EDUC 6315 Research Paper Submission:

Teaching with Technology: Then, Now, and Beyond

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Attempting to address, analyze, and discuss the role of technology in American education is, at the risk of making a gross understatement, a daunting task. Hundreds of educational and pedagogical scholars, dozens of periodicals, innumerable books, and countless articles are already dedicated to the topic. Trying to do the entirety of the subject matter justice in this paper would fall far short of what these works and their respective authors have already accomplished. Instead, this work will serve as a brief survey of topic, with specific emphasis placed upon the history, evolution, and effects of technology in education. Before proceeding any further, however, it is necessary to establish two important criteria by answering a pair of critical questions.

Background and Scope

First, exactly what type of institution are scholars referring to when they use the term *American education*? To the non-specialist, the answer ostensibly seems an obvious one. The most common response, and one that most Americans undoubtedly think of, is public education. That is to say, the current network of public, private, and charter schools across the United States that serve the primary, secondary, post-secondary educational and vocational needs of the American public. Nonetheless, education professors John D. Pullman and James J. Van Patten point out that the roots of American education penetrate deeper and spread farther across U.S. history than simply the founding of the nation (Pullman & Van Patten, 2013, pp. 4-13). While the present paper is an infinitely smaller work, in both breadth and depth, than Pullman and Van Patten's 407-page textbook, it is worth at least trying to encapsulate what the pair says about the history and evolution of American education. If nothing else, doing so will provide a starting point from which to launch an appropriate analysis.

American education did not somehow simply wink into existence after England's North American colonies declared their independence from the Crown in 1776. Instead, the system was inspired by and founded upon an amalgamation of Western influences, extending as far back as the fifth and fourth centuries BC (Pullman & Van Patten, 2013, p. 3). Specifically, one can trace its lineage back to ancient and classical Greco-Roman scholars and statesmen, such as the iconic Socrates, Aristotle, and Cicero (Pullman & Van Patten, 2013, pp. 3-4).

We could continue to cherry pick various figures from Western history who made cumulative contributions to American education but, for brevity's sake, it is far simpler to mention several influential groups and movements of the past. Among them are the educated ecclesiastics of the so called "Dark Ages," the monumental thinkers of the Renaissance, and the spiritual pioneers of the Reformation and Counterreformation. The following centuries brought with them the visionaries of the Enlightenment, the philosophes who came to prominence during the Age of Reason, the republican revolutionaries who wrought great socioeconomic change across Europe and the Americas, the moguls of the Industrial Revolution, the Romantics who decried them, and a civil war that scarred the country. The twentieth-century saw two world wars that reshaped the global balance of power, the rise of progressive activism, and many brave civil rights leaders who fought for a more egalitarian America. More recently, the world watched in awe as a new wave of technological innovators brought forth a bold age of digital communications and information. Indeed, as Pullman and Patten surmise, "No educational system is created in a vacuum. Schools exist now to serve the needs of contemporary American society, but like society itself these needs are changing rapidly" (2013, p. 3).

Like technology, or perhaps because of it, American society is undeniably moving at breakneck speed. At this point, however, we must pause to address the second of the two major

questions referenced at the outset of this analysis. Specifically, what is technology? In of itself, *technology* is a broad term—one that could potentially lead an unwary author and his or her unassuming audience down a figurative rabbit hole of no return. For example, education professional and author Dr. David Thornburg observes in his book, *From the Campfire to the Holodeck,* that scholars can trace the fundamental roots of technology in education back to the earliest mists of recorded history (Thornburg, 2014, p. 11). Again, the boundaries of the present assignment prohibit such an exhaustive study. Alternatively, the present inquiry shall be confined to the role of technology in education over the last 30 years—a span of time characterized by the emergence and exponential growth of the Internet, which spurred unprecedented socioeconomic change and educational reform in the United States (Pullman & Van Patten, 2013, p. 207).

Change and Reform

With the issues of change and reform brought into the picture, let us next address this pair of very essential talking points. The duo earns their critical status because they interconnect with both American education and technology on a fundamental and recurring basis. If a research student were to draw a Venn diagram, with one circle labeled “American Education” and the other “Technology,” he or she would inevitably label the intersecting area between these two spheres “Change and Reform.” Within the dual contexts of American education and technology, both change and reform share an interdependent and pedantic relationship—much to the chagrin or delight of different stakeholders in American education (Pullman & Van Patten, 2013, pp. 11-12). One only need look back to the introduction of the Internet in public schools to truly appreciate the exceedingly back-and-forth nature of technological change and reform in education.

In 1984, during the height of the Cold War, Americans used tens of thousands of computers for many industrial and commercial applications but nearly none of these machines were available to public school students (Murdock, 2014). Just three years later, however, nearly one-quarter of public schools (K-8) made use of computers (Murdock, 2014). By the turn of the decade, schools were using multimedia platforms, such as advanced PCs running videodiscs, which allowed the users to learn with simulations and educational databases, among other important programs (Murdock, 2014). The Internet, meanwhile, had quietly been gaining momentum in the public and private sectors but did not catch on in mainstream American education until 1994 (Murdock, 2014).

