The Battle of the Ts: Teachers vs Technology

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Invasion is an eternal phenomenon. Ever since the beginning of time it has been the harbinger of innovation and advancement. Time and again it has been observed that not all invasions last long, nor is the end always disastrous. Wars have been won over, with the best of strategies, the right attitude and intrinsic aptitude. Is technology invading our territory of Teaching and Learning? Technology is not a recent innovation. A close analysis of the history of the advent of technology into the education system results in numerous fascinating facts that epitomize today's educational platform and where it goes in the longer term.

The Slide Rule in the 1600s

- Robert Bissaker introduced the Slide Rule in 1964 which became popular among engineers during the 1970s. Mathematical problems were solved with its help in the classroom. It was indeed a precursor to the modern day electronic and graphing calculators.
- During the same period, the Hornbook was introduced as a technological device that made teaching basics like vowels and consonants very effective.
- Magin Catacoprica, which meant õmagic lanternö introduced in 1646, became a common device used in homes, theatres and classrooms where it helped to enhance student interest and eventually learning. Photographic slides were inserted one by one to view images using this device.

Technology in the 1700s and 1800s

- Joseph Marie Jacquard introduced the Jacquard Loom in 1725 which in fact marked the beginning of computer programming of today
- Slates and chalks were introduced.
- Soon, blackboards followed based on the same technology.
- In this period the revolutionary invention of a calculating engine in 1822 by Charles Babbage heralded the modern digital computing.
- The typewriter was introduced by Christopher Sholes in 1876 which also included the keyboard. It is the same that is still used on modern day devices

Technology in the 1900s

- A wonderful instrument called a stereoscope was invented to view images in 3 Dimension. Initially it became very famous for family entertainment and was later used by teachers in classrooms as an aid. This helped the students to visually enjoy viewing 3D images that augmented the teacherøs points.
- This was followed by the film projector in 1925. Images could be displayed using a film strip along with an audio recording.
- On air classes popping up for any student within listening range marked the introduction of radio in the 1920s. The Board of Education aired the first lesson in New York in 1925.
- Equipped with the mimeographs in the 1940s, teachers felt comfortable as they began to print classroom materials on a large scale. Hundreds of copies were made manually by means of a stencil.
- Headphones came as a blessing to students in the 1950s and listening stations were replaced by language labs with computers and headphones of the present day.
- Videotapes also emerged at about the same time.
- A behavioral therapist, B.F. Skinner designed the Skinner Teaching Machine which allowed flexibility in time for the students to learn.
- The photocopier in 1959 outdated the mimeograph as classroom materials could be produced rapidly.
- Calculators (1972) entered the classroom making mathematical classes enjoyable.
- Michael Sokolski's Scantron system of testing in the early 1970s allowed teachers to grade tests more quickly and efficiently.
- PBS (Public Broadcasting System) penetrated homes as well as classrooms in the 1970s thus enabling watching visual programs in any environment, giving flexibility in learning.

Computers and Classrooms

• Personal computers on desktops, Apple II, was introduced by Apple in 1977 which came as a blessing to students to solve difficult math equations as well as to learn Geography.

- Following it, IBM rolled out the first personal computer. Time magazine selected this personal computer as the "Machine of the year" in 1982. It was the first time that the magazine had selected a non-human recipient for the award.
- Computers emerged as incredibly effective tools for learning, redefining the way of teaching and learning. Marvin Minsky of M.I.T rightly observed, õOnce the computers got control, we might never get it back. We would survive at their sufferance. If we@re lucky, they might decide to keep us as pets.ö (Wikiquote.org)
- The CD-ROM introduced students to a new world of learning openings. The entire encyclopedia came on to a CD. Gradually it was replaced with the flash drive.
- During the early 1990s, the internet was freely available to all and this unlocked a new world of opportunities for learning.
- By the late 1990s, the White interactive board replaced the traditional black board and gradually entered into classrooms around the globe to stay.

21st Century Revolutions

- 21st century technology facilitated linking classrooms, schools as well as colleges.
- You Tube proved to be an efficacious device to share video lessons as post classroom teaching in 2004.
- Along with this, the iClicker too became a charming device which allowed teachers to conveniently interact with students during a lesson and get the results instantaneously.
- Smartphones came into the scene between 2007 and 2010. These fully functional mobile
 phones had the same functionality as a personal computer. They increased in fame and were
 extensively used. The website Statista estimated around 21.18 million Smartphones in use in
 Saudi Arabia in 2017 (Statista, July 2017).
- The iPad provided endless opportunities to create customizable hands-on learning experiences. Wi-Fi allowed mobile devices to take the lead as a vanguard in the classroom as a learning gizmo.
- By 2015, interactive mobile apps for all types of devices gained popularity and have become contrivances of effective interactive learning.

