
Technology and the Classroom: Benefit or Hindrance to Social Maturation?

Scott P. Handler

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Introduction

A large focus in the education community has been about the importance of creating a digital learning environment (Roberts 2008; Skipton 2006). But, has the fascination with technology, for technology sake, overshadowed analysis of how to effectively use technology to enhance learning and understand the limitations of technology on student development? What does technology actually do to help learning, what type of learning does it help promote, and does it hinder other types of learning? In higher education, particularly at the U.S. Military Academy (USMA), and peer institutions,¹ the educational mission is to develop our nation's future leaders who are critical readers and thinkers who can adapt to a politically, economically, socially, and technologically changing world (Dean 2007). Does technology contribute to the type of learning or development that develops the skill sets to achieve this mission, or is technology in the digital classroom better suited for developing lower level learning skills, such as functional literacy and basic quantitative skills? Also, what is the impact of technology on the cognitive abilities of students? This paper will explore recent literature on the topic of educational technology to further explore the impact of that technology on student learning.

¹ West Point is not the only university that seeks to develop graduates who will serve the nation in their future careers. The founding grant for Stanford University states that the purpose of the university is, "to promote the public welfare by exercising an influence in behalf of humanity and civilization, teaching the blessings of liberty regulated by law, and inculcating love and reverence for the great principles of government as derived from the inalienable rights of man to life, liberty, and the pursuit of happiness" (Stanford University 1885).

What is Educational Technology?

People have talked about technology and education for a long time. Whenever new technologies come along, people try to think about how to utilize the technology to improve education. Such technological devices include the slide rule, mimeograph machines, overhead transparency projectors, calculators, VCR players and TV, computers, PowerPoint, iPods and podcasts, and today the latest buzz is about tablet devices. Most people generally have a definition in mind for what technology is and what education is, but what is “educational technology,” which is a growing term amongst participants involved with institutions of higher learning.

Even amongst educational technologists, a debate exists over this term, yet a consensus around an interpretation of the term has emerged (Simsek 2005). The most common usage now is broadly focused on the “technology of education” over “technology in education.” This places emphasis on the learning-teaching process and the learning resources that enable that process. Some have used educational technology to include not only tools, but also materials and messages that support effective learning and instruction, including hardware and software (Percival et al. 1993). But, such a broad definition, which encompasses nearly everything related to education, of educational technology provides limited use for understanding how the use of technology in education affects social maturation. A broad definition not only makes measurements difficult, but including everything also raises the expectations about what educational technology can achieve. This has led others in the field to focus on technology platforms when discussing educational technology.

The early wave of ideas related to using platforms to enhance learning focuses on the technological environment in each classroom. The underlying belief is that the current generation of college students is largely composed of digital learners. Therefore, schools must keep with the times and incorporate all forms of the latest hardware into the physical learning space to support the preferences and learning style of this generation. According to this argument, institutions should respond to the demands of the “What’s In It for Me” generation and provide multimedia and social networking opportunities into a “Smart Classroom” with a single control interface for all devices, implying that a standard lecture or seminar space with blackboards is a “Dumb Classroom” (Skipton et al. 2006).

To help achieve adoption of technology and to build such classrooms, some technologists argue that institutions must overcome the resistance of educators to incorporate new educational technologies. To surmount this opposition, schools should establish a strategic planning process for the implementation of educational technology solutions. The process would include four stages: 1) strategic analysis; 2) strategy making; 3) strategic plan design; and 4) implementation of the

plan. According to its proponents, this process would allow institutions to choose the technology that best fits the learning goals of their teachers while working within the system to overcome internal challenges to the adoption of new technologies (Roberts 2008).

