TEACHING RE-IMAGINED AS THE WORLD EMBRACES THE 4TH IR: A REVIEW OF LITERATURE ON THE CHANGING FACE OF TEACHING

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ABSTRACT. This paper reviews the literature on teaching in educational institutions at the current time and its ability to match the demands of industry, and produce competent human resources for today and the future generation. The study was conducted to shape and inform new-generation teachers of the aspects they need to take into consideration in order to keep themselves relevant, instrumental, and capable of supporting the future of learning, relearning, and unlearning experiences in a globalized setting as the 4th Industrial Revolution unwraps its presence.

A careful review of works obtained from Ebsco host and google scholar for the past five years(2017 – 2022) was done to establish the key shifts in paradigm, and practice as well as establish the challenges and opportunities at play. Key aspects informing the re-imagination are but not limited to digitization, Artificial Intelligence, Data analytics, the Information age, the Internet of things, entrepreneurship, and employability among others.

In the face of these widely appreciated aspects of daily living, teaching as has been over the ages finds itself at crossroads. In order to be an effective tool to transform the generations as has been over the years it is key for the sector to consider a review of the way it thrives in order to support today's expectations and also to help address the expectations of tomorrow which are largely anticipated but unknown. A review of the delivery, assessment, and practice of teaching is urgent and necessary across the globe to meet these expectations of the learners.

KEYWORDS: FUTURE OF TEACHING, 4TH INDUSTRIAL REVOLUTION, 21ST-CENTURY SKILLS, HIGHER EDUCATION, INTERNET OF THINGS, INFORMATION TECHNOLOGY, ARTIFICIAL INTELLIGENCE, ENTREPRENEURSHIP.

INTRODUCTION

From brick and mortar to virtual classes without corners, from what was this theory about to write your thoughts about this, these and more characterize new methods, approaches, and directions in teaching practice. Just like other sectors have been affected by the digitization tide, internet of things, the rise in the entreprenuership education demand, and now the 4th Industrial revolution(4th IR),the transformations in the education sector accelerated largely after the global Covid 19 pademic underline new dimensions in Teaching, offering parallel options from what it has been known as over the past many generations.

Teaching is moving from cases where the lecturer/teacher stands in front of the class, as learners listen. memorize and religiously take their notes which they will read to pass some examination at mid-term as an assessment of their learning. The learning is shifting from a confined on-campus model to everywhere and anywhere be it at home, at the restaurant, or in the stadium watching a match. Besides, it doesn't stop at any level, it continues for everybody, the learner and the teacher alike throughout each other's lives, with none being the monopoly over knowledge. In many settings, it no longer matters whether it is night or day, learning takes place at any time for as long as there is a learner ready to undertake it and that is their preferred time.

For some teachers, this is not what they signed up for and the demands attached to the profession in its current/evolving form have led to a mass exodus, to others, it is an opportunity to stand out and make sound contributions where they have been neglected for centuries. From how they relate with the learners, their fellow teachers, and the community in which they thrive. The technology to be familiar with while developing classes, designing curriculum, setting standards for themselves as well as building their own profiles.

1. METHODOLOGY AND RESEARCH QUESTIONS

This study is completed based on a literature review of scholarly works done in the English language on the subject matter of teaching in the technology era. This kind of study Nazir (1998) describes as data collection through studies of books, literature, records, and reports of problems solved. To inform the paper, a search was done on the Ebsco host and Google scholar databases with the use of search words Technology and education, 4th IR and education, Education 4.0, Future of learning, industry, entrepreneurial teaching & education.

These searches qualified numerous studies from across the world from which only publications, specifically those done in English and published between the years 2017-2022 were considered in forming the pool from which a sample was picked. Abstracts of the identified studies were scrutinized to establish the fit-for-purpose studies that would eventually inform the study. 10 publications were primarily considered on the basis of their scope and capacity to address three key questions that formed the basis for this study.

The questions that the study aimed at answering are:
● What are the changing learner interests?
● What is the focus of the 21st-century employer?
● How effectively can teaching be done in the foreseeable future to meet the interests of its key stakeholders-learner & employer?

The research envisaged that these questions would guide the study to a logical conclusion on how teaching should be reimagined going forward considering the past, the existent, and the imagined future social, and economic expectations that have over the years informed the basis for education and teaching in particular.

2. FINDINGS AND DISCUSSION
2.1. What are the changing learner interests?

It was unheard of, to ask learners what they would like to learn, or even when they would like to learn, but also how they would like to learn. However, (Kozinski, 2017), observes that like never before, learners today take center stage in their learning. This is partly explained on the basis of their high interest, usage, and interaction with digital tools which inform the space in which they live their lives, are influenced, and from which they make decisions. (Fisk, 2017) while referring to education 4.0 cited nine fundamental trends in the lives of current-time learners, these included; learning taking place without limits to geography, its personalization, learners making choices on how to learn, increased interest in problem-solving approaches, interest in vast exposure, more engagement with data, changes in assessment methods, learners as key players in curriculum design, in addition to increased student/learner independence. As learning takes the drift into the hands of the learner, teachers not only deserve to appreciate this but also have to afford the befitting customer experience as opposed to looking at it as a threat to their existence.

