

## **EDUCATION 4.0 A STRATEGY TO BRIDGE THE GAP OF SMART PROFESSIONAL'S REQUIREMENT TO CONTRIBUTE TO INDUSTRY 4.0 VISION**

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### **ABSTRACT**

Industry 4.0 is no more a buzzword but Education 4.0 is one still. Broadly speaking Education 4.0 is a vision that inspires, innovative, scientific and smart ways of teaching-learning by engaging with technologies like Artificial Intelligence, Robotics, Data Analytics, Augmented Reality, Internet of Things to mention a few. The journey to embark on Industry 4.0 compliances starts through the visionary leadership and right set of skilled professionals the team, who will not only use the technology but also contribute to inventing the technology and maintaining it for public usage. Education 4.0 understands the critical and complex nature of the modern teaching-learning process, where skill development is more important than the mere retention of knowledge and information. Also, it has the potential to address the specific needs of different scholars aspiring for different skill-based upon their social, financial, geographical and educational background. Beyond all this Education 4.0 will motivate self-learning, at self-pace anywhere any time. The assessment and feedback will be more meaningful and applied to bring critical improvements in the shortest possible time. This research paper is a systematic approach to study the capacity and capability of Education 4.0 to meet the demand of highly skilled smart professionals who will support the cause of Industry 4.0. The study will target the industries and universities that are engaged in training and skills development to nurture a highly capable workforce.

**Keywords:** Education 4.0, Industry 4.0, Skill, Vision, Self-Learning

### **INTRODUCTION TO HOW EDUCATION SYSTEMS HAVE EVOLVED IN RESPONSE TO DEMANDS FROM SOCIETIES**

It is a general perception that 19<sup>th</sup>-century schools are still using 20<sup>th</sup>-century pedagogical practices to engage with most 21st-century students (Schleicher, 2018[8]) (Table 1).

#### *19th century*

The 19th century was an age of civil wars, colonialism and imperialism. With economic growth, standards of living and average income improved; and with the introduction of universal public schooling, more people benefitted from the gains of the industrial revolution. However, schooling was modeled to respond to societal demands for labor, and thus the goal of education was largely to prepare students for jobs. Teaching was also made "efficient": in mass education, one teacher was to teach as many students as possible with standardized content. Thus, the curriculum model that matched the demands of the labor market was static, linear and standardized.

#### *20th century*

The 20th century was marked by two world wars and the restoration of independence for many nations after a period of colonialism and imperialism. Broader goals for education were set during this period. Education was not just about learning for jobs, but for individual fulfillment too. The scope of curricula widened to include non-academic subjects, such as physical education. The curriculum was still static, linear and standardized; and assessment through standardized testing was valued to ensure accountability. Schools were expected to be accountable for their outcomes. Teachers were increasingly expected to comply with standards ensuring that all students, regardless of their background, were provided equitable opportunities to learn.

#### *21st century*

So far, the 21st century is characterized by interdependence among nations facilitated by global communication, the decentralization of power, which has been accelerated by social media, emerging nationalism, and increasing incidents of terrorism. Workplaces have become more flat, open, flexible and transparent; in organizations, teamwork is valued more highly than hierarchy.

It is also the age of accelerated technological innovations, such as cyber-physical technology, social media, Artificial Intelligence, robotics, the Internet of Things and 3-D printing, among many others. These innovations bring both opportunities and challenges, including questions about ethics and morals. Social media has provided some businesses with new opportunities, and business models have shifted to include those based on a shared economy.

In the education sector, some changes are already emerging. Schools are no longer seen as closed entities in themselves but as part of the larger eco-system in which they operate. Some schools collaborate with each other, forming networks or partnerships with other schools. Some schools have started to collaborate more widely with other organizations in their communities, such as scientific organizations, theatres, universities, social service organizations, technology companies and businesses, where teachers and students can become familiar with the skills and competencies that employers and other community members deem critical.

These schools aspire to operate with a curriculum that recognizes the need for interdependence and broadens the goals of education to include “education for citizenship”. Such a curriculum would recognize the differences between individual students and acknowledge that each student has different prior knowledge and skills, as well as different attitudes and values, and, therefore, may learn differently. Thus, curricula will have to be dynamic rather than static. They will have to allow for non-linear learning paths rather than expect all students to follow linear progressions along a single, standardized path. They will have to be more flexible and personalized to ensure that each student’s unique talents are developed so that all students can realize their full potential.