Others have taken both the smart classroom and strategic planning ideas further in order to expand the use of technology in education. In terms of physical space, evolving arguments about the role of technology in education are no longer physically constrained to a smart classroom, but now focus on harnessing globalization to expand the definition of the classroom. Education technologists now advocate for using technology to enable distance learning, learning-management systems, and collaboration with other students or researchers around the world. In terms of strategic planning, those seeking to harness globalization want to increase the role and importance of university Chief Information Officers (CIOs) by elevating their positions and including them in all major strategic decisions at universities. The CIOs would help expand corporate-academic partnerships and think about how technology should drive the future of education (Economist Intelligence Unit 2008). This drive is in part due to a non-inquisitive look at recent surveys that college students use technology now more than ever (Guess 2007). The educational technologists assume that greater use of technology enhances learning and that more technology is better than less.

Rather than just accepting technology blindly, most educators would like to know criteria that they can use to evaluate the usability of different digital learning materials or platforms. It is possible to evaluate educational technology according to two different criteria: 1) technical usability and 2) pedagogical usability. The first helps evaluate the ease of using the technology, while the second focuses on the kind of learning that the technology produces within the student. Currently, most evaluations of both technical and pedagogical usability consist of self-evaluative surveys. The belief is that such surveys allow for individual learners to choose the technology most suitable for his or her learning situation (Nokelainen 2006). This may be okay for determining ease of use, but may not be the best measure for understanding how well the technology facilitates learning. Besides evaluating the technology itself, it is necessary to understand the learning development process that takes place within individuals in order to better grasp the potential impact of technology on student learning.

What are the Processes of Learning and Social Development?

West Point's Cadet Leader Development System, now known as the West Point Leader Development System, uses Robert Kegan's stages of social maturity as the basis for understanding how cadets learn and mature. During the 47-month cadet experience, it is expected that cadets will

move to higher-level stages during that experience, and that the Academy should ensure that the designs of the academic, military, and physical training programs support and encourage cadet development and movement into higher stages of social development (Superintendent 2009). By supporting such development, the U.S. Military Academy achieves its mission of providing the U.S. Army with leaders of character prepared for a career of professional excellence as Army officers (USMA 2012). Further, the overarching intellectual domain goal at USMA states “graduates anticipate and respond effectively to the uncertainties of a changing technological, social, political, and economic world” (Dean 2007). Cadets will achieve this goal to varying degrees, some minimally and others excelling at it, due to different stages of development that each cadet achieves.

Kegan outlines six stages of development using Piagetian psychological theory (Kegan 1982). In order to achieve USMA’s goal, cadets should move towards Kegan’s higher stages. Kegan’s stages in the *Evolving Self* focus on how individuals make sense of their experiences to help them better understand the distinctions between themselves and others, making meaning out of life. These stages matter in cadet development because “development relates to increasing one’s ability to comprehend complexity in the environment and to integrate this complexity in a way that allows one to take action” (Superintendent 2009), which supports both the USMA mission and the overarching intellectual domain goal. For Kegan, the series of stages of social maturity begin during infancy and continue through adulthood, tracing the lifelong process of reevaluating the relationship between the self and others and the tension between inclusion and autonomy (Kegan 1982).

Babies are purely subjective at birth, meaning that they have limited capacity for self-awareness or to understand the concept of others. While still in infancy, babies move into the earliest stage of social maturity, the incorporative self, when they start to recognize that they have senses and reflexes and some sense of self emerges. The second stage, the impulsive self, occurs during childhood as children can start taking actions to fulfill needs and respond to impulses or reflexes, such as identifying hunger and the need to take action to overcome it. The child still is not aware that the parent exists independently of the child’s need to eat. At the level of university learning, students have at least achieved the third stage in Kegan’s model of social maturity.

The third stage, the imperial self, is when the child becomes aware of him or herself. At this point, the child is self-oriented. Before, the child just acted on impulse to satisfy a need, but now the child is aware that his or her self is what wants to satisfy the need, rather than a mere impulse. The imperial self becomes aware that it gains its desires by manipulating others to perform an action on

behalf of the child's self (Kegan 1982). Cadets at this stage focus on reciprocal exchange and fairness as they define their interactions with others. They see relationships as serving their personal needs, and they follow rules or take action to receive carrots or avoid sticks. Cadets at this stage want to be told what to do to get something and focus on performance rather than learning goals (Superintendent 2009).

