

# Analyzing the Integration of Technology in the Education System

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## **Abstract**

*As the world is in a constant state of change, schools need to constantly adjust their classroom settings to be consistent with their students' daily lives. With the advent of the internet in the past few decades, the introduction of advanced technology in the education system has become a significant issue and talking point. However, a relatively small amount of research has been done on the effects of this shift, which is mainly due to the short amount of time it has had to influence the education system and the different levels of integration between schools. Though a number of studies have concluded that the use of online resources has visibly improved overall student performance, there is a much larger issue in the way technology is being used. Schools are utilizing technology as a support structure rather than completely adding it into the curriculum. The belief that technology can distract students from learning, while not unfounded, has been damaging in this regard, as overly strict policies have prevented students from accessing tools that have the potential to aid them in their education. In order to solve this issue, a consistent, schoolwide plan to implement technology that receives support from teachers and administrators alike needs to be created. This plan can take many forms, but using more experienced teachers as role models, ensuring that each student can access the same resources, and taking advantage of the knowledge gained during remote learning are all extremely helpful in improving technology use and bringing it up to the standard set by other sectors. All in all, the main goal of schools is to prepare students for their future careers, and in a world of technology it becomes increasingly important to keep up with modern trends.*

**Keywords:** Education, technology, policies, internet, teachers, classrooms, remote learning.

**Subject:** Education Technology

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## **I. Introduction**

As the usage of increasingly advanced technology becomes more prevalent, it has been adopted by nearly every sector and industry across the world. This is apparent in the education system, where the past twenty years have seen a hundredfold increase in resources spent to integrate technology into schools (Lim et al., 2013). However, this raises the question of whether this level of investment is worth it. Schools are demanded to continuously demonstrate increases in their students' academic achievement to avoid severe repercussions (Buckenmeyer & Freitas, 2006). However, have these additions resulted in visible improvement, or are they distractions that are more trouble than they are worth? The answer is complicated.

A key issue in determining the impact of introducing technology in schools is that the implementation does not occur evenly, as each school has differing views and policies on this subject. Some aim to heavily restrict its use mainly based on the notion that devices can become a distraction within a classroom environment, while others are laxer (Mupinga, 2017). Most schools have been unable to incorporate technology because of the former and a variety of other reasons including high costs and low support, creating a massive problem for students and teachers alike (Means et al., 1995). This makes it difficult to create a generalization, especially with the relatively limited amount of available data (Roschelle et al., 2000). While evidence suggests that the use of technology has been connected to academic improvement, a majority of schools are not making full use of it. Ultimately, schools must resolve this problem to more tangibly experience possible benefits from using technology.

## **How Technology Can Improve Learning**

As stated earlier, little research has been conducted on how technology impacts a school setting. However, much of the available data, including statistics from studies done by groups such as the ACOT (Apple Classrooms of Tomorrow), purports that it has a positive effect on students (Buckenmeyer & Freitas, 2006).

This is especially clear in the fields of science and mathematics, where notable improvements have been observed (Roschelle et al., 2000). These achievements can be attributed to several key aspects that have become prominent in recent years. The internet has given teachers and students access to numerous resources that allow for vast improvements both in communication and in finding information.

Furthermore, the introduction of apps from companies such as Google has provided tools to make learning easier and more efficient than ever (Mupinga, 2017). For instance, online graphing calculators allow students to visualize variables in ways that are difficult to represent on paper, and programs like Google Sheets and Microsoft Excel make it much easier to store and edit large amounts of data (Means et al., 1995). When every student in the classroom has access to these tools, through phones or even laptops, learning becomes much simpler and concepts can be more easily taught to students while a greater variety of new activities becomes readily available, which have even allowed teachers with issues in developing classroom practices to drastically improve their strategies (Windschitl & Sahl, 2002). There are now countless new apps and programs available on the internet, and with enough searching a teacher can always find one that perfectly suits their needs.

### **Issues in Integrating Technology**

While data supports a positive correlation between the use of technology and academic achievement, research has also revealed a big problem: the gap between schools and other sectors. Many industries are far ahead of the educational system in terms of their use of technology, creating a massive problem when the classroom environment significantly lags behind students' daily lives, resulting in a disassociation from education and an inability to learn properly (Lim et al., 2013). In general, technology is used mainly to reinforce parts of a preexisting core system or only used for special education students and enrichment activities, which is very ineffective (Means et al., 1995). In fact, some schools prefer to keep technology away from classrooms by relegating its use to homework or other out of school activities (Vegas, 2022). Because teachers often develop their use of technology in classrooms based on their personal beliefs (Windschitl & Sahl, 2002), the idea that technology can be a distraction has resulted in a limited integration that does not fully exploit the potential these devices could offer.

