A Point of View on Rethinking the Role of Technology in Education

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Abstract: Education is undergoing a transformation due to the integration of technology. There are divergent opinions among educationists regarding this integration. Some advocate for a cautious approach, integrating technology while retaining traditional teaching methods. Others believe that technology has the potential to completely revolutionize education, with teachers becoming facilitators. Both perspectives have their merits and drawbacks. It is crucial to critically analyse and reimagine education in the context of this technological world. How should education be reinvented and adapted to the evolving technological landscape? What does the future of education look like? This paper aims to explore these questions and offer insights into rethinking education in the technological era.

1 INTRODUCTION

Education has always aimed to prepare students for the future and equip them with fundamental skills. Traditionally, classroom-based training and written assessments were the primary methods employed. However, in the past 50 years, rapid changes in the economy and technology have profoundly impacted education and all aspects of human life.

During the industrial revolution, education adapted to meet the demand for specific skills. However, the focus remained on teachers delivering education to all students in a mass setting, utilizing traditional classroom methods and written assessments. As time progressed, teaching and learning shifted towards programmed instructions, emphasizing outcomes rather than the learning process itself, in line with the 'Behaviourist theory of learning'.

Technological advancements over the past two decades have revolutionized various domains, including education. The widespread integration of technology in education, along with a growing focus on learner-centred approaches, has transformed the education landscape. Learners have become the centre of teaching, with the aim of achieving optimal learning outcomes. The 'Cognitivist theory of learning' describes how learners mentally synthesize the learning process, leading to the development of simulations and intelligent systems (Collins et. al 2018).

However, there are differing viewpoints on the impact of technology in education. Enthusiasts see immense potential in technology integration, while sceptics raise concerns and question its effectiveness in conventional teaching approaches. Some, like Prensky, advocate for replacing teachers with technology, allowing digital natives to teach themselves (Prensky 2008). Others argue for incorporating technology tools into effective instruction. Understanding and finding common ground between these perspectives is crucial for improving learning outcomes.

The introduction of digital technology, or ICT (Information and Communication Technology), has brought about significant changes in education. These changes include reimagining the role of teachers as facilitators rather than central figures, shifting from unidirectional teaching to collaborative approaches, transforming students from passive to active learners, and redefining the roles of parents and society through educational technology.

While many of these changes hold promise, empirical research identifies both positive and negative aspects. This paper aims to evaluate the intersection point where the benefits of educational technology can be harnessed while mitigating any negative effects. By examining various viewpoints, the paper seeks to provide valuable insights on achieving a balanced approach to educational technology implementation for enhanced learning experiences.

2 TECHNOLOGY SCEPTICS' ARGUMENT

The integration of technology in education has garnered attention and generated debates among skeptics. Technology, broadly defined as tools and systems that simplify processes and improve outcomes, has been utilized by humans since ancient times to enhance their lives. In the 20th century, the concept of digital technology emerged, revolutionizing various aspects of society, including education.

During the Industrial Revolution in the early 1800s, education experienced a significant transformation. The need to train the masses for industrial jobs led to the emergence of an assembly-line-like approach, where education became centered around a teacher imparting knowledge to a large group of students. However, critics argue that this traditional teacher-centric model does not optimize learning for most students. Simply imposing education upon learners may not lead to meaningful understanding and growth (Stratform 2019).

Bernard Stiegler, a prominent philosopher, challenges the prevailing education system, suggesting that alternative methodologies, such as Massive Open Online Courses (MOOCs) and action-based research, offer promising pedagogies that effectively integrate technology while maintaining a focus on the learner. Stiegler's viewpoint emphasizes the importance of carefully incorporating technology to ensure a gradual and purposeful integration that prioritizes the learner's needs (Kinsley 2013).

Another group of skeptics' voices concerns about the potential negative consequences of technology integration in education. They argue that as technology invades classrooms, students may experience a decline in creativity and passion. The use of traditional tools such as pen, and paper engages students' senses and fosters a sense of creativity that drives their learning forward.

To explore the skeptics' perspective on technology integration, let's examine a case study of a K-12 school in the United States. This school in Arizona initially adopted a blended learning model, combining in-person instruction with technology-assisted lessons. Over time, the reliance on technology increased, allowing students to learn at their own pace. Initially, this approach yielded positive outcomes, as test scores improved. However, after a certain period, student achievement began to decline, and a general lack of knowledge and learning became apparent (Kusano et. al. 2013).

Upon closer analysis, several key factors contributing to these issues were identified. Firstly, students spend excessive time on computers, reducing opportunities for group activities and outdoor experiences that promote holistic development (Cain et. al. 2010). Secondly, there was a lack of in-service teacher training on effectively balancing technology integration and education. Teachers needed support in guiding students to be motivated by learning rather than solely focusing on technology. These findings highlight the importance of maintaining a balance between educational practices and technology integration.

