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In Praise of Less Technology: Taking a "Less is More" Approach in Virtual Classrooms

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Taking a "less is more" approach to technology adoption may seem counterintuitive for online education, but the intelligent integration of tools that enhance the learning experience for students can be achieved without ignoring technological growth. Educators must have a clear understanding of the goals of their classrooms and should then select technology that helps them achieve those goals. This goal-oriented approach is especially important for teachers who have been forced into online education due to the pandemic and are already in a state of overwhelm. Rather than letting technology become a distraction for teachers who must learn a plethora of new procedures, school leadership can provide their staff with a handful of thoughtfully curated apps that give teachers some sense of control in a quickly changing profession. This article offers school leaders and classrooms teachers research-based recommendations for selecting and integrating appropriate technology into their online classrooms, including creating effective and adaptable lessons that can withstand inevitable changes in technology; developing sound pedagogical principles for online learning; and fostering strong student-teacher (and student-student) relationships in virtual spaces.

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Interest in online K-12 schools was on the rise even before the COVID-19 pandemic, with enrollments growing at a rate of about 6% per year (Digital Learning Collaborative, 2019). By 2019, 32 states allowed for statewide online schools that provided full-time online learning, and 23 states offered supplemental courses via state-run virtual schools. These online schools offered nearly a million courses and served millions of students by leveraging educational technology. Learning Management Systems (LMS) and video conferencing platforms have the power to instantaneously connect students and teachers from across the country, introducing flexibility and individualization into sometimes rigid educational systems. However, there has been a growing trend in online learning toward continually adding more pieces of educational technology, as if yet another tool will make teachers more effective and students more attentive. New apps, "groundbreaking" programs, and add-ins that promise to "hack discussion boards/email/online submissions" are sold to online educators at an alarming rate. The pressure to test drive and then integrate tool after tool is intense, despite the industry-wide understanding that newer technologies often complicate teaching, especially for new or pre-service teachers (Koehler et al., 2013).

In the wake of the global pandemic and a system-wide move toward online education, many teachers and educational leaders have found themselves up against this wall of new technology, wondering which tools are effective and which can be put aside. Kuehn (2015) and Schuster and Zimmerman (2014) described the paralysis that often comes from being overrun with educational technology as "app overload," a form of cognitive overload where users, inundated with choice, are unable to effectively process

information. While advances in educational technology are a necessity, taking a "less is more" approach in virtual classrooms allows teachers to focus on what is really important: creating effective and adaptable lessons that can withstand inevitable changes in technology; developing sound pedagogical principles for online learning; and fostering strong relationships in virtual spaces.

From a business standpoint, it makes sense that there is a deluge of new educational technology for online classrooms. With roughly 2.2 million American students enrolled in some form of online education (Evergreen Group, 2015), LMSs and accompanying apps are big money makers. According to the Software and Information Industry Association, American schools spend roughly $8.4 billion on software alone each year. Technology is marketed as a "silver bullet" for everything from mathematics to social-emotional learning. However, this exorbitant spending is not put to good use in most school districts: nearly 67% of educational software product licenses go unused, amounting to an annual waste of nearly $5.6 billion (Glimpse K12, 2019). In some school districts, nearly 90% of software purchases go unused. While the Glimpse K12 study focused largely on brick-and-mortar schools, it follows that both the high levels of spending and the subsequent waste exist in the world of online learning as well.

While the push for new technology is good for business, teachers should be asking whether this push is good for education. Both researchers and educational journalists have discovered that the presence of educational technology in brick-and-mortar classrooms leads to compulsive off-task Internet usage and ineffective multitasking (Aagaard, 2015; Berdik, 2018), and it is arguable that the pull of the Internet is even stronger in a fully virtual classroom. A qualitative study of virtual classrooms (Potts, 2019) found that even when students are aware of distractions, they are ineffective at self-regulation. These findings confirm earlier research (Terry, 2008; Winter et al., 2010) which revealed that distraction management in online learning is itself a distraction. Even tools that are staples of online education (e.g., web cams, chat boxes) have the potential for distraction. For example, Microsoft Teams has become an indispensable app at the fully virtual school where I serve as Curriculum Coordinator. We use Teams as a "digital hallway," as it is an ideal platform for communicating with students, posting schoolwide announcements and reminders, and sending files for use during our synchronous live sessions. It's safe to say that our school is richer for this app. However, it has also become a social back channel that students will use to chat during our live sessions, making it both an essential tool *and* an uncontrollable distraction. The incursion of more technology for the sake of technology opens up the potential for even more distraction.

