The effective use of technology in international education classrooms to enhance and transform learning

Paul Walton MSc
Nadeen International School, Bahrain
Email: p.walton78@icloud.com

Abstract - Technology's pervasiveness has a wide range of positive and negative effects on society, which extends to the field of education. The manner that material is presented and taught in the classroom has been significantly altered by technology; this essay focuses on elaborating on those implications (Jabbarov, 2020). Education has transformed thanks to technology. While professors utilize technology to increase the impact of the teachings, students have computers and other devices to aid with college work and simple access to research tools and other relevant information. MOOCS (Massive online open courses), have grown considerably through the use and accessibility of technology. Class central (2021) state that there has been an increase form 330,000 learners to over 220 million in the last 10 years., in 2021, 40 million users signed up for a course. Technology, however, makes it possible for students from all nations to participate in online activities that ensure research sharing. An article by Campustechnology (2017), stated that over 94% of students actively want to use their smartphones in education to collaborate, research and complete their studies. They believed it helped them to have greater ability to 'learn and retain information'.

Index Terms – e-learning, technology, traditional classroom,

Contents –

1. **Introduction**
2. **Effective use of technology**
3. **Role of technology in education**
4. **The positive side of using technology in international education**
5. **The negative side of using technology in international education**
6. **Conclusion**

1. Introduction

Modern educational technologies and the models and practices supporting them are now essential to teaching and learning. They have also experienced a significant (innovative) expansion in the higher education sector. Many higher educational institutions (HEIs) aim to invest in digital technology to support the different teaching and learning processes and curricula (Jabbarov, 2020). It has been argued that using technology in clinical settings and the fundamental sciences should be promoted and even integrated into students' everyday routines. According to the Digital Education Awards (2022), 89% of colleges and universities now allow

their students to use their devices on site, 85% of students are allowed to use personal devices on their school networks and a further 27% allow complete open access to their network. The use of the internet and BYOD (Bring your own device) are an integral part of educational institutions.

The Internet is the most significant component that enables the employment of technology in the educational system (Al-Hariri, and Al-Hattami, 2017). One of the fastest-growing educational trends is e-learning, which offers a viable substitute for conventional education. Technological advancements across all spheres of life have the potential to expand job prospects while displacing those who lack the necessary technological abilities (Jabbarov, 2020). Governments, academic institutions, and other educational stakeholders have created policies to aid students in learning fundamental technical skills and employing technology to deepen their comprehension of various ideas (Jabbarov, 2020). Many institutions in the education sector have embraced technology to enhance student interaction, aid in conceptual understanding, and use it for instructional purposes (Al-Hariri, and Al-Hattami, 2017). Through digital television and video conferencing, technology allows students to connect freely with programs and other students. Students can learn about different cultures and study the subjects more thoroughly by engaging in such interactions at their own pace. Therefore, it is clear that technology has a significant influence on education. In light of this, this publication analyses how technology is effectively impacting education, the educational technology available and the increase in investment in such tools.

2. Effective use of technology

Technology can be used frequently in the classroom on a daily basis, and occasionally this can be used to substitute tasks that already can occur without the use of technology. According to EdTechMagazine (2019), a study showed that 48% of students used a desktop version of computer and 42% used smart phones in the classroom worldwide. In the same research, it shows that 75% of US classrooms use desktop computers. A significant study highlighting the use of computers across the world of over 20,00 students and teachers from over 100 countries, to emphasise the sheer volume of devices in schools and how they continue to increase annually.

An article by Campustechnology (2017), stated that over 94% of students actively want to use their smartphones in education to collaborate, research and complete their studies. They believed it helped them to have greater ability to ‘learn and retain information’. Frontiersin (2020), stated that pre-schoolers spend over 2 hours per day with screens in the United Kingdom, United States, Portugal and Australia. The trend showing screen time increasing. In a study regarding schools in Greece, Papadakis (2019), showed over 95% of parents responded that their children (Of pre-school age) used a device daily or almost daily.

The increase of cell phones from 35% to 85% has referred to by Pewresearch (2021), this increase over 10 years has now led to mobile devices being readily accessible to all. Over 95% of teens have access to a smart phone in the US. This has led to more students having access to devices that include combined technologies enabling students to use aps, the internet and several functions that can be used educationally. The access and opportunity to use the devices

is available. In the UK, according to the Guardian (2020), 53% of youngsters by the age of 7, owned a smart phone. By the time they are 11 years old, over 90% of students surveyed said they owned a device.

