after school in ways that are not possible with full-time conventional classroom instruction. Online learning has the potential to improve educational productivity by accelerating the rate of learning, taking advantage of learning time outside of school hours, reducing the cost of instructional materials, and better utilizing teacher time. These strategies can be particularly useful in rural areas where blended or online learning can help teachers and students in remote areas overcome distance.

State operated Michigan Virtual School – Michigan's students are able to take online classes and access online learning tools from their middle and high schools via this virtual school. Michigan Virtual also provides full-time learning opportunities to middle and high school students. Districts in the state work with the virtual school to grant course credit and diplomas to students.

District operated Walled Lake Consolidated School District – This Michigan district's online summer school credit recovery program was expanded to include online learning opportunities during the school year. Students can now enroll in up to two online courses each semester while continuing to attend school for at least four hours a day. Eleventh and twelfth graders may also choose to enroll concurrently in postsecondary courses via a partnership with a local community college. The credit recovery program reduced per-student costs by 57 percent and the district estimates that by offering two online courses during the school year it has been able to save $517 per student on instructional costs. Riverside Virtual School – This school makes interactive courses available to students in Southern California and to other students in rural schools in the state. Students in grades 6-12, including those who are homeschooled, may enroll full-time.

School operated San Francisco Flex Academy – This high school is a five-days-a-week hybrid school that provides an online curriculum that personalizes learning and enables students to move through courses at their own pace. These online courses are taken at the school site and are supported by credentialed teachers. Rocketship – This elementary charter school network in California is a hybrid school model. Each day, students attend the Learning Lab where they use computers to support their individual learning needs. These Labs do not require certified teachers, enabling Rocketship to reinvest the savings in training, Response to Intervention, higher teacher salaries, facilities, and academic deans. While students are in the Lab, teachers are engaging in planning. Carpe Diem Collegiate High School – Carpe Diem is a hybrid school in Arizona that offers computer-assisted instruction and onsite teacher facilitators. This model enables students to progress as they demonstrate mastery.

iPrep Academy - This Miami-Dade County Public School offers a teacher-facilitated virtual curriculum to 11th graders. Its motto is "learn anytime, anywhere at" and at the students' own pace. The curriculum includes Advanced Placement and honors courses, distance learning opportunities that enable students to engage with their peers from around the world, and applies real word experiences to learning. Open educational resources: Open educational resources are teaching, learning, and research resources that reside in the public domain and are freely available to anyone over the Web. They are an important element of an infrastructure for learning and range from podcasts to digital libraries to textbooks and games. It is critical to ensure that open educational resources meet standards of quality, integrity, and accuracy—as with any other educational resource—and that they are accessible to students with disabilities.

Open High School of Utah – This school uses open educational resources to create an open source curriculum. To create this curriculum, teachers gather and sort through open source materials, align them with state standards, and modify the materials to meet student needs.

CK-12 – CK-12 FlexBooks are customizable, standards-aligned, digital textbooks for grades K-12. They are intended to provide high-quality educational content that will serve both as core text and provide an adaptive environment for learning. Leadership Public Schools (LPS) – In each of the four LPS schools, teachers

work together to utilize open-source materials to meet the specific learning needs of their students. Through a partnership with CK-12, LPS has developed College Access Readers, a series of online books with literacy supports embedded in them to meet the individual needs of students, from advanced to under-performing students.

Khan Academy – The Khan Academy is a not-for-profit organization providing digital learning resources, including an extensive video library, practice exercises, and assessments. These resources focus on K-12 math and science topics such as biology, chemistry, and physics, and include resources on the humanities, finance, and history. Mooresville Graded School District – This North Carolina district launched a Digital Conversion Initiative to promote the use of technology to improve teaching and learning. In addition to the use of laptop computers and other technologies as instructional tools, the Initiative led to a shift to digital textbooks which are aligned to the state's standards. Vail Unified School District – This Arizona district has replaced textbooks with a digital learning environment that enables every school in the district to take advantage of an online tool to create digital textbooks and support effective teaching.

Use digital resources well: Schools can use digital resources in a variety of ways to support teaching and learning. Electronic grade books, digital portfolios, learning games, and real-time feedback on teacher and student performance, are a few ways that technology can be utilized to power learning.

High Tech High – High Tech High (HTH) is a network of eleven California charter schools offering project-based learning opportunities to students in grades K-12. HTH links technical and academic studies and focuses on personalization and the connection of learning to the real word. To support student learning and share the results of project-based learning, HTH makes a wealth of resources available online, including teacher and student portfolios, videos, lessons, and other resources.

New Technology High School – At this California school, student work is assessed across classes and grades, and feedback is made available to students via online grade books. These grade books are continually updated so that students can see how they are doing not only in each course, but also on each of their learning outcomes, averaged across all their courses. Electronic learning portfolios contain examples of students' work and associated evaluations across all classes and grades. New Tech High is part of the national New Tech Network.