In the fourth stage of social maturity, the interpersonal self, the person becomes other-oriented, meaning that one has to take into account the needs of others beside oneself. This is the period when the conscience develops. By recognizing that others have needs independent of the needs of the self, individuals develop the capacity to understand concepts like empathy, guilt, and shame; yet, the individual still does not understand how to rank the importance of needs between the self and others (Kegan 1982). Cadets in the other-oriented stage focus on how others view them, wanting to belong and have the respect of others. These cadets can reflect who they are and want to contribute to something beyond themselves. Being part of something beyond themselves matters more to them than a specific individual reward or punishment based on performance (Superintendent 2009).

The fifth stage, the institutional self, is the self-authored phase in which a person is aware that it is possible to determine when certain needs and actions, for the self or others, should take precedence over other needs or actions. This is when the individual takes on and commits to a values system or guiding principles to shape his or her actions. The individual better understands how to be part of a family or society and how to contribute to that grouping. Not all individuals achieve this level of social maturity, but those who do appreciate the importance of the legal, moral, and ethical foundations necessary for society to function (Kegan 1982). The few cadets who are at this stage take positive actions and avoid breaking rules in order to live up to or avoid violating an internalized set of values that guides their behavior. These cadets make decisions and commitments less based on rewards or punishments or for a sense of belonging to a group and more because it is the right or wrong thing to do based upon the individual's guiding principles or values (Superintendent 2009).

While the institutional stage is the conventional endpoint of adult maturity, Kegan also recognized that some individual mature beyond just understanding the need for value systems as guiding principles. The next, and last, stage on social maturity scale, the interindividual self, is the recognition that it is possible for multiple value systems to exist. These individuals can understand that others may act in diverse ways, but the others may still take action according to some set of guiding rules or principles to govern their behavior (Kegan 1982). The Cadet Leader Development

System does not discuss raising cadets to this stage before graduation as part of the 47-month development model, but one can assume that some graduates will eventually achieve this stage. USMA recognizes that many cadets enter West Point in the imperial stage and that the Army needs officers to be in the self-authored stage to be most effective in the contemporary operating environment (Superintendent 2009). Yet, few cadets attain the self-authored stage, so the cadet developmental model focuses on raising cadets to the interpersonal stage while still providing opportunities to raise some to the institutional stage. Social maturation and development occur in part due to external environmental conditions and technology is an element of that external environment.

How Does Educational Technology Contribute to Learning and Social Development?

As USMA has increased access to technology in the education, training, and living environments of cadets, what impact has that technology had on cadets? The literature that highlights the importance of technology begins with the assumption that learners know how they learn best and that learners are capable of choosing the technology most suitable to achieve their own individual learning goals (Nokelainen 2006). The data however does not support this assumption.

While a recent report by a non-profit group that promotes education technology found a greater usage of technology among college students than ever before, the actual data from the survey is not as glorious for technology as the report's findings suggest. Rather than making revolutionary use of the technology as the report suggests, students have only made evolutionary changes to their behaviors. Students may be savvy at social networking and online course management, yet they still want to keep that part of their lives separate from their educational experience. They may use social networking as a distraction in the classroom, but students do not want to be taught through social networking means. Students see online course management as a tool to facilitate learning, but not a replacement for actual teaching. While the assumption is that kids want more technology in the classroom, today's students only want moderate and well-planned usage of technology in the classroom (Guess 2007). Students recognize the limits of technology in improving teaching and learning.

As such, institutions may be better off spending more money learning how to use technology rather than just buying more hardware and software to wire new smart classrooms (Skipton et al. 2006) or elevating the university CIO to the top of the decision-making structure (Economist Intelligence Unit 2008). Most students believe that professors are less effective when they use technology poorly than when professors do not use technology at all. In response to the increasing demand to use more technology, academic institutions should devote more resources to training

faculty on how to choose the appropriate technology, if one exists, for the learning situation and then how to use that technology effectively. Rather than focusing on smart classrooms, technology should enhance the educational interaction between smart professors and smart students (Young 2004). Gaining a better grasp of how well specific technologies affect learning is important for developing a deeper understanding of how technology can enhance or hinder learning and social development.