For online schools that require synchronous meetings, the introduction of more educational technology also eats up valuable class time that should be spent on content materials. While similarities exist between popular apps, the functions of each new tool must be explicitly taught to students, since the myth of the "digital native" is nothing more than that (Boyd, 2014; Kirschner & De Bruyckere, 2017; Scharton, 2018). While Gen Z and younger students may be more comfortable using educational technology, they do not possess innate talents, and many students struggle with digital competency and media literacy (Boyd, 2014). Since even the most user-friendly apps come with their own learning curves, the skills are often non-transferrable, resulting in a waste of instructional time. There have been studies (Foote, 2012) that have found that taking an exploratory approach to technology can be beneficial for both teachers and students, but overpacked curricula pushed by high stakes testing rarely allow for this kind of scrutiny. Additionally, if a program or app doesn't integrate well into a school's chosen LMS, students will need to spend time navigating to different places and checking in on multiple platforms, both of which increase the possibility of time loss and distraction.

Even in fully virtual classrooms, offering students learning opportunities *away* from computer screens is preferable to adding another piece of technology. Excessive screen time is associated with depressed physiological and socio-emotional development; complaints of persistent back, neck, and headaches; negative dietary habits; and poorer mental health during adolescence (Domingues-Montanari, 2017). Unfortunately, researchers have found that "physical activity does not compensate for the adverse effects of screen time" (Domingues-Montanari, 2017, p. 333), meaning that the only way to avoid these problems is to reduce screen time. Rather than adding apps, online teachers can offer print outs, physical textbooks, or assignments that require students to explore the physical world around them.

While new technology should be introduced into virtual classrooms cautiously, technological progress will continue to march forward, and it would be negligent of online educators to ignore this fact. Indeed, new adaptations are vital in virtual classrooms, especially in the burgeoning realm of online lab sciences (Dickson-Deane, 2021). Exploration of new technology is an important part of an online program's responsibilities, but this exploration should not happen on a schoolwide level. Most new apps and programs don't come with traditional instruction manuals or training seminars, leaving teachers to learn most new technology via trial and error (Stevenson, 2017). Rather than overwhelm teachers with a list of new apps to try, schools should appoint individuals to serve as technology ambassadors, people who are willing to seek out and test run the latest advancements and

make recommendations regarding implementation. Ideally, these ambassadors should be veteran teachers who are comfortable enough with their content knowledge, pedagogical knowledge, and technological knowledge that they are not intimidated by either the intersections of these bodies or new information in any one body. The ambassadors can be sent to ed tech conferences, should be encouraged to pursue endorsements or certifications in educational technology, and can even be given additional prep time to both investigate technology and support teachers when they're ready to integrate a new program. Some schools and universities have already created these kinds of tech-forward positions, resulting in both experimentation and recommendations for "core apps" to be used across the curriculum (Stevenson, 2017). In this way, schools can effectively control inevitable changes to technology rather than resist them or get carried away with them. My fully virtual school has utilized the idea of tech ambassadors to great effect, with our most tech fearless staff piloting new apps, video conferencing software, and even learning management systems before any large scale implementation. One of our ambassadors pursued an ISTE certification, and she regularly runs small trainings on new apps and UDL best practices. Offering ambassador roles to experienced, passionate educators will keep the school abreast of the latest technological developments and allow the rest of the staff to focus on running their virtual classrooms.

