

## **How can technology best serve teachers?**

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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### **Introduction**

The purpose of this study is to analyze the integration of technology in learning processes and examine the effective methods for empowering them to provide teaching experience for all learners. A variety of research studies have proved that many U.S teachers feel overworked due to excessive workload at their institutions (Yuen, 2008). One of the solutions for effective teaching practice can be implementing new digital tools in the classroom. Such experience can not only reduce teachers' workload but also create a new productive environment for both teachers and learners. Successful collaboration between teachers and new technologies can offer new opportunities to access course materials as well as study resources and tools to create quality learning experiences. (Office of Education Technology, n.d.) The paper will examine the best e-learning tools which can be adapted by instructors and institutions and discuss the challenges and barriers in the wide implementation of technology in teaching processes. I will use Social Construction of Technology (SCOT) to discuss the adoption of these technologies in education. Along with that, I will use the Technology acceptance model (TAM) framework to explore how digital learning tools are critical actors in affecting the school curriculum. Ultimately, we will analyze the viewpoint of relevant stakeholders.

### **Background**

Teachers invest a significant amount of time and effort into their students. They must organize lessons, grade exams, administer clubs or extracurriculars, and offer extra assistance to their students even when they are not in the classroom. It's no surprise, however, that many American teachers feel overworked and undervalued. "In a recent survey, American teachers

reported working for an average of 46 hours total each week, which was higher than or comparable to educators in all but two other countries” (Camera & Smart, 2019). According to another poll, 90% of American teachers are content with their professions, yet just 36% feel that the teaching profession is valued in American culture (Camera & Smart, 2019).

While the teachers’ work can be undervalued, they play a significant part in every student’s life. They shape the future of millions of students; teachers who recognize the importance of their daily actions and behaviors in influencing their students' futures are those that succeed. Great instructors have a long-term influence on students' well-being, benefiting not just their academic success but also other long-term social and job prospects. Therefore, it is essential to have experienced and well-educated teachers as they serve as a foundation for students’ knowledge (Mupinga & Maughan, 2008).

### ***COVID-19 Pandemic impact on the rapid growth of technology usage in the classroom***

COVID-19 pandemic has put pressure on school systems to maintain learning continuity, putting additional responsibilities on instructors. More than ever, education systems demand effective teachers who facilitate and encourage learning rather than providing content; who deliver lessons using a combination of in-person and digital methods; who foster creativity, interaction, and collaboration; and who impart a love of learning, perseverance, and self-control. Because of the unexpected closure of schools, education policymakers, school principals, and instructors had to develop alternatives to face-to-face interaction to ensure that children's right to education was protected. Instructors were compelled to swiftly embrace new online teaching techniques and learn how to use technology in the classroom. As a result, instructors and students have adopted online teaching and learning in unprecedented numbers. Yet initially it was challenging for teachers to adjust to a digital educational environment, such as Zoom, but it

has become a handful now as more and more classes are being held online, increasing the demand for distant learning. In April 2020, during the peak of the pandemic, Zoom announced the milestone of 300 million meeting participants daily. Today, the software records more than 3.3 trillion annual meeting minutes (Dean, 2022). However, rather than serving as a replacement for traditional classroom instruction, they are used in conjunction with it. The electronic educational resources have aided in the introduction of a number of new concepts into learning. The widespread use of Computer Assisted Language Learning methods, activities, and resources has helped many teachers throughout the world to improve their teaching and optimize learning possibilities for their students. Fortunately, an increasing number of high schools and homes have computers and Internet connectivity, making technology-assisted learning possible. More than three-quarters of instructors stated more than 75 percent of their students had appropriate internet connectivity at home for continuous engagement in remote learning in a recent EdWeek Research Center poll (Lieberman & Moore, 2021).

### **STS framework**

The framework used for this analysis will be the social construction of technology (SCOT). SCOT is a theory that claims that the evolution of technology is due to the interpretation and adoption of new technologies by various social groupings. Interpretive flexibility, relevant social communities, and stabilization are the three main ideas of SCOT. The concept of interpretive flexibility states that different stakeholders may have diverse perspectives on the problem and its solution. In certain instances, the same technology can solve the concerns of many distinct stakeholders. Relevant social groups are groups of stakeholders with similar technological goals or meanings. Stabilization is the predominant one of all social groups in the midst of competing groups.