From early childhood, around 83% of children from 6 months to 6 years use screens every day according to Child Encyclopaedia (2016). This was also confirmed by the Erikson Institute (2016), which reported a '*study of 1,000 parents across the country, the most current snapshot of technology use among children in this age group today, 85 percent of parents reported that they allow their young children to use technology. Television, tablets, smartphones, and computers were the most popular. More than three quarters of those surveyed said that they use technology along with their child on a daily basis for up to two hours.'*

Both reports show the high amount of technology and screen time exposure that early childhood infants are exposed to.

There is an overall increase in the number of education establishments using technology, schools and classrooms increasing the accessibility of technology for students.

The effective use of technology can be defined when technology 'adds value' to a task that could not have been completed before. Extending this further, a powerful way of using technology to undertake tasks and activities that were unable to be designed yet alone implemented in the past. A summary of this would be that technology enables the use of new activities, new ways of approaching these together with new ideas that were unable to be conceived without the use of devices in the classroom. According to Prensky (2018), technology should be used for things 'that kids couldn't do in the past', he lists examples showing real time interactions, analysing big data, creating simulations etc.

The SAMR Model, as developed by Puentdura (2006), is a 4-level taxonomy showing how and when to select and utilise the use of technology. In the substitution level, the tech choice replaces the normal task and the effectives of the technology against the regular task does not provide any change in what the students can do. This level is least effective in the model. The next level up is the augmentation stage which again replaces the activity but this time adds noticeable functional improvement. The third and fourth stage of the model look at the opportunity to redesign the original task and the creation of new tasks. Users should be aiming for the modification and redefinition levels of the 4-level model to redesign and create opportunities that were not available previously. Aiming for the top 2 levels to 'transform learning' gives a clear scope for use of technology that fits into both Prensky and Puentdura viewpoints. 3plearning (2020), gives an explanation of the SAMR model and 15 practical examples showing how students connect, publish, record and experiment as they learn with technology. Emergingedtech (2015), show a step by step guide and examples of the tasks and how they change at each level, demonstrating the difference in how the tasks are enhanced and then transformed. This can be used as a guideline for schools as a quality control or 'check' against the level that they are aiming for to ensure that technology is not used for no particular reason. An example of an art lesson is discussed through the lens of the substitution level, a digital drawing package can be used to directly use technology, the task changes to add

functionality through augmentation, with layers, backgrounds to further modify the task and then redefining the task by creating a collaboration online so that other students can join in at any time to contribute and then publish to share wider.

The TPACK model supplements the idea of the use of tech in class but with the reminder to create a foundation for any edtech integration. According to Mishra and Koehler (2006), the use of technological, pedagogical and content knowledge are triangulated and support educators to work within this complex space. Powerschool (2022), produced a range of examples to show a breakdown of this triangulation in the TPACK model and what a science lesson would look like when integrating technology into a classroom effectively. It covers the point of the TPACK model is to understand 'how to use technology to teach concepts in a way that enhances student learning experiences'. This shows that digital tools alone are not the answer to improving learning outcomes and that pedagogical and content knowledge blend together to support the delivery of this. The goal is to be purposeful in applying all three types of knowledge from the TPACK model.

November (2013), refers to how students can take control of their own learning and how tech can play a role this this. His approach of enabling students to direct their own learning fits with the effective use of technology in the classroom, they can 'help one another, connect and collaborate globally'. Helping students to understand the world around them through the use of digital literacy and applying digital information safely and wisely. The models mentioned previously put learning at the centre of the activities and focusing on the 'learning' not the technology.

Using the models and research above, these can be directed to reference 'effective' the use of technology in the classroom.

3. Role of technology in education

Peers can engage with students worldwide by using technology to access online learning increasing the accessibility to interact with those around the world. Technology also allows students to study practically by accessing virtual field trips, tours and international visits, which helps them grasp topics like geography. Such understanding makes it clear that these students will perform better than those exposed to traditional classroom settings. The virtual exchanges make sharing ideas and learning opportunities easier to further educational objectives. Although technology in education has grown over time, educators need help with how to use it in learning and teaching effectively (Jabbarov, 2020). Implementing the proper techniques is still very difficult since those involved in education need to know which ones to use when integrating technology. The scarcity of qualified educators who are adept at employing technology aids in the classroom is one such issue. A significant barrier is a need for a supportive policy environment that ensures teacher and student activity efficacy. But despite these difficulties, technology continues to be a significant force in the field of education. According to studies, by 2022, there will be more than 1.5 new digitalized employment possibilities globally, and more than 65% of children who started school in 2017 will have occupations that don't exist yet (Okoye et al., 2022). Similarly, there is now a scarcity of IT skills in over 90% of businesses and other organizations (Jabbarov, 2020). Comparatively, 75%

of those involved in education worry that the existing technological system won't give students the skills they need to hold onto employment.

