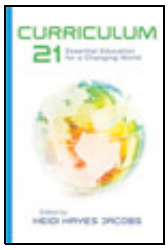
Curriculum 21

Edited by Heidi Hayes Jacobs

Table of Contents



Chapter 5. Five Socio-Technology Trends That Change Everything in Learning and Teaching

by Stephen Wilmarth

This chapter is about technology. But it's not only about integrating technology into the curriculum. It's also about social trends and how technology is influencing these trends, and what the implications are for culture, society, learning, and teaching in the 21st century. We live in an age of transformational communications technology. Our world, and all of its many cultures and ways of thinking, is smaller and more connected than ever before in human history. This chapter seeks to define and contextualize how technology and the social adaptations to new technologies change learning and teaching going forward.

In times of great change, it's not unusual to miss the obvious. So I write here about technology trends and the social adaptations that will have profound effects on education in the 21st century. New technologies combined with social and cultural adaptations fundamentally change our understanding of knowledge, its creation and authority. As educators, we have a duty to examine the effect of these trends and respond to the question, "What does it mean to be educated in the 21st century?"

Today's student, nearly everywhere in the world, lives in a technological era in which the Internet and Google and text messaging never *didn't* exist. New technologies result in ubiquitous connectivity and the pervasive proximity of unstructured relationships. As a result, the experience of today's student is the opposite of our own literate-grounded experiences of linearity and hierarchical structures of knowledge commonly accepted and institutionalized in the educational systems that were developed generations ago and that serve as the framework for today's system of education.

All learning is social. It was technology—the development and adoption of a symbolic alphabet—that ended an era of "orality" and began an era we call "literacy." It was technology—the development of moveable type and printing presses—that ended an era of scholastic authority by a selected priesthood and created mass literacy in the vernacular of every culture. And it is dramatic new technology that once again is altering the landscape and redefining our notions of literacy.

Be assured, I am not advocating that children do not need to learn to read. They do. Or that writing will not be necessary. It is. Or that the process of arriving at sums no longer matters. It does. But all of these things are the outcomes of social adaptation to prior technological change and invention. It is the nature

and relevance of reading, writing, and sums that change as we enter the postliterate era. Significantly, it is the way in which we make meaning out of information to create new knowledge that is changing.

Social Production

In July 2008, Google engineers announced that they believed there were 1 trillion unique URLs—the unique address of a Web page (Perez, 2008). In the same announcement, Google engineers estimated that the Web is growing by several billion individual Web pages per day. There is only one explanation for the incredible rate of creating, copying, mixing, and remixing of information available to anyone with an Internet connection, and that is the raw power of *social production* to create information and knowledge artifacts.

Within an incredibly short time—less than five years—the real cost of publishing and reaching a mass audience has dropped to nearly zero. This frictionless world of Web 2.0 self-publishing has created a profound change in how we view the role of producers and creators (O'Reilly, 2005). The proliferation of types of social media, through which an entire participatory culture has sprung up, confounds our traditional notion of literary authority.

Are students improving their ability to think critically, to express themselves, and to develop usable literacies by participating through blogs, wikis, podcasts, video productions on sites such as YouTube, e-mail, text messaging, and shared online photostreams (Jenkins, 2006b)? While this question of improved literacy is hotly debated, there can no longer be a debate over the fact that amateurs, not professional writers, developers, artists, or programmers, produce the vast majority of Web content. Our students are no longer primarily consumers of content. They participate as content creators at rates never before seen. And the trend is accelerating.

Because the World Wide Web is designed to link together digital knowledge artifacts in any fashion imaginable, old systems of creating order out of chaos no longer apply. Where once we depended upon domain experts to categorize and organize knowledge, this task is now handed over to everyone. And the results are stunning! The power of the digital disorder (Weinberger, 2007) that arises out of all knowledge being everywhere at once makes the human capacity for pattern recognition, for critical thinking, for nuanced perceptions, and for dealing with ambiguity far more important than the search for certain outcomes (Edelman, 2006). We're forced to replace the metaphor of a tree of knowledge, organized in a Dewey decimal–like fashion, with a cloud metaphor as participants in the information bazaar reconstruct the relevance and relationships of knowledge artifacts in ever-changing shapes and patterns.

