

Challenges and opportunities for using technology in schools in US: Lessons for Cambodian Education

Bob Spires, PhD
Graduate Education Department
School of Professional and Continuing Studies
University of Richmond



Agenda

- Overview of the state of technology in US k-12 schools
- Opportunities for using technology in US k-12 schools
- Challenges for using technology in US k-12 schools
- Lessons for Cambodian Education

Overview

- **Varying levels of technology usage in k-12 schools in the US**
 - Most decisions and funding for technology is controlled at the State and Local levels (dramatic differences across the US)
 - Some schools have 1-to-1 technology (provide laptops or tablets to all students)
 - Most schools have wifi
 - Most schools have a Learning Management System (LMS) to deliver online instruction
 - Some schools have instructional designers to support teachers' use of technology in the classroom
 - Some schools provide ongoing technology training of teachers
 - Some schools provide tech resources to parents (online grades, online resources)

Overview

- **Tension between cutting edge technology used by businesses and technology taught in schools**
 - While many employers note the importance of students' ability to navigate technology in the workplace, most companies are less interested in sharing their own proprietary technology to train students, even at the university level
 - This issue pre-dates digital technology era, but still no agreement on which technology skills all students need
 - Employers and schools also note the importance of critical thinking and 'soft skills' to accompany technology skills
 - Problem solving, flexibility, collaboration, emotional intelligence, respectfulness, goal-setting, organization, adaptability

Overview- Technology frameworks and standards

- **Several key technology frameworks and standards-**
 - Inconsistently implemented
- **International Society for Technology in Education (ISTE)**
 - Standards for students, teachers and leaders- <https://iste.org>
 - Student standards focused on improving student learning using technology via- empowered learner, digital citizen, knowledge constructor, innovative designer, computational thinker, creative communicator, global collaborator

Overview- Technology frameworks and standards

- **Technological Pedagogical Content Knowledge (TPACK)**
 - Standards focused on combining appropriate technology to purposeful pedagogical usage and intentional content connections- tpack.org
 - Optimal usage of technology in the classroom is at the intersection of appropriate technology, purposeful instructional practices and meaningful content connections

Overview- Technology frameworks and standards

- **SAMR Model**

- 4 levels of technology integration into schools
 - Substitution- technology is a direct substitute for traditional teaching methods and makes no real change to learning
 - Augmentation- technology is a direct substitute for traditional teaching methods and makes minor change to learning
 - Modification- technology is used to redesign teaching and learning
 - Redefinition- technology transforms learning in ways previously impossible without the technology

Overview- Technology frameworks and standards

- **Technology Integration Matrix (TIMs)** <https://fcit.usf.edu/matrix/>
 - 5 levels of technology integration
 - Entry, Adoption, Adaptation, Infusion, Transformation
 - Across 5 domains
 - Active Learning, Collaborative Learning, Constructive Learning, Authentic Learning, Goal-directed Learning

Opportunities

- **Since the Covid 19 Pandemic**
 - Much more use of technology in schools
 - More training for teachers
 - More infrastructure to support technology in schools
 - Teachers are more thoughtful about use of technology to improve learning rather than as a distraction or substitute

Opportunities

- **Since the Covid 19 Pandemic**
 - Growing use of AI to improve teacher planning
 - AI to create formative assessment
 - Make assessments quickly and efficiently
 - AI to create lesson and unit plans
 - Reduce teachers' time planning
 - Free resources like MagicSchool

Opportunities

- **Since the Covid 19 Pandemic**
 - High levels of engagement with some novel uses of technology
 - Rapid formative assessment and student performance data analysis
 - Rapid access to good information
 - Teachers can organize and share activities and lessons in real time
 - Inclusive and interactive ways to engage all learners and hold all students accountable for learning

Opportunities

- **Since the Covid 19 Pandemic**
 - Less superficial use of technology
 - More recognition that technology will not replace quality teachers
 - More intentional and authentic collaboration
 - Global communication with experts and other students
 - More access to rich free resources, apps/software, websites, hardware

Challenges

- **Since the Covid 19 Pandemic**
 - Cyberbullying
 - Digital divide between rich and poor
 - Digital divide between urban and rural
 - Distraction of devices in schools
 - Disruption of school due to personal devices, inappropriate use
 - Use of AI by students on assignments
 - Funding
 - Corruption, self dealing