### **The Impact of Remote Learning**

With the Covid-19 pandemic forcing billions under lockdown in early 2020, schools were forced to shift into remote learning to continue educating their students through that time, putting pressure on teachers to adjust to the new online setting. While educators struggled to learn how to use technology to host online meetings and send assignments to and from students without any physical interaction, it has allowed for progress to be made in regard to the integration of technology and irrevocably changed the classroom ("What Has the Pandemic Taught School Leaders", 2022). Unfortunately, as schools have reopened across the world, there has been a push for education systems to go back to how they were before the pandemic (Vegas, 2022). This is a significant missed opportunity for reform within schools that had the potential to begin resolving current issues in the integration of technology. However, the increased digital literacy many teachers were able to gain from the adjustment to remote learning can still be put to good use.

### **Mobile Phone Policies**

The drastic difference in views towards technology can be exemplified by trends in mobile phone policies across high schools. With the continued distribution of increasingly portable technology, around 95 percent of students bring phones to school daily (Solomon, 2019), necessitating the creation of phone policies. In this regard, some schools embrace mobile technology in the classroom, while others have policies that are vague, silent, or even completely prohibit phones, with most falling under the latter category (Mupinga, 2017). According to their purpose, these bans should be removing potential distractions to students. However, a survey directed toward teachers and administrators tells a different story. While the no cell phone policies were created by school administrators, teachers have cited a lack of agreement with them on this approach, with many viewing it as outdated, resulting in a lot of confusion and inconsistencies (Mupinga, 2017).

But do the administrators' views hold any merit? It has been argued that this can be attributed to how they fail to fully understand technology (Buckenmeyer & Freitas, 2006), leading to a flawed outlook and approach, but the truth is more complicated than that. While phones do serve as a valuable resource to students, they indeed have the potential to divert their attention. A study allowing one of two groups of students to use phones during college lectures has demonstrated that while both groups had comparable comprehension of the lectures, even students in close proximity to phone users scored significantly lower in later exams (Glass & Kang, 2018), which does validate a restriction on mobile technology. However, a complete ban is not very effective due to the fact that it is difficult to enforce by teachers, especially as some students will continue to use their phones regardless (Mupinga, 2017). It will only end up preventing students from accessing any of the apps

that could benefit their education while not solving the main issue at hand. As this idea becomes more widely recognized, the number of schools enforcing a complete ban on cell phones has dropped over 30 percent since 2010 and is expected to only get lower with time (Solomon, 2019).

### **Recommended Solutions to this Issue**

Due to the lack of proper integration of technology in most schools, it is important for them to improve in this regard. While the distractions created by technology clearly impact students' academic performance, the ineffectiveness of policies that completely restrict its use is also apparent. To create a viable and enforceable policy that still gives room for students to use online resources, schools must seek input not only from administrators, but also from teachers, students, and parents (Mupinga, 2017). However, this is not enough to address many schools' inability to fully incorporate technology into their students' education.

For technology to be used to its fullest extent, reforms of classroom environments and curricula are necessary. Research has indicated that technology works as a much more effective learning tool when implemented as a part of these adjustments (Roschelle et al., 2000). However, this is not easy, as a lack of support and unwillingness to make these changes can make such a goal impossible to reach. A plan to accomplish this needs to be flexible and adaptable while reflecting a school's values, and requires commitment from both teachers and administrators (Lim et al., 2013). As schools have generally become more tolerant of technology over time (Solomon, 2019), the possibility of implementing such a plan is now more likely.

While it is not possible to devise a plan that uniformly works across every school, some broad strategies can help with this. For example, schools usually have a few teachers who initially embrace technology, and it is possible to use them as a "core group" with help from administration and expand from there. Another approach involves giving students computers for personal use for easier access to online resources, which allows for more opportunities to introduce technology and makes them worth the heavy costs. While these changes are extremely helpful, it is important to give teachers time to adapt and learn to use technology first instead of rushing to change (Means et al., 1995). Fortunately, the adjustments teachers were forced to make in the face of the 2020 lockdown has given them experience in this regard, which makes it easier to transition into a classroom setting that incorporates technology as a fundamental part of its curriculum.

## **II. Conclusion**

The increasing use of technology has pushed schools to adapt in order to continue preparing students for this new world. The use of technology has proven beneficial in a school setting, but an overwhelming concern about its potential to distract students has prevented it from being fully incorporated in many schools. However, strict policies against technology are ineffective and have been on the decline, opening up more opportunities for schools to exploit the benefits that technology offers. To do so, schools need to support plans to integrate technology as a major learning tool by pushing for more support and increasing access to devices. This is likely to improve student academic performance and will make sure that the next generation will be ready to face the challenges that our future has to offer.

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