The tools and technologies of social production tip the long-held, customary balance between creators and consumers of information and culture. Participatory culture means learning takes on a more active role rather than the traditional passive mode. Producers and consumers converge and interact in new ways. The proliferation of devices that merge media types—news feeds delivered over cell phones, video downloadable from YouTube to iPods, global positioning devices that search for restaurants and display menus—don't strengthen mass culture; they destroy it. Everyone participates, and each stands on the shoulders of others to create their own unique version of culture and reality.

New art forms emerge from the proliferation of social media on the Internet—the mashup. Mashups are information formats of a different ilk brought together to create new perspectives and new ways of comparing, contrasting, and recognizing patterns. Mashups have no artificial limits. The participatory culture spawns new ways of putting together information at an ever-increasing rate.

For example, Google Earth takes highly detailed satellite images and three-dimensional landscapes to give us a useful and elegant way to surf an atlas of our home and neighborhood, ocean depths, even the moon

and Mars. As impressive as that is, it's not the ultimate power of this tool to teach and inform. The real power of Google Earth isn't in its imagery. It's in its participatory nature. By providing APIs (application program interface codes) to anyone who requests them, amateurs and professionals alike can combine photos and video and blogs and wikis with stunning Google Earth imagery. Participants create their own representations of geophysical-informational knowledge. The wonder of Google Earth is not that so much rich information about people, places, and culture is available to anyone with a computer; it's that all this information is the result of a global, collaborative, work-sharing effort. And the product is free to the ultimate beneficiaries.

Collective intelligence, and the means to tap into it, fundamentally shifts knowledge paradigms through concepts such as mass collaboration, prediction markets (Surowiecki, 2004), and crowdsourcing (Tapscott & Williams, 2008). What are some examples of the power of mass collaboration, the use of prediction markets, and applications of crowdsourcing? Arguably, with more than 2.5 million articles in English and millions more articles in dozens of other languages, Wikipedia is a modern miracle of mass collaboration. The *Wall Street Journal* has reported that General Electric uses prediction market software from Consensus Point to generate new business ideas (Totty, 2006). Dell gives over its computer product research and design functions to its customers, an example of crowdsourcing. The Democratic National Committee launched FlipperTV in November 2007 and McCainpedia in May 2008 (Link, 2008) to crowdsource video gathered by Democratic trackers and research compiled by DNC staff and put it in the hands of the public for any purpose they chose, for example, for a blog post or to create a YouTube video.

Especially as it has evolved since the mid-1990s, the open-source software movement has been the most visible evidence of a shift to collective intelligence through a radical redistribution of social production technologies. Today, thousands of software products are developed by groups of people over distributed networks that make the World Wide Web a cornucopia of productive applications, most of them free under a Creative Commons license, or available at a nominal cost. The more open and distributed the network, the more productive it becomes. Corporations are changing their strategies and redefining missions based on the recognition that social production is an enormously competitive force.

And the phenomenon is no longer reserved for open-source software. Like a highly contagious virus, open sourcing has become the most dominant strategy in globally competitive markets, from product and service design to high-touch customer services. The project team of nearly every corporation in every market is likely to consist of representatives of suppliers, customers, and, yes, competitors! There's even a new word to describe when normally competitive companies work together: *co-opetition* (Bowser, n.d.). The power of open-source social production is routinely applied to designing, organizing, producing, marketing, and supporting products and services, even without the need for formal organizations (Shirky, 2008).

So what does all this have to do with learning and teaching in the networked global knowledge economy of the 21st century? Each of us, from the moment we create a blog post, contribute to a wiki, set up a MySpace or Facebook page, participate in a chat room, upload pictures to Flickr from a cell phone, make a podcast and post it on iTunes, Twitter with friends, or create a video clip for distribution on YouTube, is a producer of content and knowledge in our connected universe. Social production is a "back to the future" phenomenon applied to learning. This is the apprenticeship model of learning. It is *learning by doing*. It occurs without the need for base knowledge. It is just-in-time learning as you go. It occurs beyond the formal rules and classrooms of traditional education.

Social Networks

Social production has exploded exponentially since 2000 and the mass production of Web 2.0 applications such as blogs, wikis, and other collaborative, interactive tools. Social production is enabled by the incredible

power of networks to connect people.

As the Internet has evolved and multimedia forms of person-to-person and group-to-group communications —e-mail, online chat, text messaging, RSS feeds, photo sharing, video streaming, podcasting—proliferate, the implications for mediated connectivity within society have changed. What was thought of as strong and weak ties between members of a social network began to shift as new media for communication became popular. The importance of weak ties to generate heterogeneity in relationships has steadily grown (Haythornthwaite, 2005). As weak ties tend to connect affinity groups within homogeneous interest areas to new ideas, to different ways of thinking, and to innovations in previously disconnected groups, the Internet has generated a profound change in the complexity and value of social networks.