The technology significantly contributes to speeding the transfer of knowledge from professors to pupils. A single curriculum of information sources may be shared by students worldwide thanks to technology. For instance, pupils can develop a streamlined knowledge base by accessing the same study resources online. Before the advent of technology, students relied heavily on textbooks authored by diverse writers, whose ability to reach students throughout the globe was limited by time and geographic constraints (Al-Hariri, and Al-Hattami, 2017). Inequalities in colonial education are now reduced because of technology, which allows students to acquire education from widely available sources. Because they use the same educational resources and curriculum, students are given equal opportunities to succeed.

The scientific use of technology in education may be explained using three notions or methods. The first is the Edwin Hutchins-created distributed cognition technique (Okoye et al., 2022). Hutchins refers to people, objects, and the environment as standard cognitive tools. According to the idea, the learning environment is adaptable and diversified, offering online and in-person courses and student interaction. The zone of proximal growth method, which portrays education as a supplier of skills outside of a learner's area of expertise and comfort, is the second notion used to describe the effects of technology on education (Al-Hariri, and Al-Hattami, 2017). It compresses tutoring, games, quizzes, and instructions. According to the strategy, technology allows teachers to organize their progressive delivery of instruction while complying with all specifications for skill mastery (Al-Hariri, and Al-Hattami, 2017). Before the development of educational technology, there were few options for students to study outside the classroom, such as through their local communities, churches, or schools. However, technology has completely altered the learning environment because students may now obtain knowledge through various channels (Al-Hariri, and Al-Hattami, 2017). Schools must evaluate how students might benefit from an education outside the school setting in light of the expanding dynamics and knowledge sources available. Technology offers an atmosphere for students of all backgrounds to get a high-quality education (Al-Hariri, and Al-Hattami, 2017). Interaction, a crucial component of the educational environment, is increased by technology. Students may express their opinions in interactive spaces and learn more from one another. Using technology helps students' minds become more efficient, which facilitates the effortless and convenient flow of knowledge (Okoye et al., 2022). Several things impact technology in education. The capacity of the instructors to use technology successfully to achieve teaching and learning objectives determines the usefulness of that technology (Al-Hariri, and Al-Hattami, 2017). Teachers must develop the skills necessary to use contemporary technologies to benefit their students effectively.

Therefore, one crucial component influencing how technology is used in education is the training of teachers (Al-Hariri, and Al-Hattami, 2017). Teachers need to be technologically literate and apotheosize technology in the classroom. Through improved studies, teachers may learn how to use emerging technology to improve their teaching. Notably, instructors' views regarding computer-based instruction may be harmful, impacting how they instruct students. When discussing how technology affects education, time is an important issue that must be

taken into account. Teachers must spend more time instructing using technological instructions. Therefore, it is essential to consider whether an institution has access to the internet, knowledge, support, and other resources necessary for success when employing technology in education before installing technologies there (Costley 2014). The need for high-quality training, dependable research and educational technology models to follow is therefore essential with the influx of devices and technology in education. As stated by Teach Thought (2022), essential questions can be created by teachers to verify before the use of tech is planned, organised or implemented in the classroom.

4. The positive side of using technology in international education

Technology has a significant influence on student growth and performance. Through the use of technology, students can better comprehend concepts, improving their overall level of engagement in class. According to studies, higher participation in class activities and interactions improves performance. For instance, studies comparing pupils who used technology and those who were in a conventional classroom environment revealed that the latter had higher performance levels (Costley 2014). More conceptual comprehension would result from considering the inclusion of technology in technical courses like engineering, physics, or chemistry. Students can better comprehend technical subjects when atoms and other components are animated and moved about straightforwardly utilizing technology (Costley 2014).

According to the study, effective learning processes exist across all educational institutions, with a good correlation between them. Through a qualitative and quantitative investigation, the study has added to the current literature by highlighting the significance of technology in education (Costley 2014). Examining how specific technologies affect academic performance at particular educational institutions should be the primary goal of future research. The effects of such particular technologies on specific groups of students, such as those with disabilities, those in kindergarten, or those at other educational levels, may include those of assistive technology, online classrooms, or virtual field excursions (Costley 2014).

Technology in educational facilities has contributed to globalization as well. Using the internet to communicate with individuals from varied backgrounds is an aspect of globalization. The tendency toward globalization is widespread in the corporate world. To counter this, educators and students increasingly embraced worldwide by developing regulations that guarantee interactive education from many places in response to the expanding use of technology (Dumford, and Miller, 2018). In the US, students can use video conferencing to obtain education from several locations. Similar trends are employed globally to promote relationships in the education industry (Costley 2014).