Away from learner habits are fundamental observations in learning mode preferences across the globe. In their study, Seaman et.al (2018) noted a drop in the number of students undertaking face-to-face classes in the United States. A study in India speaks to leveraging on blended learning approaches, which are supplemented by gamification, and peer-to-peer learning among others (Bansal, 2017). Relatedly, in Asia and the Middle East, online cooperation, as well as network learning were found as flexible models for the times we live in and the foreseeable future (Zhao, McConnel, & Jiang, 2009) as part of the five conceptualizations they envisaged in the education sector going forward. A similar pulse is noticed in Australia, Newzealand, and Africa, making the digital theme take both a front and center seat in the discussion about the future of education across the globe.

The adoption of technology is central to the learner choice drift, the interests in school as well as the decision of where, how, and when to learn. It, therefore, melts down to decisions of who should be able to teach them ultimately. Learners shall review beforehand the profiles of their educators and shall dictate if they would rather take a break until a better option is availed, or fill

Fig 1: Top skills demand across sectors: 2018–2022.

2018	TRENDING 2022	DECLINING 2022
Analytical thinking and innovation	Analytical thinking and innovation	Manual dexterity, endurance, and precision
Complex problem solving	Active learning and learning strategies	Memory, verbal, auditory, and spatial abilities
Critical thinking and analysis	Creativity, originality, and initiative	Management of financial and material resources
Active learning and learning strategies	Technology design and programming	Technology installation and maintenance
Creativity, Originality, and initiative	Critical thinking and analysis	Reading, writing, math, and active listening
Attention to detail, and trustworthiness.	Complex problem-solving, leadership, and social influence	Management of personnel, Quality control, and safety awareness
Emotional Intelligence, Reasoning, problem-solving, and ideation	Emotional inteligence	Coordination and time management
Leadership and social influence	Reasoning, problem-solving, and ideation	Visual, auditory, and speech abilities
Coordination and time management	Social analysis and evaluation	Technology use, monitoring, and control

Note: World Economic Forum (2018).

up the class with immediate effect. This means teachers have a duty to profile themselves every day through competitive and compelling delivery of one class after another. The customer service experience is of ultimate importance today more than ever before.

At various school levels, including University, the post-Covid 19 era has grossly boldened these realities, from mass formal school withdraws by learners to a gross exodus of teachers who found the new learning environment overlay demanding. While, unlike other professions that have been phased out due to technology, which in part explains the decisions of the learners' choices in the current space with regards to what to study, teaching as a profession is not likely to be extinct in the foreseeable future. However, the new learner trends, demands, and expectations seek that the teaching is done differently. But, how willing, ready or even prepared are the teachers to accommodate this? This is a key question across the globe, creating a sharp shortage of these resources as the demands increase and yet placed on a generation that never was high-tech engineered. The time however won't wait to have the demands addressed, as they are of both utmost impor-

tance and urgency in order to further learning, unlearning, and relearning. Teachers should find their fit and offer the desired services differently.

2.2. What is the focus of the 21st century enployer amongst graduates?

Looking at changing learner trends independently is not a sufficient measure to reimagine teaching. Teaching as has been known, and as is known in current time is charged with the responsibility of building capacities of individuals for social, economic, and political transformation. Providing for the future of labor needs, social change agents, and leadership alike. This reason is a promise that education has effectively delivered over the years. It was as simple as going to school, excelling with top grades, and being invited to a great career with a great firm. This is a true story for many that lived before the 21st century. This is fast disappearing into oblivion as graduates every day get out of school with their promised careers no more, especially when replaced by technology.

According to the world economic forum, with the rise of the fourth industrial revolution has come exponential attraction, adoption, and adaptation to tech innovations (Schwab, 2017). This has led to the coining of a set of skills that have been largely referred to as 21st-century skills. Modern firms will consider one's degree as secondary to these key skills while hiring. As displayed in Fig 1 below, these skills continue to be considered key in transforming economies globally.

As the tech advances, the most relevant skills keep changing, and what is dropped tends to be of less and no progressive sector-wide interest or importance. These skills dictate hiring and dismissal decisions in various boardrooms across the globe. To make better meaning to this debate, a reflection of how the previous revolutions affected the world of employment, but more so education and in specific teaching practice is important.