The new power of social media and networking technologies to teach is perhaps the least leveraged technology in formal education systems today. Social networking technologies are powerful tools for enhancing the process of *learning to be*, of defining our identities. Digital social networks are now an essential part of the experience of everyone under the age of 20. Digital social networks may be the biggest game changer in learning and what it means to be educated. And yet the power of social networks to influence the nature of learning and teaching is barely understood by our institutional leaders.

All learners create an identity that determines their place in the social and economic order. Joining communities of interest and shared values (personal, family, cultural, political, economic) has always been essential to a learner's identity. In this case, identity equates to where an individual is on the learning curve. And where traditional community relationships once defined a learner's identity, emerging social networking technologies allow wholly new community associations to spring up organically and globally. These community ties, both strong and weak, exert a powerful influence on learning.

First, keep in mind that social networking technologies are changing rapidly. Second, remember that the technologies are not the point. In social networking, it's important to concentrate on relationships, not technologies. The way people connect with each other—the community that's created—determines how the power of learning shifts. If a technology makes connections more interesting, more varied, or more frequent, it is likely to be more widely adopted and have a disproportionate effect on the creation of dynamic learning communities. Social learning communities spread virally as existing participants recruit new learners to join them. Since its launch in 2003, the popular online social networking community Facebook has grown to 200 million users worldwide. But even more impressive statistics reveal that this community has more than 24 million photos uploaded daily, and more than 6 million active user groups interact on the site. Many of these user groups are related to educational activities and formal learning institutions. YouTube.com is another application of social networking with impressive viral growth statistics. Twitter.com is a service that permits people to broadcast and subscribe to a constant stream of content through mobile phones. Each of these social media applications presents new challenges and opportunities to traditional learning communities.

Do social media applications shift power and responsibility for learning from institutions to individual learners? Writer Clay Shirky (2008) eloquently describes the power of social media to organize without the need for organizations. Social networking and the rapid adoption of social media do indeed demonstrate a trend toward sustainable community-generated content with the power to greatly expand self-determined learning opportunities. The World Wide Web is becoming increasingly social. This sociability is, in turn, making the Web more open and connected, allowing applications to be more socially aware.

The identities created by self-determined learners using all of the available social media are scattered across the Web. An interesting exercise for anyone, student or teacher, is simply to Google (at what point in the evolution of language did the word *Google* become a verb?) your own name. Want to know where you are on the learning curve? This is one indicator—and an increasingly important one for potential

employers, university admissions offices, and just plain curious neighbors. In effect, everyone has an electronic portfolio today. Many are empty or sparse, but an increasing number of people, particularly those who are writing, doing, thinking, or acting in public and not-so-public ways, are building extensive electronic portfolios.

So let's think about this for a minute. Our national and state policies are focusing increasingly on high-stakes testing (as in determining the competency of students to go on to the next level, of teachers to teach effectively, and of administrations to manage acceptable outcomes), and yet learners are posting work and reflections and assessments to various Web locations that are, in many cases, easily discoverable through a simple Google search. How do we explain those students who seem disengaged and distracted and are underperforming in the classroom, but who may be producing highly creative, literate, and impressively intellectual content that can be easily viewed on the Web? What is the difference between the test we give students in formal learning settings, versus the work portfolios that we discover in the informal learning spaces on the Web?

Social networks can tell a lot about a person. There is justifiable concern over what risks social networks may pose. The friends people select, the groups where an individual is most welcomed and participates—each interaction can provide insight into a personal profile. Indeed, investigations in the wake of campus or school rampages will often focus on the online affinity groups of the perpetrators. Sophisticated data collection goes on around most individuals' participation in online communities. While we may be losing or voluntarily surrendering aspects of our privacy for the convenience of participating in digital communities, there is also ample evidence that the informal learning gained from social interactions and peer-mediated learning is substantial. And the more diverse, global, and heterogeneous a set of networks that one participates in, the more learning that occurs (Boyd & Ellison, 2007).

A Semantic Web

One problem with today's increasingly short cycles of technological convergence is the lack of time we have to make the necessary intellectual and legal adjustments to the introduction of transforming technologies. The socio-technological trends of social production and social networking are viewed in the context of the World Wide Web as we've watched it evolve over its first 5,000 days. And yet, just as we seem to be accepting the transformational effect of a "read/write" Web, we are about to see a complete transformation of the World Wide Web itself.