Historically, studies often emphasized the digital divide, which referred to the disparity in access to technology. However, by 2015, access to technology and the internet had become nearly universal. During this period, a large-scale study conducted across OECD countries examined the impact of technology integration in education (OECD, 2015). While ICT (Information and Communication Technology) usage increased both within and outside of schools, there was a slight degradation in student achievement when compared to traditional paper-based assessments and teaching methods. Moreover, excessive internet and technology usage were found to negatively affect sleep patterns, physical activity, and social well-being.

These observations raise questions about the expectation that technology will revolutionize the learning experience and promote a deeper understanding. Critics argue that the ways technology is used in education may not align with its potential benefits. Social issues related to technology integration, such as reduced personal interaction and social skills development, may not be adequately addressed. Additionally, technology-driven learning may hinder learners' ability to gather information independently and comprehend subjects holistically, a concept referred to as "intellectual inertia." (Selwyn 2017).

While there have been studies highlighting the positive impact of technology in education, a comprehensive and large-scale analysis, akin to the OECD study, specifically examining the effectiveness of technological integration in education, is yet to be conducted. Numerous studies also indicate potential negative effects on creativity and the development of a well-rounded learner.

3 TECHNOLOGY ENTHUSIASTS' ARGUMENT

Digital technology integration in education is driven by the need to stay updated in the modern information society. It allows learners to keep pace with societal and economic changes. Furthermore, educators emphasize the internal motives behind incorporating digital technology, as it is believed to enhance pedagogy and improve learners' abilities. Extensive research supports the positive impact of technology integration in classrooms, including increased learner interest, subject achievement, classroom interaction, and the broader reach and delivery of education (Stoic 2015).

One area of focus is flexible learning and its transformative effects on traditional schooling. Collins and Moonen's 2001 flexible learning model predicts a complete overhaul of the traditional classroom as digital technology becomes more integrated. This shift from Scenario A to Scenario D envisions learners choosing their own paths, with learning and interaction taking place in the limitless digital world, unbound by physical classrooms.
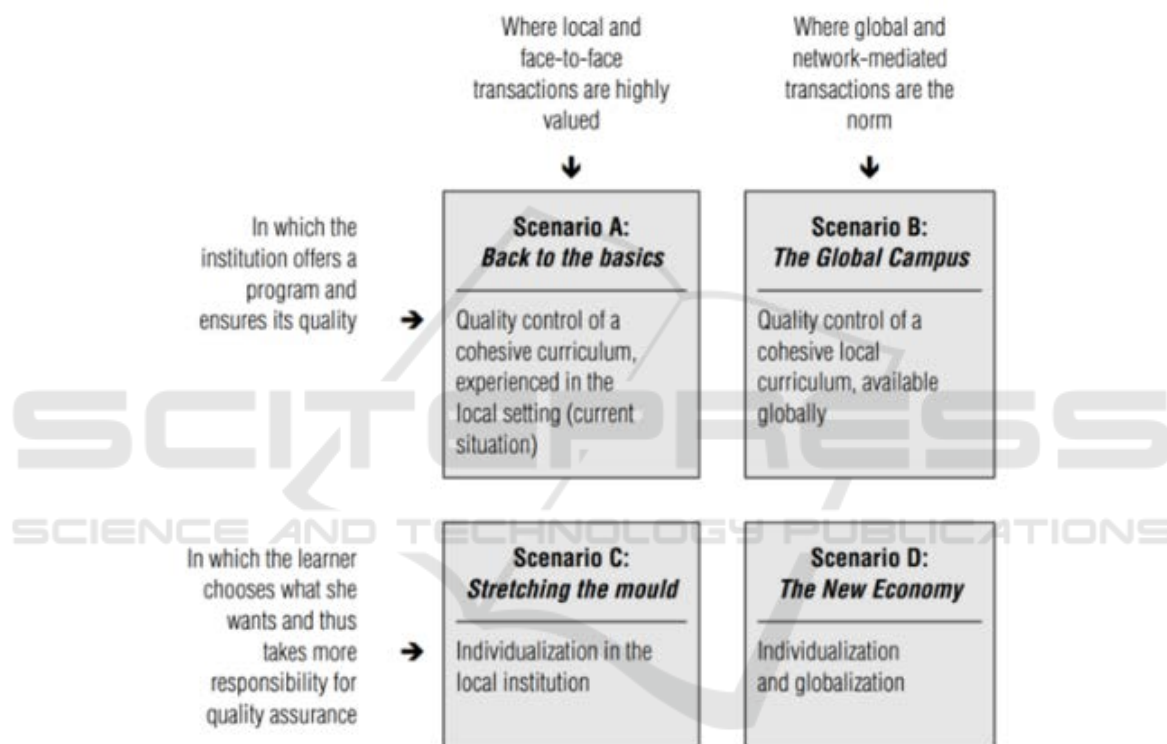

Figure 1: Collins and Moonen's 2001 flexible learning model detailing Scenarios A through D.

