The Digital Evolution- need to adapt education for a Tech-Savvy Generation

Iris Billy
Medgar Evers College, City University of New York, USA

Hannah Anush
Campbellsville University. USA

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Digital evolution, Education technology, digital classrooms, online, e-learning, real time education, digital literacy, technological shift, student engagement.

Abstract
Technology and innovation have impacted all industries and education is not exempt from this change. Organizations in different industries are constantly re-inventing their competencies and capabilities based on the technological upgrades that are being introduced into the markets; however, the change in education has not seen a drastic shift as it should. The current generation of scholars are exposed to technology from an early age (Manchanda, & Arora, 2023) and are equipped with tech-savvy devices that they are capable of using efficiently; can education leverage this skill in students to impart knowledge and improve their capabilities. This study aims to understand the gap in digitalization of education and propose various mediums and methods to adapt curriculum to engage students. Recent literature will also be reviewed as part of the study to gather evidence regarding empirical studies that have identified the need for technological adaptations, the benefits derived, and process followed to accomplish the same. There are a multitude of factors that must be considered to transform the education system through digitalization; as it certainly is not a simple process; the need to implement technology, students' expectations, alignment between course content and technology, instructors' ability to adapt to the change are some key factors that will impact this digital evolution in education. A vital purpose for conducting the study is also to evaluate the need for the suggested changes in education as current students are the future workforce who must be aware of technology, as it makes them employable in organizations; a digitally enables study environment trains students to utilize their technological skills so they can be transferred to organizations when they graduate and seek job opportunities (Murniarti, Simbolon, Purwoko, Fatmawati, & Hariyanto, 2023).

Introduction

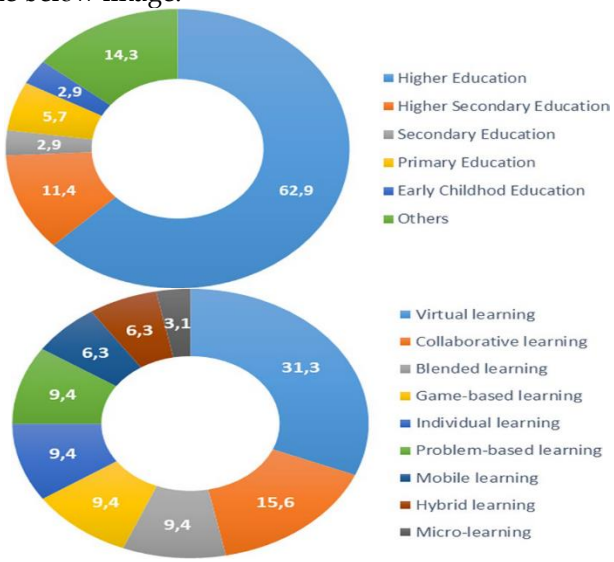
The current generation of students, namely Gen Z's (born between 1996 to 2010) and Gen Alpha (born between 2010 and 2025) have a unique set of skills in terms of technological acumen. They are introduced to technology at a very young age, technological devices like mobile phones, I-pads, laptops, and gaming consoles have become an integral part of their life. The adeptness of using digital media to communicate, being members on a multitude of online forums and constantly upskilling themselves to stay connected to the digital world are all unique characteristics of the current generation of students. These extreme changes that have taken place in recent decades have created a gap between the students and the education system, as contemporary curriculums and ways of learnings do not challenge and engage the students of recent generations. Although education systems have updated themselves to cater to the rising demands of the current generation students, there still seems to be a gap when compared to other industries that have adopted digitalization. Digitalization of education can be viewed as a multifold approach of updating the course content based on technological advances, adapting newer teaching methods, and implementing online classroom models so the students are equipped to transition smoothly into the workforce after they graduate. For the purpose of the current study, secondary research was conducted by reviewing empirical literature from recent years to identify the need for learning systems to implement digital technology and

primary research was conducted by interviewing students from different backgrounds of academics, varied age groups, pursuing their education in different levels; the data was collected, segregated, and analyzed to compute our findings that support the research.