Once viable technology has been selected on a schoolwide level, individual educators should carefully consider whether a tool or application will help them to be a better teacher. In a recent study, Montazami et al. (2022) found that teachers tend to select apps based on educational benchmarks rather than buzzwords, but they noted that there is a lack of standards for how to properly evaluate educational apps. In lieu of standards, teachers can ask the following questions as they make decisions about educational technology in their online classrooms: does this piece of technology help me reach my pedagogical and curricular goals? Does this program solve an existing problem? Does this app do something different or something better than the apps I am already using? In short, does this piece of technology *enhance* the educational experience for all users? For example, one of our tech ambassadors recently recommended Perusall, an app that allows for collaborative annotation and critical reading. Perusall proved to be additive for younger students who were new to annotation and needed extra scaffolding. Older students and those with well-established annotation habits found the app to be cumbersome, and the teachers of those students decided against adoption. It was crucial that our teachers be able to critically evaluate apps and make individual decisions about adoption based on the specific needs of their cohort of students.

For teachers who are also curriculum designers, the above questions become more pertinent, since new technology often necessitates curricular overhauls, even in online spaces. Occasionally, an outstanding piece of technology comes along that is worth designing around, but in general, curriculum specialists should resist creating lessons that rely on a certain app or program. Goldenberg (2000), an early pioneer in educational technology, recommended that teachers and curriculum designers be explicit about their goals in an online classroom *before* selecting their technology. For example, teachers who employ a flipped classroom model and rely heavily on instructional videos might want to set the goal of creating more opportunities for asynchronous interaction. This goal may lead teachers to select a simple tool such as a discussion board, or a more robust and video-centered tool such as Edpuzzle. What is crucial for designers to recognize is that there are multiple apps that can help teachers achieve this goal, and starting with an app in mind can be limiting and counterproductive. By focusing on curricular goals rather than technology, curriculum designers can create responsive, flexible curricula that can withstand the inevitable changes in ed tech.

While some of the latest ed tech simply delivers self-directed content material, the most effective technologies are the ones that create stronger connections between users. Numerous studies have found that teacher presence and interaction between students are vital to the success of students in virtual classrooms (Blaine, 2019; Ng & Nicholas, 2007; Ng & Nicholas, 2010; Potts, 2019). One meta-analysis revealed that the ability to perceive other users in an online environment impacted "student motivation and participation, actual and perceived learning, course and instructor satisfaction, and retention in online courses" (Richardson et al., 2017). While there are excellent new apps that enhance user interaction via voice and video options, even discussion boards can become a hub of connectivity when approached thoughtfully. Teachers who have explicit expectations and actively model the kind of interactions they want to see on asynchronous communication tools may find that they do not need to seek out yet another app. Instead, they should continue using the apps that offer the highest levels of connectivity with the least amount of complication.

At the dawn of online education, a mere twenty years ago, Goldenberg (2000) urged educators to "Keep a clear vision of what is desired of the technology, responsive to but not governed by the changes in what is possible with the technology" (p.8). These words seem prescient now that entire curricula can live in a virtual setting. Good teaching is good teaching, whether it is online or in brick-and-mortar classrooms, and most standard pedagogical practices can cross borders into the virtual world without the need of the latest piece of technology. However, good teaching in virtual spaces does require the careful selection of useful, additive technology, and leaders of online programs would

do well to scrutinize the siren song of "cutting-edge" apps. As one such leader, I offer the following recommendations: integrate new technology sparingly and slowly, making sure to test new programs with tech ambassadors. Actively resist technology that displaces human interaction. Create online curricula that are not reliant on a single piece of technology but can instead adapt to multiple tools and platforms. Seek out multiuse tech that solves many problems. When selecting new technology, give plenty of hands-on training to both teachers and students. Finally, remember that technology is the vehicle that connects students and teachers in online learning spaces; it is not the education in and of itself.

Taking a "less is more" approach to technology adoption may seem counterintuitive for online education, but the intelligent integration of tools that enhance the learning experience for students can be achieved without ignoring technological growth. The key is for educators to have a clear understanding of the goals of their classrooms, and to then select technology that helps them achieve those goals. Rather than letting technology become a source of overwhelm for teachers, school leadership can provide their staff with thoughtfully curated apps that give teachers some sense of control in a quickly changing profession. By embracing a "less is more" philosophy, teachers can start to see technology as a useful window into the minds of their students rather than an unclimbable wall.

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