Learning from a Laptop: The Ethics of Technology in Education

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No other factor has inspired more progress – and instigated more heated debate – in modern education than technology in the classroom. In college lecture halls, discreet ceiling-mounted projectors flash lecture slides to students jotting notes on their laptops. At elementary school desks, children master their math lessons in app-based games on tablet devices. What was once an extravagance has become a part of everyday life for students and teachers alike, but this constant connection has fueled intense debate over the ethics of how students use technology to learn. Issues of affordability and distraction, as well as questions of security and peer-to-peer interaction all play a role in the use of technology in education. This paper examines these and other issues through a contemporary lens and explores their societal and global impacts.

Any technology comes at a cost, and not a purely financial one. Instructors in technologically-progressive schools are often inundated with technology yet unable to use it properly due to issues of complexity or unfamiliarity. They may find themselves behind the learning curve and have to spend large amounts of time acquainting themselves with new software and hardware [11]. One overwhelmed teacher in a rural school district expressed how "'At this point, getting more technology would be a disaster…'" [11]. The same article pointed out that technology "requires innovative faculty", but that schools with otherwise lacking funds cannot provide proper equipment or training to those faculty [11]. Matt Richtel's commentary on the direction many schools are taking with educational technology illustrates how the bulk of the "cost" lies in the time and resource investments of educators and school administrators:

> Critics counter that, absent clear proof, schools are being motivated by a blind faith in technology and an overemphasis on digital skills — like using PowerPoint and multimedia tools — at the expense of math, reading and writing fundamentals. They say

> the technology advocates have it backward when they press to upgrade first and ask questions later [8].

In short, learning advocates are concerned that rather than making learning activities easier and more effective, technology can create a unique kind of chaos for those forced to learn it quickly – namely, the teachers and students who seek to benefit from it.

Cost with regard to the resources of the school is equally valid. Aside from allocating new or using existing physical space required for large-scale technological resources such as computer labs, schools must also decide how to introduce new technology without overworking the school's existing infrastructure. Kenneth Collura, who started the first program in the nation to provide every high school senior with a tablet computer for both classroom and home use [5], dealt with such issues firsthand. He raised the important point that schools must consider a technology program's viability – whether the school can maintain the program in the long-term [1]. Equipping an entire school or university to provide adequate internet connections for hundreds (or thousands) of devices like laptops and tablets and maintaining the web traffic afterwards is no small feat, and requires careful planning and consideration by school administrators as well as cooperation and patience from faculty.

Educators, taxpayers, students, and many others remain engaged in a tug-of-war over an equally pressing contemporary issue: availability of technology. Learning advocates claim engagement is key to harnessing students' creative and mental abilities, and many of these advocates argue that technology can significantly improve levels of engagement. Quest to Learn is probably the best-known case study for this argument. The school, started in New York City in 2009, encompasses the concept of "gamifying" education. Its curriculum is based entirely on gameplay and is interwoven with creative tools podcasting and game design programs. The school's general approach is to meet students at their individual ability levels through technology

while making the overall learning experience "more participatory, more immersive…[and] more fun" [2].

But critics of the "engagement" argument raise a valid question: Can too much technology adversely impact learning? One blogger for the Chronicle of Higher Education claims that digital devices in the classroom create "competing spaces of attention" – for example, between an instructor at the front of the room and a program on a laptop screen [3]. Reporter Nicole Glass highlighted American University professor Richard Flanagan's concerns on how this competition can lead to a paradox where a student is physically present but mentally absent: "Students rapidly typing up notes turn into "court reporters" that create, perhaps, an accurate account of the class without ever gaining a proper understanding of the material, said Flanagan" [4]. Yet another professor at Stanford argued that maintaining long-term engagement between a student and the learning material can be difficult. He echoes a concern many parents may also hold – that real life is not always like a game, and that students who are "inundated with 24/7 media [and] expect it", as teacher Sharon Smith claims [8], can struggle to learn in environments of varied or limited technical resources.