One frequent illustration is using internet resources to study other languages, which is challenging for international students. Students may now enrol in professional courses in other countries thanks to technology, allowing them to work there (Dumford, and Miller, 2018). MOOCS (Massive online open courses), have grown considerably through the use and accessibility of technology. Class central (2021) state that there has been an increase form 330,000 learners to over 220 million in the last 10 years., in 2021, 40 million users signed up

for a course. Technology, however, makes it possible for students from all nations to participate in online activities that ensure research sharing. Additionally, those exiled from politics can finish their academic requirements through distance learning and online courses. The variety of courses and access to hundreds of universities give everyone an opportunity to learn with the use of technology.

Reflective learning aids students in producing knowledge producing concrete results for their educational needs. As a result, technology helps pupils express their creativity more (Costley 2014). The application of technology has improved teaching and learning. Students can readily grasp classroom situations because of technological advancements like computers, projectors, cameras, and 3D representations (Dumford, and Miller, 2018). Additionally, while using visual aids in their lessons, teachers are more motivated, which helps pupils learn the material more efficiently. Learning becomes more enjoyable and enjoyable when information is visualized, resulting in more excellent content retention by students.

5. The negative side of using technology in international education

The growing instances of exam fraud and cheating have an equal impact on the educational system. Students may easily cheat on tests using technology tools like small cameras, advanced watches, and other devices, which undermines the effectiveness of the existing educational system since there is no oversight of motions and eye movements when taking examinations; online and distance learning can provide students with opportunities to cheat (Dumford, and Miller, 2018). To address this issue, the education sector must create new technologies to stop students from engaging in unethical behaviour. Students no longer use their judgment; instead, they spend their time on the internet. Students find it challenging to utilize their brains when given homework since they are more inclined to use online sources that allow them to copy and paste content. However, technological improvements may now identify plagiarized work, which might assist pupils in regaining their capacity for thought.

The growing instances of exam fraud and cheating have an equal impact on the educational system. Students may easily cheat on tests using technical tools like small cameras, high-tech watches, and other devices, which undermines the effectiveness of the existing educational system (Dumford, and Miller, 2018). Due to the lack of adequate monitoring of motions and eye movements when taking tests, remote learning and online learning can provide students with opportunities to cheat. To solve this issue, the education sector must create new technologies to stop students from engaging in unethical behaviour.

6. Conclusion

A crucial component of the current educational system is technology. The technology used in educational settings is known as educational technology (Costley 2014). Learners can develop more educational topics thanks to the instructional use of technology on television, computers, and other electronic devices. The association between technology and improved student achievement is beneficial. The level of comprehension of the material being taught in the classroom is very high in students with access to technological instructions and aids (Costley 2014). The use of technology improves communication between students and their teachers. Models such as SAMR and T-PACK give educators ways in which to develop themselves

professionally and to understand the use of technology when it is available and when it should be used. The models above help avoid the substitution of simply adding technology to a task. Technology should therefore be used to transform and redefine the way in which students learn at school. If a task or activity can be competed without the use of technology then it should, only when technology can add significant value to the learning in the classroom should it be used. A step forward for many schools could be to create guidelines and a list of essential questions for when technology could and should be used in the classroom. This would create consistency, quality and clarity for all educators in the community. Suggestions for planning questions could include the following which can be adapted for the age group and activity:

- Is the tech safe to use?
- Where does this fit in the SAMR model?
- Have I started with the purpose and learning rather than tech?
- Does it allow students to access this tech?
- Does it open up deeper lines of thought and inquiry?
- Does it develop problem-solving and critical thinking skills?
- Does it promote a global perspective and understanding?
- Does it allow personalised learning?
- Does it allow students to publish their work and get feedback – globally?
- Does it allow students to connect with others from around the world?

Additionally, technology gives students access to knowledge and abilities that may be useful to them in the future. With some of their extracurricular activities sacrificed, students with busy schedules can still attend class (Costley 2014). All these benefits notwithstanding, excessive use of technology may increase students' reliance on it. Technology also has ethical and legal ramifications, therefore institutions need to have clear rules for adhering to both federal and state laws and preserving ethics. The choice of if and when to use technology, the understanding of the impact of this both socially and morally should be considered and the continued investment in upskilling teachers to give them the tools to decide is imperative to keep up with the increase in technology now used in school and education.