Quest to Learn – This school, located in New York, utilizes games and other forms of digital media to provide students with a curriculum that is design-led and inquiry-based. The goal of this model is to use education technologies to support students in becoming active problem solvers and critical thinkers, and to provide students with constant feedback on their achievement. Technology has the power to transform how people learn - but walk into some classrooms and you could be forgiven for thinking you were entering a time warp. There will probably be a whiteboard instead of the traditional blackboard, and the children may be using laptops or tablets, but plenty of textbooks, pens and photocopied sheets are still likely.

And perhaps most strikingly, all desks will face forwards, with the teacher at the front.

The curriculum and theory have changed little since Victorian times, according to the educationalist and author Marc Prensky. "The world needs a new curriculum," he said at the recent Bett show, a conference dedicated to technology in education. "We have to rethink the 19th Century curriculum." Most of the education products on the market are just aids to teach the existing curriculum, he says, based on the false assumption "we need to teach better what we teach today". He feels a whole new core of subjects is needed, focusing on the skills that will equip today's learners for tomorrow's world of work. These include problem-solving, creative thinking and collaboration. 'Flipped' classroom. One of the biggest problems with radically changing centuries-old pedagogical methods is that no generation of parents wants their children to be the guinea pigs. Mr Prensky he thinks we have little choice, however: "We are living in an age of accelerating change. We have to experiment and figure out what works."

"We are at the ground floor of a new world full of imagination, creativity, innovation and digital wisdom. We are going to have to create the education of the future because it doesn't exist anywhere today."

He might be wrong there. Change is already afoot to disrupt the traditional classroom. In a "flipped" classroom, children get on with work and teachers act as guidesThe "flipped" classroom - the idea of inverting traditional teaching methods by delivering instructions online outside of the classroom and using the time in school as the place to do homework - has gained in popularity in US schools. The teacher's role becomes one of a guide, while students watch lectures at home at their own pace, communicating with classmates and teachers online.

Salman Khan is one of the leading advocates of "flipped" classrooms, having first posted tutorials in maths for his young cousins on YouTube in 2004.

Their huge popularity led to the creation of the not-for-profit Khan Academy, offering educational videos with complete curricula in maths and other subjects.

The project has caught the eye of the US Department of Education, which is currently running a $3m (£1.9m) trial to gauge the effectiveness of the method. Now the idea has reached the UK.

Teachers 'surprised' Mohammed Telbany heads the IT department at Sudbury Primary School in Suffolk. He has

been experimenting with the "flipped" classroom and recently expanded it to other lessons. "The teachers facilitate, rather than standing in front of the children telling them what to do, and the children just come in and get on with what they are doing," he says.

"It has surprised the teachers that the kids can excel on their own, with minimal teaching intervention." In the developing world where, according to some estimates, up to 57 million children are unable to attend primary school, the idea of children learning without much adult intervention is a necessity not a luxury. Prof Sugata Mitra, from Newcastle University, has been experimenting with self-learning since his famous hole-in-the-wall computer experiments in the slums of Delhi in 1999. The School in the Cloud project opened this month in India He was amazed at how quickly the children learned how to use the machines with no adult supervision or advice.From that was born the idea of "cloud grannies" - retired professionals from the UK, mentoring groups of children in India via Skype. He won the $1m Ted prize in 2013 to build a series of self-organising learning environments in both the UK and India.

In January he completed the last of seven such units - a striking solar-powered glass building amid the lush vegetation of the village of Gocharan in West Bengal. There will be no teachers and up to 40 children can participate when it suits them. They will have the internet at their disposal and will work in small groups. E-mediators will mentor the children via Skype.

Dr Suneeta Kulkarni, research director of the School in the Cloud project, said children would "engage in a variety of activities that are driven by their interest and curiosity", with games typically tried first. The children will also be asked "big questions" that they can answer online.

"At yet other times these questions emerge from what the children 'wonder' about. It is also where the grannies or e-mediators are expected to play a significant role," she said.

Classroom games When Canadian teacher and computer programmer Shawn Young wanted to spruce up his lessons, his first thought was gaming. It was a platform many of his students were familiar with and something that was proven to engage children. But it also had a bad reputation in teaching circles - thought to be too violent, addictive and without educational merit.

Some early attempts to integrate educational content within games failed. But what makes Classcraft different is that it is not about content - it is more a behaviour-management and motivation tool. Linking behaviour and attitude to a game could be a way of engaging children"The teacher teaches as normal. Teachers can offer pupils points for good behaviour, asking questions, or working well in their teams and it gives them access to real life powers," Mr Young says. Those powers are decided by the teachers and may include handing in homework a day late. There are also penalties for those not concentrating in class, turning up late or being disruptive. Children play the game in teams, which means a lost point affects the entire group, and encourages them to work together. "It is being used in a school in Texas which has a mix of white, Mexican and Afro-Americans. They would never normally speak to each other," said Mr Young. Teachers using the system - some 100,000 have signed up since it launched in August - have noted not just better interaction between pupils, but better classroom engagement and motivation. "As in other games there are sometimes random events, which could be something like everyone having to speak like a pirate for the day or the teacher having to sing a song in class. The kids love it."

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