From a broad societal standpoint, the focus on the cost of technology is primarily financial. Taxpayers hold a major stake in the push for educational technology. Million-dollar budget proposals and state-mandated efforts to increase technology's educational presence ultimately fall on taxpayers' shoulders [8], bringing them to question whether their money is being spent effectively, and whether it needs to be spent at all. With technology programs still in their infancy stages for many schools, gauging their effect on test scores and overall learning quality is difficult, and deciphering what little data does exist is confusing. Many studies show

no change in test scores [7], and experts have questioned whether improved scores result from technology or superior teaching [8].

On a global level, the cost of educational technology raises an entirely new set of ethical concerns when outside beneficiaries contribute. Alternative funding often stems from "big-name", multinational companies: for example, in its overview of a new public school in New York City, Popular Science Magazine reported over $1 million in funding from the school came from companies like Intel and the Bill and Melinda Gates foundation alone [6]. But such large-scale contributions have stirred concern over whether sources of private funding have students' academic interests as their top priority [8]. This concern, combined with the still-unclear picture of technology's effectiveness, has caused significant consternation for those directly involved in funding students' educational resources.

On a societal level, disagreement over technology's level of availability in education can cause major discord inside and outside the classroom. Every school differs in the type, quality, and scope of technology it can provide its students, and these differences cause significant intra- and inter-school conflicts. For example, schools in rural areas can create conflict between a student's home and school learning environments simply by providing resources during the day that are unavailable after classes dismiss, causing students to cut family time short and remain at school to complete assignments. Meanwhile, schools such as Quest to Learn are inundated with technology, often to levels that overwhelm both instructors and students. Resulting from all of these discrepancies in availability of technology are "pockets of innovation", or regions of extremely tech-savvy students among others in which students lack even basic technological skillsets, and thus lead to an intra-generational division of ability [11].

Globally, technology's ability to students directly affects life-preparedness. Both traditionalists and technology evangelists can agree that the main goal of using technology in education should be to prepare students to succeed in the increasingly technology-oriented network of people that is today's world. The degree to which technology furthers that goal, however, remains disputed. A superintendent in one rural school advocating stated, "For us to be competitive globally … we need to give [students] the resources to be successful." Instructors in similar school districts praised technologies many take for granted, such as rapid internet connections, for providing access to a "library of [otherwise unavailable] resources" [11]. Examples include online interactive lessons and software simulations for modeling dissections [11]. But as with any virtualized model, the digital model of learning leads many to question whether a simulation can replace real-life experiences. In a way, schools such as Quest to Learn can be seen as large-scale simulations under similar scrutiny. Advocates of gamified learning claim that learning through games can encourage group work, cooperation, and role recognition within "larger systems" – "If children can build, play and understand games that work, it's possible that someday they will understand and design systems that work. And the world is full of complicated systems." [2]. But while cooperation and identifying problems are real-world skills, some remain concerned that too much technology in education can lead to large-scale global generational gaps [2]. When a young, "tech-savvy" population accustomed to having a wealth of complex resources at its disposal and an older, intelligent generation raised without the luxuries of those resources interact, conflicts of communication are inevitable. This remains an ongoing concern in the technology and education debate.

Whether viewed as an open door to innovative learning or an obstacle to effective teaching, technology plays an indispensable role in education. This paper has addressed the

ethical concerns surrounding the use of technology in education by examining the contemporary issues of cost and effectiveness. It has also delved into the societal issues of security and discord both inside and outside the classroom. Finally, this paper has explored the overarching global ethical concern of the degree of life-preparedness afforded to students in technologically driven environments. As perspectives on education and the use of technological tools continue to develop and evolve, additional ethical concerns are likely to develop along with them. Both those working internally to better the quality of education in the modern world and those seeking to understand how laptops, tablets, the internet, and many other resources influence students must be prepared to address these issues, as neither technology nor education will cease to evolve to meet the needs of the modern student.

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