The introduction of the Internet and the World Wide Web in public schools marked a true revolution in American education. Although still a nascent technology in the mid-to-late-1990s, it allowed teachers, students, administrators, and parents to communicate, teach, and learn in unprecedented ways. Near the close of the decade, nearly every public school classroom prominently displayed at least one computer with online access (Murdock, 2014). Moreover, computers increasingly became even more sophisticated, offering students features such as "digital video, virtual reality, and 3-D systems" capable of capturing the imagination (Murdock, 2014).

Despite all their self-contained applications, the most attractive aspect of computers—especially through the early 2000s—was their capacity for accessing and downloading online content (Murdock, 2014). Technology and social media companies that are today household names, such as Google, Facebook, and Yahoo, initially took shape during this period and brought with them sweeping winds of change. Unparalleled access to virtually every corner of the world provided teachers and students a global stage from which to administer and pursue their studies.

Unfortunately, all these advances did not come without a price. Online users soon became familiar with the dangers of computer viruses, malware, spam, online scams, and internet predators (Murdock, 2014). One of the earliest viruses to wreak havoc in the American school system was the nefarious Love Letter/I LOVE YOU, which made its debut at the turn of the millennium. Disguised as a benign email, Love Letter/I LOVE YOU actually erased all the user's image files upon being opened by the unsuspecting recipient; it was a malicious program that frustrated and angered millions of people across the world, including many teachers and students (Weinberger, 2012).

In response to these attacks and other more routine problems, such as students accidently or intentionally accessing inappropriate content, Americans implored the federal government to step in and act. An initial piece of legislation passed to combat these issues was the Children's Internet Protection Act (CIPA), passed by Congress on December 15, 2000 (American Library Association, 2019). Still enforced today, CIPA mandates that all public school officials wishing to receive federal discounts and dollars for e-programs must implement and enforce internet safety policies within their districts (ALA, 2019). This de facto sort of enforcement ensures that students are not accessing inappropriate material or accidently divulging personal information while online.

Incorporating technology into teaching has also been the source of many legal disputes as well. One of the most well-known cases is the federal class action lawsuit, *Robbins v. Lower Merion School District* (2010), which was brought to court on behalf of two Philadelphia students who discovered that their schools were secretly taking pictures of them, at home, by remotely accessing the cameras embedded in their school-issued laptops (Martin, 2010). Coined the "WebcamGate Scandal," this "eight-month saga" concluded with the Lower Merion School

District agreeing to "pay $610,000 to settle lawsuits over its tracking of student laptop computers" (Martin, 2010).

Technology in Education Today

With all the negative consequences associated with technology in education, it might be tempting to conclude that computers in the classroom are more trouble than what they are worth. In reality, however, the many positive benefits associated with granting students internet access at school far outweigh the negative. According to a 2006 National Center for Education Statistics report, during the last decade, nearly 90 percent of schools with internet access reported using "high quality digital content" in their instruction, including materials such as publications and manipulatives bought online, digital library resources, online museum exhibits, Web documents, and games (Wells & Lewis, p. 8). Other Web-based services included online continuing education courses for teachers and distance education classes for students (Wells & Lewis, 2006, p. 8).

Debates surrounding the role of technology in education today have assumed an even greater meta-narrative than what was argued in the past. Rather than merely navigating the technical and legal implications of computers in the classroom, contemporary pedagogical scholars are looking to redefine the overall role of technology in society. One of the first groundbreaking works that addressed this issue was the 1992 article "Integrating Science-Technology-Society Into Social Studies Education" (Marker). Author Dr. Gerald W. Marker insists that "science, technology, and society" topics take a more inclusive role in modern social studies curriculums (1992, p. 21). While this might seem a somewhat tacit observation today, the emerging social and cultural impacts of digital technology went relatively unnoticed during the early 1990s (Marker, 1992, p. 25). Evolving sentiments can be seen in certain holistic

movements, such as the recent “STEM to STEAM Initiative,” that aims to fully integrate national science, technology, education, and math educational agendas with the arts (Jolly, 2014). STEAM proponents claim that technology has become so completely ingrained within society that even the arts, both performance and liberal, cannot be taught without it (Jolly, 2014). Others also cite the need for cultivating and applying artistic creativity in occupations traditionally considered part of the “hard” sciences, such as engineering and robotics (Jolly, 2014).

Conclusion

The single constant within American education that can be predicted with relative certainty is change. In the classroom, this equates to shifting curriculums, differentiating instruction, and the adaptation of new pedagogical concepts to accommodate emerging twenty-first-century strategies. Outside of school, various stakeholders will continue to debate the merits and dangers of incorporating technology into exceedingly more elaborate and demanding curriculums. Every new innovation will ostensibly be used to prepare students for the increasing demands of a hyperconnected world. Such moves, however, must be weighed against the potential harm they might visit upon our students. Ultimately, only time will tell.

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