As discussed previously, some educational technologists assume that today's college students are effective digital learners. Further, technology proponents argue that these digital learners rely on different learning styles and prefer tools, such as multimedia platforms and social networking, to enhance their learning (Skipton et al. 2006). Yet, these assumption also appear dubious. Recent research shows that digital multitaskers are actually less efficient and effective than non-multitaskers. The experiments conducted showed that multitaskers who followed several streams of electronic information had greater difficulty paying attention, controlling their memories, and switching from one task to the next than their non-multitasking peers. Multitaskers who try to do academic work while texting, instant messaging, surfing the web, checking email, and social networking are easily distracted and drawn to irrelevancy (Phir et al. 2009).

So, if digital multitasking reduces student performance on individual tasks, what is the impact on the learning and social development of these same students? According to Kegan's stages of social development, most people will achieve the imperial (self-oriented), interpersonal (other-oriented), or institutional (self-authored) stage of social maturation (Kegan 1982). At West Point, the 47-month cadet development model is based on the assumption that most cadets arrive at West Point in the imperial stage and that while the goal is for graduates to attain the self-authored stage, the Academy recognizes that most will only reach the interpersonal stage by graduation (Superintendent 2009).

Recent research warns that an overreliance upon digital technology may actually retard the learning and social development of today's youth generation. The digital age may have this effect for several reasons. First, the ease of access to information satiates this generation's desire for instant gratification, and they get drawn into the first piece of information that pops up without considering the validity of the source or data. Second, this generation does not know how to assimilate and integrate the large volumes of information they have access to, so they have not developed the ability to critically choose and analyze information. Third, today's youth use the technological resources available to them (hardware, software, and networks) for trivial matters rather than serious research or thoughtful reading, so they have lost sight of the importance of civic

culture, history, politics, and context. Finally, learning development and social maturation processes are slowed down because this generation uses technology to enhance peer-to-peer relationships rather than generating mentee-mentor relationships, mimicking the behavior of peers rather than emulating learned elders (Bauerlein 2009).

Conclusion

As with everything in life, moderation is usually the best course of action. The same appears to be the case with educational technology. While many schools want to have the latest gadgets and to reach out to how each successive generation thinks and operates, it is important to first understand how this generation actually thinks and operates. Educators must also understand what impact specific technologies can have on this generation's learning and social development. With the continual onslaught of new technologies, such as iPads, tablets, and other devices, educators must take more care to learn about the technologies themselves before introducing them to the classroom.

If recent research is accurate and some technologies retard social maturity and lock kids into the imperial-self stage of social maturation longer than previous generations, we need to better understand what aspects of technology contribute to that. As educators, we then need to find ways to avoid the bad uses of technology and learn better or alternative uses that can enhance this and the next generations' learning and social development. If one of the greatest challenges is how technology satiates the youth's need for immediate gratification, we must find ways to lessen that in the classroom. Educators must seek a better understanding of how technology can enhance rather than distract from the processes of learning and social maturation. Educational institutions must do all they can to ensure that the institutions themselves are not the cause of slower learning and social development. Institutions can cause this through a failure to examine the actual efficacy of educational technology as well as an unwillingness to invest in the human capital needed to use appropriate technology in a manner that enhances the teaching and the learning environment.

Citations

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Annotated Bibliography

Bauerlein, Mark. (2009). *The Dumbest Generation: How the Digital Age Stupefies Young Americans and Jeopardizes Our Future* (New York: The Penguin Group).