Literature Review

Ahmed et al discusses the prominence of the implications of metaverse, and how educators can utilize technology to engage with the present generation of students. The multitude of available technologies included in the metaverse are listed as virtual reality, mirror world, embodied internet, post-reality simulator, digital virtuality, artificial intelligence, and lifelogging (Tlili, Huang, Shehata, Liu, Zhao, Metwally, ... & Burgos, 2022). Various keywords were strategically searched for, to comprehend the use of metaverse in educational research and the trend was observed as increasing over the recent years. E-learning, virtual reality, avatars that appear in simulations to interact with students, and interactive computer graphics all create a unique experience for learners. These interactive and immersive experiences ensure that students stay connected to the sessions, while tailoring content according to individual needs, interacting to receive real-time feedback, imparting knowledge relating to the course content as well as knowledge related to technology. The study reaffirms that using metaverse for educational purposes; as it expertly intertwines virtual world with physical classrooms and creates astonishing new possibilities for cooperative, collaborative, problem-solving learning possibilities (Araya, & Avila, 2018). These blended learning platforms do not eliminate the traditional lectures and training but suggest complementing these sessions with technology-based experiences like game-based scenarios for learning created and monitored by teachers.

The different levels of education and types of digital learning options that have been found in recent literature are depicted in the below image.



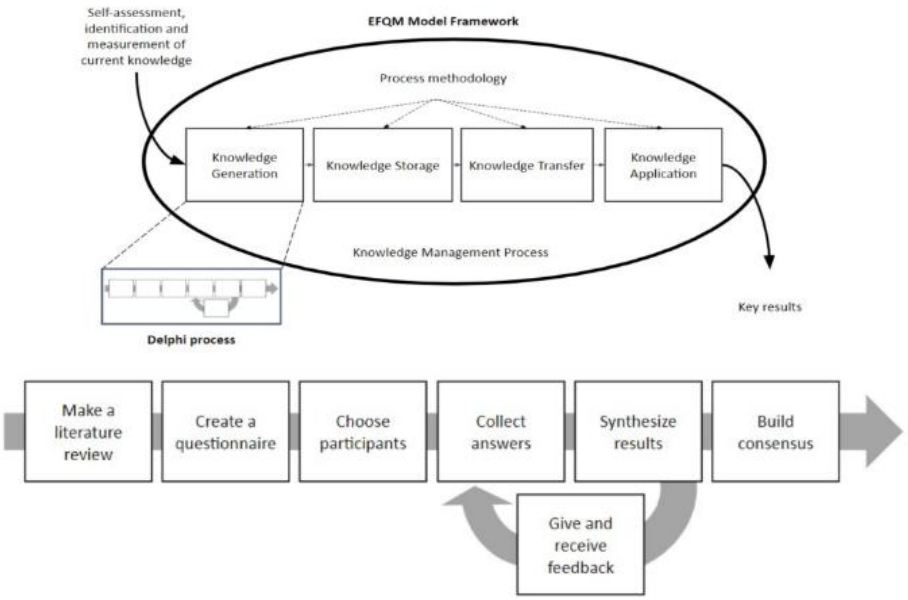
Source: Conference On Child-Friendly Education (ICCE) 2018. Tlili, A., Huang, R., Shehata, B., Liu, D., Zhao, J., Metwally, A. H. S., ... & Burgos, D. (2022). Is Metaverse in education a blessing or a curse: a combined content and bibliometric analysis. Smart Learning Environments, 9(1), 1-31.

The authors discuss the learning process and habits of present generation students like Generation Z and Generation Alpha (at schools in Indonesia) and the importance of updating the learning system to make it more appealing and interesting to students. Key take aways from the paper are the need to create an attractive classroom with digital technology, opening up positive digital technology utilities for students and moving up the benchmark for learning success using technology. The authors have studied the nature and habits of the newer generation, which are tech-dependent, multi-tasking, and the keenness to always stay connected and have access to abundance of information online (Hariadi, Bambang, and Pantjawati, 2016). Globalization has revived many industries and education is not exempt from this radical change; as the users have updated themselves with technological advances, it is vital for the education system to keep

up by updating the methods with web technologies to ensure improvement in quality of education and the ability to bridge the gap between education and employability. The implementation of digital classrooms and online learning can improve the standard of education, help teachers and students to advance, and lead to cost reduction by introducing flexibility in learning.

The advantages of adopting digital education systems have been elaborately researched by the authors Van et al. and these are specifically gained by the implementation of technology in learning organizations. The importance of knowledge management and transfer, intellectual property gathering and processing, and creating digital scholars are explored in this paper. Enormous amounts of data are generated for the purpose of education, the data is compiled of learning materials, course content, student-teacher interactions, student progress, outcomes of the learning, future needs for improvement in the content and feedback from students; with the application of digitalization in education, this data can be gathered, stored, and processed for a multitude of benefits for the organizations, teachers, and students. Digital education can also assist in improving research, provides input for scholars, and knowledge can be converted into a capital asset.