Another relevant framework will be the technology acceptance model (TAM). TAM is the theoretical framework which claims acceptance of computer technologies and usefulness of tools among consumers. It determines the teachers' confidence in using technology in the classroom.

There are many stakeholders involved in the problem including teachers, students, educational institutions, nonprofit professional associations, and advocacies. The framework will focus on teachers' attitude in adoption of digital tools in their coursework, how educational institutions enhance implementing technology, and identify each of the stakeholders' interpretation of the problem- how technologies can best serve the educational field.

### **Teachers' and students' perspectives**

#### *Teachers' Attitude*

Many factors affect the effective usage of computer technology in the field of education. The successful use of computers in classrooms heavily depends on the teachers' attitudes towards computer usage (Yuen & Ma, 2008, 230). "Attitudes and beliefs about both educational technology and pedagogy, in general, will ultimately influence how teachers implement technology" (Johnson et al., 2016, 24). To determine teacher attitudes about computer use, a variety of studies were conducted. According to the study results, those who had negative computer attitudes were associated with lower computer skills, making them less willing to embrace and adapt than those who have a good attitude toward technology (Al-Zaidiyeen et al., 2010, 213). Based on the collected data on 776 workers in the educational sector, it is reasonable to assert that a good attitude toward emerging digital tools can result in quicker adaptiveness and higher desire in adjusting to the tech environment. According to a recent survey, educators are overwhelmingly supportive of the growing role of technology in schools. Teachers have already

shown support for technology as it relates to the learning experience in this study, but now they also express optimism about where technology might go as a growing entity in the classroom (Nagel, 2018). “The results indicate that 75% of survey participants believe technology has had a positive impact on education, with 36.63% of participants indicating that technology has had a mostly positive impact on education and 38.37% of participants indicating that technology has had an extremely positive impact on education” (Nagel, 2018). It was concluded that students’ interest in e-learning was not noticeably altered, but difficulty of working with and studying technology was significantly reduced.

#### *Beneficial outcomes of digital learning tools*

It is important to identify whether the tools' use results in any changes in the way things are done. According to (Tsayang, et al., 2020,27), one of the most important questions to ask when contemplating technology use in education, is whether the technology is providing students with new and diverse learning experiences, or if it is simply assisting them in doing new things in old ways

Computers, tablets, projectors, flash drives, mobile phones, digital cameras, and video recorders entered the classroom environment at the same time, affecting many facets of education from student projects to lecture presentations. The Smart Board, which combines a computer, projector, and touch screen electronic board, is another breakthrough from the last two decades (Akar, 2020, 267). By implementing this smart technology, it is feasible to build a blended and customized learning environment which can benefit students' mental and physical growth. Furthermore, Smart Board provides teachers with the most up-to-date smart and virtual teaching technique tools, allowing them to reinforce the theoretical and practical academic foundation that promotes an interactive, engaging, and entertaining learning environment along

with vivid demonstration of academic progress in the classroom. It is evident by the fact that in the quantitative phase of the study, 47 experimental studies looked into the impact of using a smart board on academic performance. Based on this data, it can be concluded that using smart boards in classes (as opposed to traditional technologies) improves academic success. (Akar, 2020, 267).

Not only Smart Board but also e-learning technologies can benefit both teachers and students. One of the examples is Google Classroom which acts as a hub for engaging with students, sending feedback, and providing assignments. Timesaving and organizing tools that are straightforward to use and extremely basic are some of Google Classroom's primary assets. Along with that, Google Classroom has features that make the learning not only effective but also entertaining. First, Google Classroom increases the interaction between educator and student. Educational applications that relate to Google Classroom allow teachers additional flexibility in making classes more dynamic and interactive. Educators can construct assignments that incorporate an engaging online game, a fun YouTube clip, or a visually appealing slideshow with useful information and pictures. Google Classroom makes learning enjoyable and engaging for today's tech-savvy students. Secondly, Google Classroom allows teaching to be more centered and arranged in a specific way. Educators may examine classwork at any time and from any location, making instruction more focused and structured. You may view all your students' works and grades from anywhere using a laptop, tablet, or phone. Google Classroom also helps you keep organized by putting all your assignments, grades, and announcements in one place. Everything is easily accessible; simply select the appropriate tab to locate what you're searching for. Because everything is kept in your Classroom Drive folder, it's much easier to find finished assignments or a specific student's work.