Bauerlein warns of the way the digital age is changing how today's youth engage and assimilate information. The concern is that this generation may have greater access to all kinds of information, yet they do not understand how to integrate what they find in a meaningful way. Rather, the ease of access to information just reinforces this generation's need for instant gratification. Today's young Americans have lost sight of the importance of civic culture, history, politics, and context. Rather than using the resources of the web, today's young spend most of their time on social networking sites or gaming, and the kids have discarded the importance of thoughtful reading. In addition to the retardation of intellectual development amongst today's young Americans, the digital age has also impeded their maturing processes, or social development, by increasing horizontal connections and the mimicking of peers rather than vertical connections and the emulation of elder role models, such as parents, teachers, coaches, and other adults.

Economist Intelligence Unit. (2008). *The Future of Higher Education: How Technology will Shape Learning*. Available at: [http://www.nmc.org/pdf/Future-of-Higher-Ed-\(NMC\).pdf](http://www.nmc.org/pdf/Future-of-Higher-Ed-(NMC).pdf). Accessed April 12, 2012.

The Economist Intelligence Unit collaborated with a group focused on furthering the role of educational technology in the classroom, the New Media Consortium, to produce this report about the role of technology in the classroom. The report focuses on the opportunities that technology is creating for higher education, specifically highlighting the role of technology in enabling distance education, learning-management systems, and the ability to collaborate with others. The report recommends that universities take technology even more seriously by including Chief Information Officers (CIOs) in all major strategic planning and decision-making processes for universities. CIOs should not just install technology solutions, but should help shape the future of universities based upon technology. The authors also believe that corporate-academic partnerships are the future of the educational experience, because this will provide universities with access to the latest technology, help corporations shape the education they need future employees to have, and increase employment paths for future graduates.

Guess, Andy. (2007). "Students 'Evolving' Use of Technology." *Inside Higher Ed*. Available at: <http://www.insidehighered.com/news/2007/09/17/it>. Accessed April 12, 2012.

Guess discusses the implications of a recent report by a non-profit group, Educase, which promotes educational technology that found, unsurprisingly, that college students use technology now more than ever. However, that general finding masks the underlying data, which provides a more nuanced perspective about how students use that technology. Students are making evolutionary, rather than revolutionary, changes to their technological habits. While 73.7% of college students have laptop computers, only about a quarter of them bring their computers to class at least once a week. Students today are very savvy with social networking and using online course management programs, but they prefer to separate their modes of communication for different purposes. They want to protect the personal nature of their social networking tools and prefer moderate, not extensive, use of technology in the classroom. Ultimately, "good teachers are good with or without IT and ... poor teachers are poor with or without IT."

Kegan, Robert. (1982). *The Evolving Self: Problem and Process in Human Development* (Cambridge: Harvard University Press).

Kegan's classic work on human development focuses on how individuals make sense of their experiences and the evolution that takes place as individuals try to translate their understanding of their experiences into something meaningful. Ultimately, that ability to comprehend the complexity of the world around them, and by making subject-object distinction, individuals can then take action. Individuals may evolve through three phase of development that are broken further into six stages of social maturity. Individuals move through the stages as they become objective, reducing their subjectivity, about how they view their experiences. This evolution follows from a self-oriented to other-oriented and finally a self-authoring perspective related to the standards and principles of behavior that one follows. This reading is important for educators in that it helps one understand how students develop and how they view learning, which is an experience that they must translate into action.

Nokelainen, Petri. (2006). "An Empirical Assessment of Pedagogical Usability Criteria for Digital Learning Material with Elementary School Students." *Educational Technology & Society*, 9 (2), 178-197.

In Nokelainen's development of criteria for evaluating digital learning material, he provides a categorization for evaluation based on the usability of various digital learning platforms. One can evaluate learning platforms based upon their ease of use, or technical usability, or based upon the learning produced through the platform, or pedagogical usability. The rapid growth in digital

learning platforms and materials requires a better understanding of how these platforms can help achieve desired learning ends. Nokelainen assumes learners know how they learn best and argues that learners should understand the different criteria for evaluating digital learning platforms, particularly the pedagogical usability, to enable the learner to choose the learning material most suitable to the desired learning ends.

Phir, Eyal, Clifford Nass, and Anthony D. Wagner. (2009). "Cognitive Control in Media Multitaskers." *Proceedings of the National Academy of Sciences of the United States*: 106(37), 15583-15587.