Challenges

- **How are teachers and leaders dealing with these challenges?**
 - Cyberbullying
 - Monitoring of school devices
 - Wifi filters and web security
 - School counselors
 - Police involvement
 - Difficult to address cyberbullying that happens off campus or after school hours

Challenges

- **How are teachers and leaders dealing with these challenges?**
 - Digital Divide (Rich/Poor) (Urban/Rural)
 - Funding remains inconsistent across the US
 - More care taken regarding schoolwork that would be difficult at home if student does not have access
 - Using both low tech and high-tech alternatives
 - Some communities provide free wifi hot spots

Challenges

- **How are teachers and leaders dealing with these challenges?**
 - Distraction
 - Strict rules about misuse, clear consequences
 - Some schools, regions have begun to ban cellphones in schools, or only during limited time
 - Strong wi fi filters and cyber-security to protect students
 - Sometimes parents do not agree with teachers and leaders
 - Teachers and leaders should be consistent and clear about policies and goals of using technology and consequences for using technology inappropriately

Challenges

- **How are teachers and leaders dealing with these challenges?**
 - AI
 - Passive Learning
 - Some schools have programs to check for AI or other plagiarism
 - Some schools focus on intentionally showing students how to use AI ethically
 - Some schools are overtly addressing the ethical implications of AI (data centers, environmental factors, water usage, privacy, copyright)
 - Some schools are overtly addressing media literacy, critical use of online sources, cyber-safety

Challenges

- **How are teachers and leaders dealing with these challenges?**
 - Funding
 - Technology companies have made fortunes in the US off of public k-12 schools (LMS, Apps/Software, Devices, trainings, test preparation tools, IT Security +)
 - Without clear guidelines on use, actual impact on students may not actually emerge with technology
 - Hacking, viruses, malware has been expensive, and resource and time intensive

Lessons For Cambodian Education

- **Technology alone cannot replace good teachers**
 - Teachers need effective training on how to use technology in the classroom to enhance learning, not replace or distract from learning
 - Teachers need professional freedom to decide **when** and **how** to use technology to support student learning
 - Teachers need the freedom to **not use** technology if it will not enhance learning
 - Leaders need to be consistent about technology expectations
 - Leaders need to be equitable about resources and infrastructure
 - Teachers must be aware that even as schools improve technology usage, not all students may have access to the same technology or resources

Lessons For Cambodian Education

- **Technology alone cannot replace good teachers**
 - Technology must accompany well organized and intentional curriculum
 - Technology must accompany other rich learning opportunities inside and outside the curriculum
 - Teachers must be intentional about the ways technology can enhance learning, not just act as a substitute
 - Teachers must differentiate student engagement from student academic progress when using technology
 - Engaging teachers without technology are more effective than unengaging teachers with technology

Lessons For Cambodian Education

- **Technology in schools brings opportunities AND challenges**
 - Teachers need support from leaders to deal with issues, distractions, barriers proactively
 - Leaders must address the likely challenges (distraction, cyberbullying) overtly and proactively
 - Teachers and Leaders must be proactive and clear in communications with parents, students and community
 - Clear goals and objectives for using technology
 - Clear consequences for misuse
 - Intentional use of technology for learning
 - Don't assume only good comes from using technology
 - Committing to moving from beginning level (superficial use) to engaging, intentional and transformative

Lessons For Cambodian Education

- **Technology in schools brings opportunities AND challenges**
 - Teachers need support from leaders to deal with issues, distractions, barriers proactively
 - Leaders must address the likely challenges (distraction, cyberbullying) overtly and proactively
 - Teachers and Leaders must be proactive and clear in communications with parents, students and community
 - Clear goals and objectives for using technology
 - Clear consequences for misuse
 - Intentional use of technology for learning
 - Don't assume only good comes from using technology
 - Committing to moving from beginning level (superficial use) to engaging, intentional and transformative levels of technology implementation in schools and classrooms

Lessons For Cambodian Education

- **Final Recommendations**

- Effective teaching can still occur with or without technology
- Sharing ideas amongst teachers, leaders and schools is crucial
- Don't assume technology will improve learning if purpose is not clear
- Experiment but use formative assessment to determine effectiveness of teaching and learning with or without technology
- Be intentional about moving from beginning level of technology implementation toward advanced level consistently (no need to rush-trial and error is key)
- Be consistent, clear and overt about purposes of technology in learning, guidelines for use and consequences for misuse



Bob Spires, Phd

bspires@Richmond.edu