• Low- cost apps and their free access enable teachers to offer various learning mechanisms and methods. A sea of changes is gradually emerging putting learning and teaching in a new light.

Proliferation of Online Courses

The 21st century era has also revolutionized the mode of schooling amongst young college students. There is a dramatic boom in the enrollment of on-line guides presented with the aid of prestigious universities around the globe. Any foreign language can be learned. A student can actually get a diploma or a degree even without leaving his study room at home.

The edX for Business offers around 2200 courses developed by more than 130 of the worldøs top universities. Harvard University offers 136 courses in 11 different disciplines and some of them are absolutely free of charge. A simple app offering online lessons could now be more efficient and convenient than a whole traditional academic course. Massive online courses (MOOCs) are literally threatening the existence of traditional educational institutes. One of the top online sites called Courseraøs vision reads õWe envision a world where anyone, anywhere can transform their life by accessing the worldøs best learning experience.ö Coursera boasts of serving 35 million learners with more than 150 university partners offering 2700 courses in 250 areas of specializations. (coursera.org) Other organizations like Lynda.com, Udemy, Udacity, Khan Academy and Codecademy are the emerging rivals of traditional universities. The word õcollegeö might make you think of students residing in dorms, hanging out in the campuses with books or gathering for classes in enormous lecture halls. But the depiction is becoming increasingly out-of-date as technology provides multifarious ways to learn. The horizon is far ahead and there are miles to go on this onward journey and there is no looking back.

Teachers and Technology

õRobot teacher conducts first class in Tokyo schoolö headlines the Daily Telegraph (2009) which admires the robot. õUsing a range of programmed movements from eyebrow arching to smiling, her face is capable of expressing six basic emotions in the classroom - surprise, fear, disgust, anger, happiness and sadnessö. (Danielle Demetriou, 2009) Many a teacher believes that finally technology is going to hijack jobs and a wave of teachers are emerging in the form of robots, a form of romantic rivals.

"Jobs were effectively taken by machines of various types and there was a hollowing out of the jobs market, and that left a lot of people for a lengthy period out of work and struggling to make a living.ö observes Andy Haldane (2018), chief economist at the Bank of England. He further adds õThis is the dark side of technological revolutions and that dark-side has always been there. That hollowing out is going to be potentially on a much greater scale in the future, when we have machines both thinking and doing - replacing both the cognitive and the technical skills of humans.ö (Andy Haldane, 2018)

With the advancement of innovation, instructive capacities are developing and changing each day. Any sort of information can be got through a click of the mouse as the internet is a large information library. As innovation propels, a teacher's capacities will develop significantly, and without the learning of these progressions and abilities, an educator has a direct possibility of being abandoned. "There is no longer a four-walled classroom," says Dr. Cecilia Goria, of Nottingham University's Language Centre. "Teaching and learning now extends beyond that." (Martin Williams, 2014) Great teachers can handle great technology. Teachers using technology make it a significant part in students' learning. After all, technology cannot interact with humans and so eventually cannot replace a teacher's role.

As Vivienne Collinson of Michigan State University rightly points out, õComputers do not teach children to question, to discriminate among sources of information, to weigh perspectives, to think about consequences, to bring contextual meaning to a situation, to be creative, or to make careful judgements.ö(Cognity.com, 2016) A teaching job requires relentless hard work and devotedness, and diligence always proves rewarding. It is imperative to update one's knowledge regarding the changing scenario in the field of learning and teaching. Teachers who are inclined towards technology and design can survive and withstand the protean technologies in all the spheres of the world.

The Future of Teachers

A modern teacher is a facilitator, guide and mentor. Technology is just an automated tool in the absence of a teacher. The question is not whether or not teachers can be replaced by technology, but how technology can be incorporated with everyday teaching. The calculator hasn't been able to replace Math teachers so far. In the same way, technology won't replace, but instead will continue helping teachers to take students to new heights. Real teachers are always needed. Machines cannot encourage, motivate and inspire learners as teachers do. Learning can be only be enhanced by good technology in the hands of superior teachers.

It is imperative that teachers become not only digitally literate but should qualify and excel in holding the reins of technology thus weaving it into the school fabric. Teacher training programs need to be revised and updated to meet the increasing demand of a world of technology. Tomorrow's technological advances may sound daunting, but if our attention is on the positive sides, future looks promising. Technology cannot solve the infinite problems in learning and teaching, but it can augment the teaching as well as learning experience. It can engage learners and help teachers to create a more exciting and a dynamic learning environment in and out of the classroom.

Not an easy journey, that's for sure; but all is not lost, for as long as there are Teachers with a charisma, light exists at the tunnel's end.

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