Phir et al. conducted a series of experiments to determine how effective students are at multitasking. The current generation believes they are very effective at multitasking; however, the tests Phir et al. conducted of college students demonstrated that people cannot process many strings of information at the same time effectively. Multitaskers have difficulty paying attention and controlling their memory while switching from one task to the next. So, students become focused on irrelevant things and are much less efficient and effective at learning and task completion than they believe.

Roberts, Cynthia. (2008). "Implementing Educational Technology in Higher Education: A Strategic Approach." *The Journal of Educators Online*, 5 (1). Available at: <http://www.thejeo.com/Archives/Volume5Number1/RobertsPaper.pdf>. Accessed April 11, 2012.

Roberts argues that despite the ubiquity of technology in daily life, educators remain resistant to incorporating new educational technologies into teaching. To overcome this resistance, she proposes a strategic framework that would enable educators to choose the most fitting technology to support teachers' learning goals and to support the successful implementation and integration of the technology within the educational setting. A strategic planning process, designed to help organizations align activities with their vision and mission enables educators to align their learning goals with the technology that will enhance teaching activities. The four-step process includes: 1) strategic analysis; 2) strategy making; 3) strategic plan design; and 4) implementation of the plan. This process enables educators to facilitate decision-making and adoption related to educational technology that works within their system and overcome internal challenges to technology adoption, such as resource scarcity, faculty resistance, and organizational culture.

Simsek, Nurettin. (2005). "Perceptions and Opinions of Educational Technologists Related to Educational Technology." *Educational Technology & Society*, 8 (4), 178-190.

Simsek discusses the confusion over what technology means in education. The purpose of the article is to explain the different perceptions that exist, and how they have evolved, about the concept of "educational technology." He argues that creating clarity about the concept matters because expectations about educational technology impact the direction of the development of educational technology. For some, educational technology is limited to the tools, materials, or messages that enable learning, of the "technology in education." Others, however, see instead "the technology of education," holding an all-encompassing perspective that defines technology as anything related to or part of the teaching-learning process. Simsek is sympathetic to the latter view and holds that educational technology is not just hardware or software products, but also the materials and methods of instruction.

Skipton, Charles, Erika Matulich, Raymond Papp, and John Stepro. (2006). "Moving from "Dumb" to "Smart" Classrooms: Technology Options and Implementation Issues." *Journal of College Teaching & Learning*, 3 (6), 19-27.

Skipton et al. base their paper on the assumption that today's college students are largely digital learners, and as such they are visual and kinesthetic learners who prefer and learn best through multimedia platforms and social networking. So, they argue that teachers must adapt the classroom to meet the learning style and preference of students whose mindset is based on "What's In It for Me (WIIFM)." Skipton et al. argue that institutions need to create physical learning spaces that accommodate the digital learner, believing that schools should respond to the demands of students for a wireless environment that allows them to communicate with each other over the Internet and research topic on the web during class. The "Smart Classroom" consists of the full integration of all instructional technology and the ability to control these devices through a single interface.

Young, Jeffrey R. (2004). "When Good Technology Means Bad Teaching." *The Chronicle of Higher Education*, 51 (12), A31. Available at: <http://chronicle.com/article/When-Good-Technology-Means-Bad/10922>. Accessed April 12, 2012.

Young argues that the focus on technology in the classroom should not be about building smart classrooms, but rather technology should enable smart teachers and smart learners to enhance educational interaction. Most institutions have spent millions of dollars building smart classrooms, while spending little time or money on training professors how to effectively use the available technology. The results of student surveys demonstrate that most students believe the poor use of technology actually makes professors less effective than if they did not use the technology at all. At

the same time, students complain when professors do not use technology, resulting in a vicious cycle of professors using technology they are uncomfortable with. In order to make educational technology a useful tool to enhance learning, institutions must invest time and money in teaching professors how to effectively use different platforms and the conditions under which the technology—hardware and/or software—is most useful.

Additional Resources

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