### *Automated Assessment tools*

Another successful implementation of technologies in the learning process can be automated assessment tools (AATs). AATs are software systems used in e-learning environments to give automatic feedback of computer programs implemented by students. (Cipriano et al., 2018). The Web-Cat tool has become an indispensable part of the course process for most introductory programming classes. The importance of such a tool is that students receive immediate feedback and allows instructors to shift responsibilities from grading (Edwards & Pérez-Quiñones, 2008).

This type of grading is nonsynchronous, granting instructors to increase the enrollment size of the class and not worry about the time that would be spent on grading a large number of assignments. Students can test and run their code assignments and receive immediate feedback from the program without the need for a teacher or instructor. The faculty workload is reduced and considered a time-saver for both students and professors. It also prevents grading bias and advances grading consistency. (Pettit, et. al., 2017).

Learning tools that have been widely used in today's classroom have beneficial outcomes for both major stakeholders: educators and students. While teachers may benefit from a digital learning environment that incorporates active involvement, facilitation of assignment grading and feedback systems, learners can find e-learning platforms as a powerful tool to boost academic performance and make the learning fun. Digital e-learning platforms and use of advanced technology during the classroom can be considered as essential tools in any method of teaching.



Students' learning gains from AATs are evident and quantitative. However, according to studies examining student perceptions of these tools, there is "insufficient evidence to show that students found that AATs have helped them," with opinions ranging from gratitude for the constant and quick feedback to complaints that the AATs were too "picky" and missed simple errors that humans would easily recognize (Pettit, et. al., 2017). The inclusion of the following section adds to this pattern of divergence between what students believe is beneficial and what is useful.

#### *Barriers to implement smart technologies in the classroom*

Although computers have become commonplace in most educational settings, there are still numerous impediments to technology adoption. "Achieving technology integration in education is, in addition to being dynamic, a complex, slow and long-term process, regardless of the level of technology integration desired" (Ardıç, 2021, 82). One issue with the usage of technology is teachers' capacity to obtain the types of resources required to effectively utilize these technologies. The most common detractors of successful technology use in the classroom are external or first-level obstacles. Lack of access to computers, software, planning time, and administrative support are among these factors (Canough, 2013). Internal barriers make up the second level. Teachers' unfavorable attitudes, low self-confidence, and negative perceptions regarding the use of technology, present learning-teaching and classroom routines, innovations, and adjustments are examples of these hurdles (Ardıç, 2021, 83). The deployment of educational technology is not possible if a teacher's school lacks suitable computers and a fast internet connection. Teachers will not be able to fully utilize new technology unless they receive good professional development on them (Johnson et al., 2016, 17).

## **Educational institutions' role in the digital tools**

Educational institutions play an important role in promoting a qualitative education, hence, any contributions that they make are valuable. Institutions are in charge of pre-service and in-service educator professional development. Teachers will not be able to fully utilize new technology unless they receive good professional development on them (Johnson et al., 2016, 17). Therefore, they should ensure that all educators are capable of selecting, assessing, and employing relevant technology and resources to create experiences that encourage student engagement and learning. One strategy to assure technology integration is to provide teachers and school districts with the necessary resources, such as technology and software, through government financing (Canough, 2013). Even if a technology project has been a success, new policies must be implemented, more money must be spent on upgrading software and updating hardware, more appropriate help must be provided to both teachers and students, and more investment must be made in maintaining and improving sufficient technical support (Lim et al., 2013, 63). Without embedding technology-based learning into the programs themselves, the strategy's goal will be impossible to attain (*Teaching - Office of Educational Technology*, n.d.).

## **Conclusion**

Individual students' learning may certainly be enhanced by technology, but it can also foster collaboration among students and between students and instructors. Students may better acquire cooperation skills in the classroom and use other students as resources to learn by sharing their work and ideas through interactive websites, learning forums, and shared documents. Technology also makes it simpler for instructors to collaborate with their students through various hands-on technology and e-learning platforms. While implementation of those emerging technologies can result in a win-win situation for both educators and learners, certain

barriers need to be considered, including internal and external ones, to address the issue in a public eye. Educational institutions play a key role in resolving it and they should encourage integration of technology into education to provide both teachers and students with necessary technical support.

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