If social production can be summarized as radically redistributing the powers of production and knowledge creation and generating a model for learning *to do*, and social networking is a model for learning *to be*, then a semantic Web will become the model for learning *to know* in the next innovation phase of the Internet. A semantic Web, the protocols of which are just emerging, will fundamentally change our understanding of the potential of the Internet to create and deliver new knowledge. A semantic Web will dramatically transform our relationship to new knowledge, our ability to use new knowledge for purposes of creativity, and our definition of what it means to be educated.

A semantic Web will quantitatively and qualitatively improve search, collaboration, and publishing. Don't think of this next generation of information and knowledge management as a linear progression of change. Indeed, a semantic Web will be unlike anything we have experienced before. It will be comparable to the difference between our experience before the emergence of the Web and e-mail and cell phones with text messaging capabilities and our experience after all of these things became intricately woven into our daily lives—so much so that we are often highly stressed when we can't access the Internet, can't get to our e-mail, or lose our cell phone.

How will a semantic Web differ from the Web we've come to depend on? To create a semantic Web,

information itself will be tagged, described, and defined so that each bit of information coursing the Web will carry its own DNA. So we now come upon a dawning era of information bits that will be organized, interpreted, and distributed in ways that give implicit and explicit meaning to discourses from humans to humans, and, yes, for those who wonder about brave new worlds, from machines to machines, and from machines to humans in ubiquitous digital domains.

Instead of pages sharing information through hyperlinking, each bit of content itself will share information and stretch our capacity to make meaning out of the mountains of data that otherwise cause us to experience information overload. Search tools that mimic natural language patterns, offering more reliable and specific contextual modes, will replace today's search engines. We are all familiar with the limitations of current-generation search engines. Type some keyword phrases in Google and you're lucky if you don't have thousands of returns to browse through. Of course, Google's search technology has generally been good enough to give us what we want within the first 20 or so returns. But search will take on a whole new dynamic if our queries have context and semantic references added to them. Beyond the semantic Web we can foresee the vague outlines of an intelligent Web.

There are some pretty interesting examples of what it will mean to give information units a digital DNA. Photosynth is a software program that captures and reconstructs spaces in the social environment of the Web and registers collective memories created by hundreds or thousands of contributing photostreams to give us a highly contextualized view of what our world looks like. This technology was put on display by CNN during the Obama inauguration ceremony, gathering in thousands of digital pictures from cell phones and single-lens reflex, or SLR, cameras to re-create a panoramic view from one end of the Washington Mall to the other, from thousands of feet away to close enough to "touch" without any loss of resolution. Using principles of tagging and spatial registration, a model emerges that is greater than the sum of its parts. Photosynth is a potent mixture of two independent breakthroughs: the ability to reconstruct a scene or an object from a bunch of two-dimensional photographs, and the technology to bring that experience to virtually anyone over the Internet.

Using techniques from the field of computer vision, Photosynth examines images for similarities to one another and uses that information to estimate the shape of the subject and the vantage point each photo was taken from. With this information, we re-create the space and use it as a canvas to display and navigate through the photos.

The Photosynth project is a prime example of the potential of the next generation of semantic Web technologies to transform our understanding and creation of knowledge. All of this amazing, jaw-dropping imagery is an example of the Web we will take for granted in three to five years. When each photo pixel or bit (a single unit of data) has been tagged and coded with information about the information, a truly intelligent Web, with powers of reasoning emerging from its DNA-like features, will make it seem as if we've gone from the Stone Age to the Industrial Age in a single leap.

The infrastructure to power a semantic Web is already here. Not only are the bits of infrastructure now in place, but we are also seeing startups, research organizations, and enterprises working hard to deliver valuable new applications on top of this sophisticated set of technologies. A semantic Web means many things to different people, because it has lots of pieces. To some, a semantic Web is the web of data, where information is represented in specific technical ways. Others think that a semantic Web is about Web services—applications that bring new services, such as events automatically matched up to a calendar, or connections to people (friends of a friend) even though we use different platforms or applications. For many others, it is about artificial intelligence—computer programs solving complex optimization problems that are beyond the reach of the human mind.

Educators will redefine this potential in terms of student value—whatever the semantic Web is, it needs to have simple and tangible applications for learning and teaching. Much is possible and much can be imagined. If having "Google in your pocket" allows everyone instant access to all knowledge, anytime, anywhere, what is possible when the Web itself possesses a contextual instinct, a natural language interface, and a power of reasoning that is the broad outline of a semantic Web? One thing is certain. Learning *to know* will never be the same.