Higher education institutions (HEI) are in dire need to manage knowledge in order to bridge the gap present in the transition phase of students into workers. Efforts including automation, augmentation and digitalization of learning systems have been adopted by institutions (Argôlo, Miranda, Pagliusi, Lima, Santos, Barbosa, & Souza, 2022). The future of the students who complete higher education needs to be taken into consideration by universities and organizations while designing the curriculum and the knowledge imparted to students in HEI must be capable to being transferred to the jobs in the future. The learning model developed must ensure all these checkpoints are met successfully, to establish success criteria for students. It is crucial for institutions to keep up with the demands of organizations in terms of the skillset developed by students, the trends that are adopted by organizations, so students are up to date when they are onboarded to their first jobs and transferring educational knowledge into practical situations and problems.



Source : Calvo-Mora, A., Navarro-García, A., & Periañez-Cristobal, R. (2015). Project to improve knowledge management and key business results through the EFQM excellence model. International Journal of Project Management, 33(8), 1638-1651.

The above image depicts the EFQM (European Foundation for Quality Management) model described by Calvo-Mora et al. as a framework to implement for quality management, this model can also be applied to education systems to manage the standard of curriculum, improve the same to ensure

adherence to market standards of employability and guide educators through the knowledge management process efficiently (Calvo, Navarro, & Periañez, 2015).

Technology-Enabled Learning in Action

According to Amirian, (2007) learning principles transcend specific technologies. However as per Amirian, (2007), when carefully designed and thoughtfully applied, technology has the potential to accelerate, amplify, and expand the impact of powerful principles of learning.

This concept of technology-enabled learning encompasses a range of skills and literacies that can include internet safety, privacy and security, cyberbullying, online reputation management, communication skills, information literacy, and creative credit and copyright Amirian, (2007).

According to Hsu, P., & Sharma, (2008) few ways technology can improve and enhance learning, both in formal learning and in informal settings.

1.Technology can enable personalized learning or experiences that are more engaging and relevant. Mindful of the learning objectives, educators might design learning experiences that allow students in a class to choose from a menu of learning experiences—writing essays, producing media, building websites, collaborating with experts across the globe in data collection—assessed via a common rubric to demonstrate their learning. Such technology-enabled learning experiences can be more engaging and relevant to learners.

2.Technology can help organize learning around real-world challenges and project-based learning – using a wide variety of digital learning devices and resources to show competency with complex concepts and content. Rather than writing a research report to be read only by her biology teacher and a small group of classmates, a student might publish her findings online where she receives feedback from researchers and other members of communities of practice around the country. In an attempt to understand the construction of persuasive arguments, another student might draft, produce, and share a public service announcement via online video streaming sites, asking his audience for constructive feedback every step of the way.

Statistical Data

Participants

A total of 59 students completed the questionnaire via Survey Monkey after qualifying for participation in the study. The age range of the students who participated in the study is 18 to 28. The data were collected from undergraduate 33% of the students who were freshmen, 32% sophomores, 20% juniors, 10% seniors and 4% were graduate students or post-graduates More females than males answered the questionnaire, (28% male and 72% female). The majority of students were Americans (99%), and 1% international students.

Materials

The survey used for this study was based on the "Experience with technology" survey (Kennedy, Krause, Judd, Churchward, and Gray, 2006) This survey used the same three sections as Kennedy, Krause, Judd, Churchward, and Gray's (2006) survey. The first block asked students about their access to technology; the second block presented questions about computer use. The third section asked students' experience with computer technology in university as per Kennedy, Krause, Judd, Churchward, and Gray) and how well they felt they had been prepared for college. In addition, my survey included another block of questions focused on issues of computer maintenance, and how satisfied students have been with their computer use in college. In addition to the sections about computer use, the survey included information about students' demographics. Information for participants' gender was collected in order to find out if computer knowledge and habits are gender specific. The questions concerning computer knowledge and habits were categorized in four different blocks. The first block was dedicated to collecting data concerning student's access to technology in college in high school. Students were asked what kind of techno devices they owned, such as computers, laptops, and smart phones. The second block of questions was aimed at questions about students' experience with and knowledge about computer technology in college. This section was designed to collect data that could provide information about the role of computer technology