The mechanical boom of the 18th century brought about the 1st revolution, and this drove teaching in the direction of enabling the effective running of these mechanics. The later 19th and 20th centuries brought in mass production, and the use of electronics, with an early introduction of automation effectively making teaching support knowledge building across these lines. It is important to appreciate that these revolutions largely sought technical expertise to run specific machinery to improve productivity and drive up economies. At a more senior level was a desire for supervisors, regulators, and machine controllers to drive production (Poliak, Tomicova, Cheu, Fedorko, & Poliakova, 2019). As such this explains the early structuring of what became known as vocational schools that would train skilled workers with specific technical skills and Universities for supervisory, regulatory, and expert knowledge to manage skilled workers. They were two different tracks or routes aimed at producing two different categories of people at parallel ends of a production line. It is therefore not surprising that many doctors can prescribe an injection but would not have an idea of how to administer it, leaving this expertise to the nurses.

To embed these unique skills, subject matter experts were identified as instructors, and they used developed texts (printed books) to pass on skills or proven theories in management to the persons that desired them. It is worth noting that, teaching methods from prehistoric times have largely been constructed on textbook memorization, and strict discipline in order to promote literacy, mental discipline, and a good moral character

as learners were being prepared for citizenship, jobs, individual development, and success. Professional examinations at various levels would dictate the path one takes in life and for ease of classification, some failed while others passed their examinations and so progressed to the next step in life. Unlike then, when the future could be envisaged, today it is not predictable. With the onset of the 4th IR, it is largely unknown what the future holds as technology present near realities every day, who could ever imagine self-driven vehicles? Company visions and strategies change every so often and to stay competitive, with these changes come new requirements of the nature of human resources for the time in question. Restructuring of teams is more prevalent today than ever before in order to safeguard company competitiveness.

Even then, with every sector largely destabilized, education was not shaken vastly until the coming of the global pandemic-covid 19, which paralyzed schools just like other sectors for spread periods of time. An upsurge in the demands within the sector to match the times has turned many tables across the world. Teachers won't only deliver classes with theoretical facts as these are well documented online but shall use their positions to transform minds and make them more entrepreneurial, critical thinkers, and open-minded persons. Allow them to think in both real and abstract terms, collaborate with them on projects, and view them as colleagues undertaking learning together (Fisk, 2017). Tech literacy in this era constitutes in part the ability to understand the systems of mechanics and technology in the world of work, while human literacy speaks to the ability to interact well, with character and not rigidity (Aoun, 2018).

2.3. How effectively can teaching be done in the foreseeable future to meet the interests of its key stakeholders-learner & employer?

While it is true as earlier alluded to that tech advances of the time have grossly affected every sector, phasing out many. The teacher on the other hand has had their minimum practicing requirements elevated. Being a subject expect is currently at the lower rank of teaching in modern times. There is a need for constant retooling in order to become tech-friendly, build collaboration abilities and competencies, be more creative and take risks, invest in having a good sense of humor as well as be able to teach holistically.

This GenZ of learners are not only fast learners but also prefer to be directly involved in their learning and take on challenges at any one go (Kozinski, 2017). They are highly interested in advanced technologies and adapt to them as fast as they are churned out thus having a push-and-pull effect on how they should be taught (Dunwill, 2016). Born and raised in a highly disruptive environment plays out differently about their learning needs, patience, and ability to follow through long processes and lengthy texts. Teachers would have to listen to this and bend their instruction in ways that speak to the new calibre, nature of learners as fast and effectively as possible.Partly the challenge includes a mix up of learners especially those of adult age, returning to school to play catch up.

Learning technology is here to stay and Institutions of learning need to innovatively, and timelily adapt, swiftly embrace the technologies, and progressively blend, as the technologies evolve and learners continue to dictate learning options. On the other hand, the Industry is thirty for not only highly skilled individuals but also in high demand are, flexible, adaptive, innovative, sociable yet also effective employees. Fast at making decisions yet also with unique abilities to predict the future, ready to work remotely with less supervision, in their own space but very productive and result oriented. These skills for many need to be inculcated through mentorships, capacity-building initiatives, and engagements, which many employers wouldn't like to invest in leaving the choice to the employer, who then pushes the demand to the Institution/teacher.

Every moment with learners should be an opportunity for teachers to unearth from the learners the potential within them. It is evident learning is now largely student-centered and not Teacher centered. In many cases, terms such as facilitation are being used to refer to the modern time teacher. To the leaners, there are no boundaries between home and school, from a digital experience at home, the school environment is expected to offer the same platform through which learning should thrive. This defines their style, interests, attention, and drive to learn or otherwise. The rise of MOOCs is as such one of the ways to find answers where regular teachers have not found them.

