

## Evolution and Technology

At what point does an idea, innovation, or action become technology? The simplicities within the question may rest upon one's definition of technology. The term refers to the application of knowledge for some practical purpose (New Oxford American Dictionary). The reason for the question is to pursue a different path for seeking reasons why technology comes slow to education, fails to transform learning, and to propose new methods for integrating technology in the classroom.

Jared Diamond, in *Guns, Germs, and Steel*, examined technology's role in human societies by addressing the maxim "Necessity is the mother of invention". Diamond spun this notion that technology exists not simply as a matter of necessity, but rather as a product of innovation, trial-and-error, and the opportunity to do so; making invention the mother of necessity. When some innovation is applied to practice and alters the course of how that practice is done, things change, and needs arise. Diffusion occurs and the impact of the innovation ripples through society. Societies, Diamond claims, that offer the most opportunities for individual and group engagement in innovative exploration will be the most advanced societies.

As a society, for example, we've become enamored with the gadgetry behind electronic tools that some corporation has purposed for us. Technology as it is "seen" today generally exists in the mobile devices, e-readers, social- and multi-media consuming electronics that flood consumer markets. These devices are both the supply and demand of themselves. Marketing seems to be a very simple business for these products; people are told what they want, and then they are shown a product that is tailored to be everything they're told they want. This perspective is quite ingenious, because to sell a new product, all companies have to do is either make a product that does those things better, or re-define what people want. But is that all we are? Are we really a society comprised of mindless, thoughtless consumers? Do people always jump on board with technologies for their transformative qualities?

Of course... Sometimes... Well, not really. Actually, it's pretty rare that innovative concepts are employed, even though their use may revolutionize current activities, behaviors, and practices. My daughter, Carmen, who is three years old, loves *A Bug's Life*. This Disney/Pixar animation is one of my favorites as well, due to the masterful story and the messages that can be gleaned from the characters. A favorite scene is the opening harvest showing every ant in the colony (except the royal family) engaged in harvesting the way it had always been done, marching in line to deliver seeds to the collecting spot. Meanwhile, Flick (main character) is harvesting grass seeds at a rate that is obviously 10+ times greater than his fellow citizens of the colony using a homemade contraption constructed for this purpose. However, when his machine ejects the stem of the grass, it launches directly at the princess, knocking her down. Flick, unaware of his actions, comes scurrying apologetically.

The lessons from this story are applicable to all audiences and consecutive viewings can be rewarded by discovery of new messages. This theme that technology is not always accepted and appreciated, regardless of the societal implications it may offer, catches us off guard. Flick was rebuked for being innovative, eventually being cast out of the colony. Humans (or ants) can be dumb, stubborn, and so rooted in the status quo or the powers

that be, that the most obvious benefits to mankind can be overlooked for a change in practice. Is there evidence of innovators being cast out of society -- or worse -- because of an innovation? History abounds in examples!

It is possible that this definition has become something different; something less complex. Despite the sophistication that exists within the design of Web 2.0 applications, interactive whiteboards, and especially the hand-held supercomputers that many of us wave around, this is not technology. Even though the tools are complex, the definition has become too simple.

Without being overly critical of people's use of technology, the reason for the statement is to reflect the underlying nature of technology and the role humans play in its deployment and employment. Presumably, if a product fails to meet expectations of consumers, it fails to establish a market, or even a share of a market. This process of consumer selection can be likened to Darwinian evolution, where the weak and poorly adaptable fall away and only the most fit technologies survive for the 2.0 version. But is the same true for speciation? Have new technologies arisen out of consumer demand for a certain attribute of technology?

Music has been central to society since societies began forming. In recent centuries, the value of musicians, composers, and concert performances arose out of the advancement of the value of music and its ability to create shared experiences. Since Edison's phonograph, it has been the people's demand for music that has driven the pursuit of more mobile forms of music availability. Technological innovation regarding people's desire for music is an interwoven path of selection and speciation, with live performances fading away in preference for DJ'd music spun from records, to 8-track players in cars, to the Sony Walkman, to the iPod. Yes, there are several jumps within and across the stages that are missing, but the point is that people drove the rise and fall of innovation by adopting and dismissing technologies based on the purpose behind how they wanted to consume music. However, "I want to listen to Zeppelin anywhere I am" has not diminished the "I would love to see Zeppelin in concert". People's desire for music holds onto the social value of the availability of music. Music serves a purpose in society and culture.

The central idea here is that without purpose, there is no need for a tool. If there were no need to drive nails, there would be no need for a hammer, nor any other power implement that does that function. Similarly, without a desire for social networking, there would be no need for the vast array of electronic and web based devices that serve that purpose. So despite the seemingly mindless engagement in social media and consumption of devices that enable this, humans do still retain control over themselves in light of a technology-driven perception.

This perception, especially prevalent in high schools across the country, is that people (teenagers) are so connected to their technology and mobile devices that they cannot act on what is of highest importance: sleep is lost, family is discarded, school and academics are devalued. Instead the purpose that technology has imposed upon their socially-wired brains has consumed them. If this statement seems off, watch as a high school is being dismissed for the day, and every student clambers for their cell phones, iPods, smart phones, etc. There is something amiss regarding what is known to be true about technology and what is happening in reality: even though people determine the purpose

of a tool, and therefore determine its value and success in the ecology of technology in a society people continue to instead be directed by technology.

Consider another avenue, the classroom. Despite the role technology plays in our culture, it has left learning intact. Technology has forever been shoo'd by school teachers, administrators, and experts who claimed that certain technologies would lead to a diminished academic experience. An example of this was the resistance to the ball-point pen resulting in decreased retention due to the reliance upon notes. However, even though most educators would agree that learning is much more than consumption of content and subsequent recall, the pedagogy has not progressed very far to meet that consensus.

Educators who recognized that the purpose of the pen could be for more than writing down things that should be remembered, began using it to allow for thought projection and development. Written thoughts are expressed thoughts. Expressed thoughts demonstrate growth of learning and understanding. The purpose of the tool transformed learning. The sea of examples containing implications of technology on learning is as vast as it is deep. As technology continues to develop down paths of strict market consumption, we must consider the role purpose plays.

As schools continue to resist innovations, technology is purposed based on the superficial desires of society. Students cannot fathom the ways in which cell phones can be used in the classroom. To them and most adults, their purpose is for texting, photo sharing, Facebook, and, to a lesser degree, talking. These things have been purposed by the culture in which they grew up in, and it is nearly irreversible. As tools become more available to schools and classrooms, the lack of a purpose centered on learning becomes the bulwark of integration -- for students, teachers, and parents.

A recent push for technology in learning is the concept of educational gaming. Researchers such as James Paul Gee have placed a significant emphasis on the potential for learning in an environment to which children so naturally ascribe their focus, attention, and energy. However, at its core, educational gaming is an effort to repurpose technology for something for which it was not intended. Young children recognize the superficiality of educational games and will not perform as well there as they would in HALO 4 (or whatever).

If purpose is the reason for the existence of technology, then it also determines the value of the technology. Not to be misconstrued for demand, purpose is simply how the technology is leveraged. Using this as a construct provides insight into that point at which technology takes its place in society, and therefore insight into the selection and speciation of technology. It is there that we can begin to unfold the layers of difficulty educators and administrators have had trying to transform learning through integration into the classroom. It seems many questions have gone unanswered at the conclusion of this critique. This is by design. The hope is that more questions arise and lead to academic pursuits which will hopefully lead to more directed approaches to technology integration and development within classrooms.