The internet and the World Wide Web have also opened doors to freedom and fairness in education. With virtual classrooms and unlimited connectivity, barriers such as financial constraints, geographical distance, and the pace of learning are being dismantled through digital technology and innovative learning approaches. Some educators even discuss the concept of "de-schooling," where

digital technology provides an alternative to the confines of traditional schooling, including curriculum, assessment, and qualifications. They envision a future where education moves away from classroom-centered teaching to a mobile-based model, allowing learners to progress at their own pace (Stosic 2015).

In this technology-enabled educational environment, the focus shifts away from a teacher-centric approach. Open Educational Resources (OER) and similar web content empower learners, placing authority and control in their hands. This learner-centered approach fosters independent exploration and personalization of learning experiences. The integration of digital technology in education represents a transformative shift towards a more flexible, inclusive, and learner-centered approach. By leveraging the power of technology, education can adapt to the demands of the modern

world, providing learners with the necessary skills and knowledge to thrive in an ever-evolving society. It is essential to embrace these changes thoughtfully, ensuring that technology is effectively harnessed to enhance educational experience while maintaining a balance with traditional teaching methodologies. With careful consideration and strategic implementation, digital technology has the potential to revolutionize education, empowering learners and preparing them for the challenges and opportunities of the digital age (Kolb 2017).

4 CONCLUSION – RETHINKING EDUCATION

In the battle between technology skeptics and enthusiasts, it is becoming increasingly challenging to keep technology out of classrooms. The evolving world we live in demands that learners embrace new technologies to stay up to date. Digital technology plays a vital role in various aspects of education, including learning about abstract ideas, providing a powerful social resource in individual learning contexts, and driving educational reforms such as distance education and innovative teaching methods.

However, it is important to note that most learning theories and pedagogies were not developed with the advent of digital technology in mind. While these theories acknowledge the connection between learning and technology, the introduction of real-life games like "Second Life" or "World of Warcraft" has not been fully explored within these frameworks. Evaluating and adapting existing learning theories to the context of digital technologies and ICT poses a significant challenge, especially considering the future impact of Artificial Intelligence on education.

Another crucial aspect to consider is the role of teachers. Will teachers eventually be replaced by smart systems? Currently, technology is expected to enhance the role of teachers by introducing better teaching methods and pedagogy. Teachers can leverage technology to shift between individualized and communicative forms of instruction as needed. The role of teachers is undergoing a significant transformation, but their importance in facilitating learning and the impact they have on learners will never become obsolete. Teachers remain indispensable in elementary education, where a focus on keeping learners away from technology promotes creativity and the early stages of learning and development (Kusano et. al. 2013). Zooming in on the adoption of ICT/digital technology in education

today, it is crucial to understand the concerns of teachers regarding technology integration. Strategic concerns about job impact and performance, as well as resistance to learning new technologies, are valid considerations. It is essential to support teachers in integrating technology into their teaching styles while prioritizing student interests. Instead of implementing technology in every aspect of teaching and making it the centerpiece, informed decisions should be made to integrate technology where it enhances the learning experience. This may involve adopting situated learning for active and collaborative peer-to-peer learning, gamification techniques, multimedia, and other technologies that impact the learning experience positively (Selwyn 2017).

The main challenge lies in whether 21st-century schools can adapt and incorporate technology-driven learning for future generations. If educators fail to integrate new technology into the school system, the long-standing association of schooling with education will become a concept of the past. Students with the means and ability will seek learning opportunities outside of formal schooling. According to the science of learning, sustained interpersonal relationships, emotional connections, interactive hands-on learning, and experiential learning are crucial for effective learning. Technology should facilitate real in-person relationships and peer-to-peer networks, rather than isolating individuals behind screens.

Looking ahead to the future of education in the 21st or 22nd century, the elementary schooling system is expected to remain unchanged. Young learners should not be confined to computer screens for their education. Instead, alternative forms of schooling, such as home schooling, learning centers, workplace learning, or distance education, will emerge. These alternatives will redefine the role of public schools and their involvement in the education of children and adults.

Therefore, technology should serve as a scaffold for group participation in the teaching and learning process, rather than being the pivotal focus. Digital screens are not the new teachers, chalkboards, or textbooks. Technology should complement and supplement student-teacher interactions, enabling effective teaching and learning experiences.

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