It is also largely evident that for many educational institutions, the current curriculum its design, and content do not equip learners with the right skills or education for the unfolding 4th Industrial revolution. Regulators ask institutions to review curicula every 3 – 5 years in most economies, but a lot happens as learners are undertaking obsolete content. In addition to this, many developing countries face challenges such as the lack of computers, and internet access, leaving many behind at a time when they would otherwise ensure their inclusion. It is therefore incumbent upon Institutions of learning to make possible the channels that will enable effective teaching in modern time (Oke & Fatima, 2020). Often time this will not mean lone efforts which would otherwise be very expensive and defeatist but partnerships, collaboration with industry and embracing off-campus intrction methods innovatively could provide sustainable avenues.

Artificial Intelligence, capacity for big data analysis in partnership with telecom companies and research firms presents a win-win scenario where there is an observed lack of capacity but also offers a panacea for closer industry relations, thus opportunities for mutual, integration, and effective appreciation of todays' realities and predicting tomorrow' focus. Open distance learning presents itself as an elaborate alternative where mobility is challenged. Hitech automation and sophistication in the labor market underline the urgent need for careful and progresive profiling of potential resources to fill the new gaps created by the digital divide.

Towards the reimagination of teaching, blended learning plays out as an effective way to match the various generations seeking education. With the highly tech savvy and less tech savvy learners finding themselves a safe landing ground in the learning, relearning and unlearning environment. The teacher in this case is expected to be at the mediation point to offer every learner the deserving time, attention and offer timely direction.It appears that today more than ever learners can be in one class with far contradicting interests, desires and therefore the teacher should be well prepared to take on all with the demeanor it takes (Hussin, 2018). That said, it is also evident in modern time that with the evolution of ITs, they, have become more more feasible, technologically, economically, and operationally (Dziuban, Picciano, Graham, & Moskal, 2016).

Away from the largely conservative selves that teachers have been over generations, all schorlarly works cited agree that, teachers will have to be more flexibile and willing to work in multi-disciplinery teams in order to be effective at their teaching for the foreseable future (Wyrwicka & Mrugalska, 2017). These demands are by far a totally different outfit of what the teacher has been known as in the past. Teachers today

have to embrace the fact that learning starts before the classroom, continues into the classroom(both physical and virtual), and goes beyond the classroom. Teaching learners to take risks is as important as asking them to take caution as they discover case by case realities around them.

For effective learning, and certainly teaching, reviews of assessment models is another welcome discussion. Its not true anymore that answers must be found and classified as right or wrong in a timed period, many lessons will equally not be concluded in the classroom. Agreeing to disagree, is and must be welcome to teachers as a fundamental approach to teaching and assessment alike. These areas have not been broadly researched but the time for that is ripe as it is argued that assessment as it is today, the summary judgment of learners' perceived competence is highly suspect and serves the institution's interests and not those of the learner (Blakemore, 2018). Efforts should aim at building capacities and not crushing them under the guise of poor grades.

3. LIMITATIONS AND AREAS OF FUTURE RESEARCH

The study met some notable limitations such as: – articles not published in English, those inaccessible through google scholar and Ebsco host, and yet also those that were not open access or otherwise subscribed to by my university, these were eliminated in my scope. A deeper analysis of these may give a related study more precision on the future of teaching as deduced in this study.

Therefore, given this background, a more detailed study could be done to come to more precision with regards to this study area. Given the diversity of approaches realized while taking the samples for the study, case-by-case approaches can help inform national strategies while broader studies can help incorporate education internationalization interests, especially now that globalization offers fresh realities across borders.

CONCLUSIONS

Using literature from various studies, this study examined teaching modalities in the 21st century at the onset of the 4th Industrial Revolution. These conclusions have thus been made following the study.

First, the student profile has largely drifted from a conservative, disciplined and wait to be taught character to an ascertive, tech savvy, self aware learner thereby inviting a new approach to their learning. This however the study appreciates is not a total tide as there are still may learners that appreaite the conservative approach to learning. This paired with the fast-rising interest in new ways of learning gets this study to the conclusion that teaching should be sensitive to both conservative and conventional learners' interests and provide for them without judging or depriving either. Teachers will have to embrace a personalized approach to teaching.

Secondly, the study realises that employers' demands of fresh graduates from school is changing vastly. From an emphasis on academic skills and abilities to a focus on social, innovation, and entrepreneurial skills and abilities. This shift presents a need to rethink how instruction is done, not to give away the academic value it brings on board as this is important but also to invite methodologies that will imbue in learners the much desired social skills to increase their prospective contribution to the world before them. Today' and more so tomorrow's teachers should be able to incorporate these in their conscious and subconscious delivery menu.

Thirdly, given the technology advances, changing learner profiles, and employer needs, Teachers have to keep themselves constantly abrased with the times. They take a more active role of the facilitator, must embrace collaboration, and be able to ignite their learners to ready them for both the known and the unknown future that they plug into.

Fourth, since teaching goes hand in hand with assessment, there is an urgent need for a review of assessment for effective teaching to be ensured. This should focus on skills such as creativity, critical thinking, and decision making among others.

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