Media Grids

Think of media grids as three-dimensional representations of space using computing power and the Internet. One of the first applications to be introduced to early computer adopters was a simple video game called Pong, an electronic version of air hockey. Pong's success spawned the video game industry (Miller, 2005). Today's generation of video games simulates highly complex and realistic experiences. The technology is evolving rapidly for creating multidimensional models of digital simulations of reality.

We see it in the popular online role-playing game World of Warcraft, which is revolutionizing online games through complex team strategies and sophisticated graphics. Virtual worlds such as Second Life, Google Lively, There, and Entropia Universe let you create avatars, buildings, and even virtual classrooms and business settings. With Google Earth and Microsoft's Virtual Earth 3-D, you can transcend the map layout and zoom into satellite-mapped locations around the world. All these developments have something in common and point in one direction. Within a very short period, the Internet and the vast wealth of information and services on it will look different, slicker, more realistic, and more interactive and social than anything we experience today through the Web browser.

What do media grids mean for learning? By now the debate about the effect of video immersion on the minds and lives of our students has formed its hard and fast battle lines. There are those who are convinced that video games are the ruination of young minds. Certainly, the social benefits derived from the popular video game Grand Theft Auto are hard to imagine. And so many other video games present themselves simply as opportunities for gratuitous violence and mayhem, even if only of the virtual sort. What could be the benefit of anything in the gaming genre for learning?

Beneath the pop culture veneer of today's shoot-'em-up video games, some trends are emerging that have the potential to revolutionize learning and virtual experience in the near future. Gaming embeds all of the attributes of Howard Gardner's (2007) five minds for the future: the disciplined mind, the synthesizing mind, the creative mind, the respectful mind, and the ethical mind. Games can do something else, as well. Game scenarios can branch, so content is no longer confined to linear structures, as so many learning experiences are in our traditional formal educational settings. If, as evidence shows, experiential learning engages the mind and teaches learners *to do* and *to be* more effectively than the linear application of content so frequently used today, games with an educational orientation can become powerful tools in and out of the formal classroom. We're starting to see real development in this area.

Although games have become popular among the young netizens, many educators are less aware of the emergence of virtual worlds that replicate our social landscapes through 3-D experiences. Second Life is such a 3-D social landscape, with all of the elements found in the real world, including an active economy based on a real, exchangeable currency called Linden dollars. This thriving economy is made up of hucksters and craftspeople who buy and sell virtual real estate, rent out retail outlets or trade show booths, create and sell items of clothing or furniture or floor plans—virtually any item of value, all referred to as "sims."

This virtual world of the future will work differently from our current Web experiences in flat, two-dimensional spaces. In a sense, virtual worlds will become not just a portal into various media,

entertainment, and communications services but also a window into a potentially richer real life. Virtual worlds will become the place where we can conveniently engage in familiar real-world activities such as family reunions and shopping trips with friends or in thrilling, only-in-cyberspace adventures.

Above all, virtual worlds hold the potential to transform social interaction online. In contrast to the Web, where there's almost no assumption of a human heartbeat behind the Web page, virtual worlds are inherently social settings. Social activity dominates what people do online today. When you approach an avatar in Second Life, you know there's a real person on the other end. Eventually, virtual worlds may prove to be much more than the fad some folks think they are. World of Warcraft and Second Life may be all the rage now, but they still touch relatively few people's lives, in no small part because they're primitive and awkward to use. But that situation is about to change. And when the virtual world achieves a level of sophistication that makes virtual social interactions nearly indistinguishable from real social interactions, our world and our system of education will be transformed. This will happen in a matter of a few years.

The New Zoo of Nonlinear Learning

Physics proved to be the mother science of the 20th century. All the modern conveniences we take for granted can be traced back, in large measure, to breakthroughs in the general science of physics. Biology may prove to be the mother science of the 21st century. Biology has been making rapid advances in helping us understand the world of the metaphysical so long ago contemplated by Plato, Aristotle, and their descendant philosophers. And out of this understanding comes a new code that we are just learning to work with: the four letters representing the base elements of deoxyribonucleic acid (DNA)—A, C, T, and G. The combination of these base elements in pairs has a singular purpose in nature—to carry information within each cell and to instruct all of the processes arising out of the interaction of cells in complex living organisms. What we couldn't know at the dawn of the 20th century we had to account for through a Cartesian duality of mind and body; today we stand much nearer to a not-so-distant horizon of limitless possibilities through the language derived from the code of A, C, T, and G.