in their daily life and students' experience with a variety of software. The survey focused on questions about ownership of different devices such as laptops, cell phones, as well as students' use and experience of computer technology. For example, questions asked how many hours students spend using computers for different tasks, like surfing the web, doing homework, emailing, chatting, and how experienced they are with various kinds of software. The third section was designed to collect data about students' access to technology and computer education in college. This part of the survey probed students' prior computer education and how computer use influenced their use of and knowledge about computer technology in college. Questions in this section of the questionnaire included questions such as "How frequently did you us a computer during your time in college," what kind of computer classes did you have in college," and "please list the kind of computer technology you used in the classroom." In addition, open-ended questions in which students were asked if they thought their knowledge about computer technology has improved and if there were computer skills they had wished to have learned in high school before entering college. The last section concentrated on acquiring data concerning students' overall and extended interest in and knowledge about computer technology including questions about computer maintenance.

Design/Coding

Data collection took place in March of 2024 and the results were tested for female and male differentiations, but t-Tests showed that gender differences were insignificant, so gender differences were not considered in this study. Similarly, t-tests of differentiations among students of different age groups were also insignificant, partly due to the small sample size.

Bringing Equity to Learning Through Technology

Closing the Digital Use Divide

As per Iiyoshi, Hannafin, & Wang, (2005) traditionally, the digital divide in education referred to schools and communities in which access to devices and Internet connectivity were either unavailable or unaffordable. Although there is still much work to be done, great progress has been made providing connectivity and device access. As per Iiyoshi, Hannafin, & Wang, (2005) we have to be cognizant of a new digital divide—the disparity between students who use technology to create, design, build, explore, and collaborate and those who simply use technology to consume media passively. On its own, access to connectivity and devices does not guarantee access to engaging educational experiences or a quality education (Iiyoshi, Hannafin, & Wang, 2005). Without thoughtful intervention and attention to the way technology is used for learning, the digital use divide could grow even as access to technology in colleges increases.

Digital learning tools can offer more flexibility and learning supports than can traditional formats such as using mobile devices, laptops, and networked systems, educators are better able to personalize and customize learning experiences to align with the needs of each student. Iiyoshi, Hannafin, & Wang, (2005) can expand communication with mentors, peers, and colleagues through social media tools. Digital tools also can make it possible to modify content, such as raising or lowering the complexity level of a text or changing the presentation rate.

Roles and Practices of Educators in Technology -Supported Learning

Technology can empower educators to become co-learners with their students by building new experiences for deeper exploration of content (Iiyoshi, Hannafin, & Wang, 2005). Educators must take full advantage of technology to transform learning requires strong leadership capable of creating a shared vision of which all members of the community feel a part. Leaders who believe they can delegate the articulation of a vision for how technology can support their learning goals to a chief information officer or chief technology officer fundamentally misunderstand how technology can impact learning. Technology alone does not transform learning; rather, technology helps enable transformative learning. The vision begins with a discussion of how and why a community wants to transform learning. Once these goals are clear, technology can be used to open new possibilities for accomplishing the vision that would otherwise be out of reach. As we move to learning enabled by technology can mean a shift in the specific skills and competencies required of leaders Iiyoshi, Hannafin, & Wang, (2005). Education leaders need personal

experience with learning technologies, an understanding of how to deploy these resources effectively, and a community-wide vision for how technology can improve learning.

Limitations

The findings from the study have not been validated externally as findings may vary depending on the nature of educational institutions (technology, management and science universities may have a higher score); similarly other geographical locations may yield a different set of results based on their socio-economic factors, developed, or developing countries may significantly vary in technological advances, backgrounds of students, and infrastructure. The study is also bound by time, as the current state only could be determined due to limitations in time, a suggestion for future researchers can be to extend the study to a period when the students have transitioned to the workforce to determine their readiness for organizations, and if there was any gap in their knowledge identified during the process.

Conclusion

The timing has never been better for using technology to enable and improve learning at all levels, in all places, and for people of all backgrounds. Educators, policymakers, administrators, and teacher preparation and professional development programs now should embed these tools and resources into their practices. As educators work in collaboration with families, researchers, cultural institutions, and all other stakeholders, these groups can eliminate inefficiencies, reach beyond the walls of traditional classrooms, and form strong partnerships to support everywhere, all-the-time learning. Although the presence of technology does not ensure equity and accessibility in learning, it has the power to lower barriers to both in ways previously impossible. Technology allows greater communication, resource sharing, and improved practice so that the vision is owned by all and dedicated to helping every individual in the system improve learning for students.

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