References

3plearning (2020), the SAMR model explained with 15 examples, available from: https://www.3plearning.com/blog/connectingsamrmodel/

Alan November (2013), how teachers and teach can let students take control, available from: https://www.kqed.org/mindshift/27239/alan-november-how-teachers-and-tech-can-let-students-take-control

Al-Hariri, M.T. and Al-Hattami, A.A., 2017. Impact of students' use of technology on their learning achievements in physiology courses at the University of Dammam. Journal of Taibah University Medical Sciences, 12(1), pp.82-85.

CampusTechnology (2017), Survey 94% of students want to use their cell phone in class, available from: https://campustechnology.com/articles/2017/12/12/students-want-to-use-their-cell-phones-in-class.aspx

Child Encyclopaedia (2016)technology in early childhood education, available from: https://www.child-encyclopedia.com/sites/default/files/technology-in-early-childhood-education-info.pdf

Class Central (2021)By the numbers, MOOCS in 2021, available from: https://www.classcentral.com/report/mooc-stats-2021/

Costley, K.C., 2014. The Positive Effects of Technology on Teaching and Student Learning. Online submission.

Digital Education Awards (2022), BYOD in education, available from: https://www.digitaleducationawards.com/post/byod-in-education

Dumford, A.D. and Miller, A.L., 2018. Online learning in higher education: exploring advantages and disadvantages for engagement. Journal of Computing in Higher Education, 30(3), pp.452-465.

EdTechMagazine (2019), New Global Survey Offers Snapshot of Technology in the Classroom, available from: https://edtechmagazine.com/k12/article/2019/02/new-global-survey-offers-snapshot-technology-classroom-2019

EmergingedTech (2015), 8 examples of transforming lessons through SAMR cycle, available from: https://www.emergingedtech.com/2015/04/examples-of-transforming-lessons-through-samr/

Erikson Institute (2016),Technology and Young people survey https://www.erikson.edu/wp-content/uploads/2018/07/Erikson-Institute-Technology-and-Young-Children-Survey.pdf

Frontiersin (2020), Technology and Media Use in Preschool Classrooms: Prevalence, Purposes, and Contexts, available from: https://www.frontiersin.org/articles/10.3389/feduc.2020.600305/full#B40

Guardian, (2020), Most children own mobile phone by age of 7, available from: https://www.theguardian.com/society/2020/jan/30/most-children-own-mobile-phone-by-age-of-seven-study-finds

Papadakis, (2019). Parental involvement and attitudes towards young Greek children's mobile usage.

Harris, J.L., Al-Bataineh, M.T. and Al-Bataineh, A., 2020. One to One Technology and Its Effect on Student Academic Achievement and Motivation. Contemporary Educational Technology, 7, 368-381.

Jabbarov, U., 2020. THE ROLE OF TRAININGS IN THE FORMATION AND DEVELOPMENT OF FUTURE FOREIGN LANGUAGE TEACHERS.(1), pp.34-38.

Mishra and Koelher (2006) TPACK: Technological Pedagogical Content Knowledge Framework, available from: https://educationaltechnology.net/technological-pedagogical-content-knowledge-tpack-framework/

Okoye, K., Hussein, H., Arrona-Palacios, A., Quintero, H.N., Ortega, L.O.P., Sanchez, A.L., Ortiz, E.A., Escamilla, J. and Hosseini, S., 2022. Impact of digital technologies upon teaching and learning in higher education in Latin America: an outlook on the reach, barriers, and bottlenecks. Education and Information Technologies, pp.1-70.

Prensky (2018) Powerful uses of technology, available from: https://marcprensky.com/beyond-technology-in-the-classroom/

Raja, R. and Nagasubramani, P.C., 2018. Impact of modern technology in education. Journal of Applied and Advanced Research, 3(1), pp.33-35.

Pewresearch (2021) mobile phone ownership over time, available from: https://www.pewresearch.org/internet/fact-sheet/mobile/

Powerschool (2022), The TPACK framework explained (With classroom examples), available from: https://www.powerschool.com/blog/the-tpack-framework-explained-with-classroom-examples/

Puentdura (2006), SAMR Model available from: https://www.bookwidgets.com/blog/2022/03/what-is-the-samr-model-of-technology-integration

Szymkowiak, A., Melović, B., Dabić, M., Jeganathan, K. and Kundi, G.S., 2021. Information technology and Gen Z: The role of teachers, the internet, and technology in the education of young people. Technology in Society, 65, p.101565.

Teachthought (2022), 15 questions to ask about tech integration in your classroom, available from: https://www.teachthought.com/technology/using-technology-can/