This new science will change everything about our understanding of knowledge creation. As physicist and author Freeman Dyson (2005) states, the Darwinian interlude is over—3 billion years of a process of intense competitive natural selection that gave rise to micro-organisms that replicated their unique gene sets so that they formed the first species, and over the millennia, added and subtracted to the tree of life through species births and extinctions. In the beginning, the soup that made up a microbial sea used a process of horizontal gene transfer (Woese, 2004). This process allowed evolution to be a communal affair. But it was an inefficient process, and the rise of species that no longer shared all genes allowed far more complex organisms to rise and fall throughout the Darwinian epoch.

With the code of life in hand, Dyson speculates that the post-Darwinian era represents a return to a communal form of gene sharing. Humans will achieve the power to create new species at will and transfer genes horizontally as in the pre-Darwinian period. In Dyson's mind, cultural evolution is better than natural selection. "Designing genomes will be a new art form, as creative as painting or sculpture" (2005).

And what role will learning and knowledge play in this revolutionary new world of biotechnology? Our questions will only get more complicated and our answers less certain if we are to survive. But it is too late to wish the progress of science and knowledge would not put such a burden on our systems of education and curriculum design. We can rail against the challenge to God and nature that such science suggests, but technology once introduced into the world never completely disappears. In her 1997 book, author Janine M. Benyus introduces the concept of biomimicry. She writes, "Our planet-mates (plants, animals and microbes) have been patiently perfecting their wares for more than 3.8 billion years … turning rock and sea into a life-friendly home. What better models could there be?" (p. 8). Her book describes examples of

people who are studying nature's achievements, including photosynthesis, natural selection, and self-sustaining ecosystems, among others. Benyus then explains how those researchers use the inspirations found in nature to emulate "life's genius" for the purpose of improving manufacturing processes, creating new medicines, changing the way people grow food, or harnessing energy.

Although all of this may sound strangely futuristic, the seeds of these technologies are here today. Researchers and practitioners are performing experiments that send shivers down the spines of Luddites and futurists alike.

What is the role of education in the 21st century? Can we afford to continue with a system that remains grounded in the linear learning structures and content of bygone eras? Should we still be looking at disciplines as separate, distinct, and unassailable by anyone outside the walled gardens of the academy? The new zoo enabled by biology, a new mother science for a new era of nonlinear learning, should give all those concerned with the direction of learning and teaching pause for thought. Deep thought, and even deeper questions.

From Cathedrals to Bazaars

As educators, we have always placed confidence in the order and scope of the learning process, and striven for certainty of outcomes. We seek a proverbial walled garden of learning in which we can teach and guide and instruct. But our walled gardens are becoming less and less effective at stimulating the messy, nonlinear, highly organic process of learning—at least the kind of learning that seems to be at the core of what it takes to be a successful citizen of the 21st century. The assault on our traditional notions of learning is not some evil force, some cultural decay that has infected the minds and bodies of students of the 21st century. We can raise a cry of angst for the downside view and what it does to our more compact traditional notions of teaching, but we miss a great opportunity if we don't dig deeper into the nature of our own understandings and begin our own shift toward a more practical view of this march of technological progress and the social adaptations it ignites.

As educators, we have a responsibility and a role to play in determining how we respond to the technology trends and social adaptations underway. At the very least, we will have to address not just what we teach our students, but how they (and we) learn. We will have to let the social adaptations of technology inform us on revising best practices to meet the challenges of a less-than-certain outcome of our formal educational institutions and processes.

What we thought we knew about learning and teaching, and the cathedral-like, elegant, top-down, complex systems we designed to support formal processes of learning and teaching, just may not be the relevant model. We may have to reimagine a model that will behave more organically; we may have to develop into a world-class system at a far more rapid pace. The model may not be that which conjures up a cathedral, carefully crafted by wizards and experts working in quiet isolation, but that of a great babbling bazaar that, as if by magic, presents a coherent and stable system that meets the challenges of a transformational time in our understanding of learning and teaching.

Table of Contents

Register

Tags:

(Log in or register for ASCD EDge (free) to add a tag.)

YOUR COMMENTS

☆☆☆☆☆ (0 Ratings) Log in to save to your profile!

(Log in or register for ASCD EDge (free) to add a comment.)

The following are comments from our users. This is not content created by ASCD