Table 1. Comparison of society, industry, and education across the 19th and 20th centuries, and the aspirational vision for the 21st century

	<b>19th-century</b>	<b>20th century</b>	<b>Vision for 21st century</b>
<b>World events</b>	Civil wars, racial segregation, colonialism and imperialism	World Wars I and II, independence of nation-states, Cold War	Interdependence among national states, decentralization of power, terrorist attacks, nationalism
<b>Technological innovations</b>	Electricity, telephone	Internet	Cyber-physical technology (social media, AI, 3-D printing, robotics)
<b>Main industry types and business climates</b>	Oil industry, textile industry Mass production by machine Focus on profit-making	Computers, electronics, financing Shift from manual to machines – automation Tailored production of goods and services for individual consumers Corporate social responsibility (CSR)	<p>Social media, Internet of things, big data, digitalization, post-truth (fake news)</p> <p>Shared economy, social entrepreneurship</p> <p>Consumers take part in the production of goods and services</p> <p>Focus on value making, sense-making</p> <p>The corporate shift to creating shared value (CSV) and considering to contribute towards the U.N. Sustainable</p> <p>Development Goals (SDG)</p>

**Source:** Autor (2013)

## **OVERVIEW OF INDUSTRY 4.0 DEMAND FROM THE EDUCATION SYSTEM.**

Industry 4.0 will demand and require the basic human competency of being curious and creative for innovations to align with the current and future demands. Education 4.0 will serve as a catalyst to ease the communication in reaching per individual of the population.

This amalgamation of technologies, connecting the smart machines is definitely going to be the game-changer. Which will redefine the relations between the demand and supply at its extreme? The model of jobs is reformed up to 50% where most of the repetitive tasks are already taken over by smart machines which do it with more accuracy, saving time and being more efficient to the organization.

Education 4.0 responds to this change to prepare an environment for future proof skills. The drivers of this massive change and transformation can be classified as:

Artificial intelligence for personalized learning, Augmented reality for smart learning, Skills development, Practical and applied studies, Digital Literacy, Job Creation, Transparency and Accountability.

One of the biggest prime movers of the global education system is the economy of the education and the interventions of IT in education. This is transforming the supply chain of new professionals who are nurtured to design the solutions for the problems which never existed before. Another perspective of E 4.0 is breaking the boundaries and erasing the myths about classroom teaching can only make good professionals. The flood gates opened by platforms like YouTube, Google, online learning etc. have completely redefined the modern education system. These ubiquitous technology has led to unparalleled access to information questioning the need for a classroom when technology has offered and on-demand availability of information that is free and at one's convenience making work and learning move fast.

This makes the policymakers think that old practices may not be sufficient to meet the new expectations. There is an urgent need to revamp and rethink the current needs of the corporate citizens and how we meet them by creating the right ecosystem. Internet of things, in particular, was an innovation for the ease but has become the strongest pillar to align humans with the cyber-physical world giving brain more space and time to be curious and creative, allowing the human brain to bring its natural tendency that fits the world in the present and future context.

One major demand that revolutionizing the internet of things brings is understanding the difference between information and knowledge. This unparalleled abundance of information which was the job of "traditional education" to provide to the students has actually starved students of knowledge. When in the present times we have information on our voice command and we can know anything within 2 seconds of time the job for the curious human mind should be what when and where and then putting the right information in a proper framework of perception gives the end product of knowledge. Curiosity and creativity are the sources of skills development and knowledge becomes of the future proof skill.

The importance of individual learning methods is something which was understood from years but is valued today majorly because of the present technology, social connectivity that has brought ease and space in people's lives. Quoting Albert Einstein "Everybody is a genius. But if you judge a fish by its ability to climb a tree, it will live its whole life believing that it is stupid." This was merely a quote in those times where we understood but never had the right methods to implement. According to recent research, the 21<sup>st</sup>-century students do not find the motive of learning standardized education shifting their interests and aspirations. A student may not like one subject but might excel in others. Students find learning things hand-on rather than watching others do it and taking notes. With industry 4.0 Artificial Intelligence and Augmented reality have stepped into making education more personalized.

With universities facing high dropout rates in recent years, the most important input of big data and Artificial Intelligence is to identify patterns of student's responses and performances, analyzing their educational data and assist the teachers to find ways to comprehend the material to individual students.

There is no good way or bad way of learning, few students thrive by the conventional methods of reading printed assignments while some find a wall of text in front of their eyes more understandable. AI identifies these trends of a student's educational data and interest and giving the best results to improve the educational outcomes.

According to the co-founder of New dawn Technologies, the study of the human brain shows that the things which appear more real or flashy have a longer life in the memory explaining why in recent times Facebook is the new newsletter for people and the stakes of readership have gone up. His experiments prove that humans are hardwired to find learning pleasurable. Augmented reality can make the course material to be more pleasurable and addictive. The educational application is a part of AR and AI is making education ubiquitous.

## EXAMPLES OF EDUCATION 4.0 IN ACTION

- **An award-winning chatbot in Leeds**

In the summer of 2018, a chatbot that helped boost enrolment of students through clearing at Leeds Beckett University won a Times Higher Education Leadership and Management Award (THELMA) for digital innovation.

- **Northampton's blended learning**

The University of Northampton has moved to a new £330m campus that has one large lecture theatre and several smaller spaces. Active Blended Learning (ABL) is embedded across the entire teaching practice.

The dean of learning and teaching, Professor Alejandro Armellini, explains: "The traditional view that the blend is a combination of online and face-to-face is pushed to one side. ABL is far more sophisticated, interesting and exciting than a mere combination of face-to-face with online teaching.

- **Bolton plans to co-ordinate through smartphones**

Bolton College launched its campus chatbot, Ada, in April 2017. At the outset, it could answer everyday questions from students about college services, life on campus and their studies.

## CONCLUSION

The demand for 21<sup>st</sup>-century students aligns with the demand of industry 4.0. The applied and practical studies that allow space for innovation and curiosity. This has become the need and as well as the demand of the generation.

Since Education 4.0 denotes strategic changes, relevant to Industry 4.0 demand of highly skilled manpower, the universities and institutions must timely respond to the call to the better-prepared workforce. The people with the right set of skills will be the driving force in taking forward the movement to building a smart and intelligent world. Education 4.0 is aimed at improving the productivity of an employee, improving the competitiveness of the industry. It aims to improve the productive and competitive capacity of the country as a whole. Such a system where creativity and innovativeness of the human brain are improved will make educated students more prepared for an uncertain and volatile future. Thus, with Education 4.0 the students, the Industry and the Country will be able to reap the dividends better in times of Fourth Industrial Revolution.

## REFERENCE

Autor, D. and B. Price (2013), The Changing Task Composition of the US Labor Market: An Update of Autor, Levy, and Murnane (2003), MIT Mimeo.

Bialik, M. and C. Fadel (2018), Knowledge for the Age of Artificial Intelligence: What should students learn?

Diwan, P. (2017). Is Education 4.0 an imperative for success of 4<sup>th</sup> Industrial Revolution? Accessed from <https://medium.com/@pdiwan/is-education-4-0-an-imperative-for-success-of-4th-industrial-revolution-50c31451e8a4>

Dunwill, E. (2016). 4 changes that will shape the classroom of the future: Making education fully technological. Accessed from <https://elearningindustry.com/4-changes-will-shape-classroom-of-the-future-making-education-fully-technological>.

Education technology and Mobile Learning (2016). 9 fundamental digital skills for 21<sup>st</sup> century teachers. Accessed from <https://www.educatorstechnology.com/2016/12/9-fundamental-digital-skills-for-21st.html>

Fisk, P. (2017). Education 4.0 ... the future of learning will be dramatically different, in school and throughout life. Retrieved from <http://www.thegeniusworks.com/2017/01/future-education-young-everyone-taught-together>

Kozinski, S. (2017). How generation Z is shaping the change in education. Retrieved from <https://www.forbes.com/sites/sievakozinsky/2017/07/24/how-generation-z-is-shaping-the-change-in-education/#304059746520>

Schleicher, A. (2018), World Class, <https://dx.doi.org/10.1787/9789264300002-en>.

Shwab, K. (2016). The Fourth Industrial Revolution: what it means, how to respond. Accessed from <https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond>

Soffel, J. (2016). What are the 21<sup>st</sup>-century skills every student needs? Accessed from <https://www.weforum.org/agenda/2016/03/21st-century-skills-future-jobs-students>