

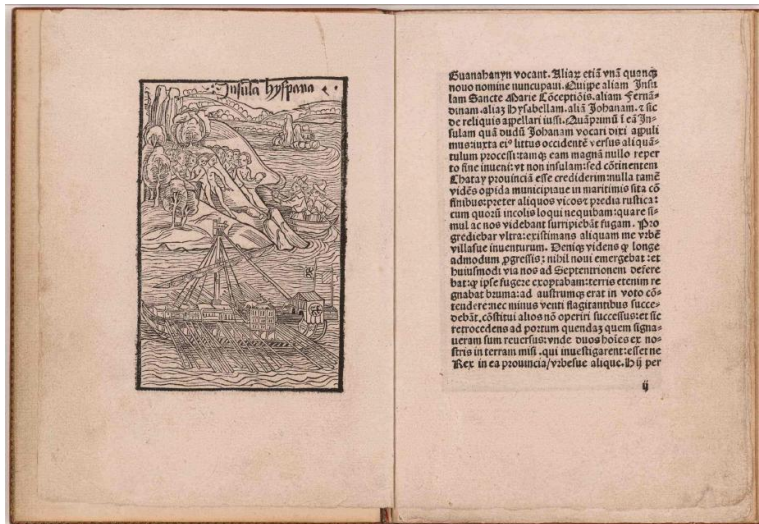
Technology in Education: Renaissance or Middle Ages?

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A decade ago, at the dawn of the new century, I wrote a short article describing what I called Renaissance 2000 – the birth of a new era of creativity that would lead to a period of educational enlightenment. My argument was that, just as the rise of the mass-produced book helped usher in the original Renaissance, the rapid growth of ubiquitous personal computing, coupled with access to broadband communication, would produce similar effects today.

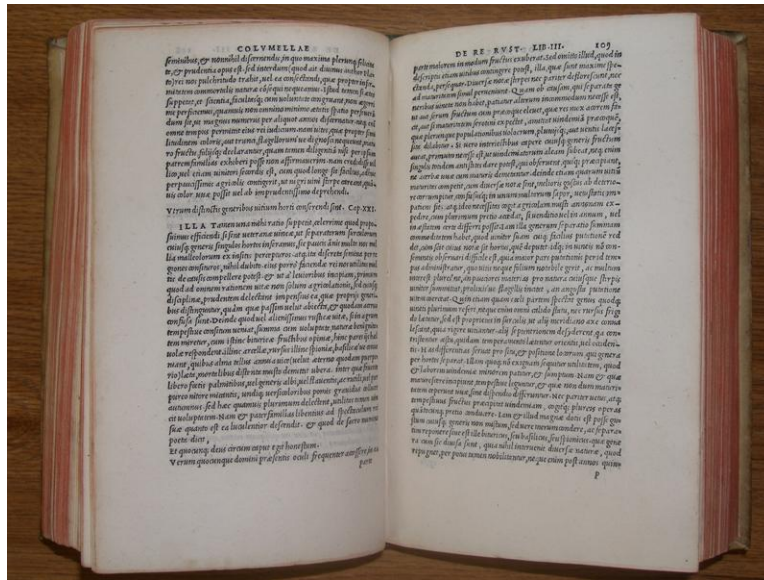
For example, the discovery of the new world by Columbus differed from that of the Nordic explorers because when Columbus returned to Europe, he published his findings in a book that achieved wide circulation.



Pages from Columbus' book on the discovery of the New World, 1493.

This short document, published in 1493 (<http://www.wdl.org/en/item/2828/>), not only inspired other explorers, it opened the minds of people throughout the land to the idea that there were new frontiers to explore. These conditions did not exist in the time of Leif Erikson. Tales of exploration at that time were propagated through oral legends – stories that became more fanciful with each telling until they reached the point that the distinction between fact and fiction had been completely blurred. It was the capture of the experience through the extrasomatic memory of print that made Columbus' exploits inspirational. As others have said, it was the press that discovered America. (see, for example, Paul Levinson, *The Soft Edge: A Natural History and Future of the Information Revolution*, Routledge, 1997.)

While other factors contributed to the flowering of the Renaissance, the rise of the mass-produced book remains one of the key elements of its success. Critical to this was the development of modern book formats that made books affordable, making it possible to spread ideas far and wide. The credit here belongs to Aldus Manutius, whose italic typeface was quite legible at small sizes. He also is credited with translating and reprinting classics in the Italian of the day, making them accessible to a broader audience.



Pages from a book typeset by Aldus Manutius, 1531, showing his “italic” typeface

With this historical background, it was logical to look at today's personal computers and the rise of broadband communication to see parallels to the impact of the book five hundred years before. From this perspective, I proclaimed that we were at the dawn of not just a new century, but of a new era – a second Renaissance whose flowering of creativity and knowledge would transform everything it touched – including education. At the time I wrote the original article, smart phones did not exist. Broadband was not commonplace. Students did not, in general, enter classrooms with more technology than most people had in their homes a decade before. If anything, one would have expected (based on my assumptions) a tremendous transformation to have rippled across education – the incipient discovery, if you will, of a new world of learning, aided and triggered in part by the wondrous tools that in the span of a few short decades had transformed science fiction to everyday, commonplace, reality.

This view was not only naïve, it was very wrong. First, while computers became commonplace in the United States, true broadband did not. Yet, it was not the failure of broadband ubiquity that kept education from being transformed.

Consider the following headline that appeared in the Chicago Tribune in October, 2010:

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After years of banning hand-held devices, many high schools are conceding defeat, allowing them to be used as academic tools



Fremd High School seniors Julia Ostoich, from left, David Parzynski and Kayla Price use their cell phones to look for information about Illinois political races during a government class last week at the Palatine school. STACEY WESCOTT/TRIBUNE PHOTOS

Cell phones step up in class

The very tone of this headline is bizarre - "After years of banning hand-held devices, many high schools are conceding defeat, allowing them to be used as academic tools." In other words, after years of ignoring the powerful ways students access and share information, schools are finally allowing kids to move beyond the dry and brain-numbing experience of educational practices that have, until now, ignored the educational tools they use in everyday life.

If this was not so sad, it would be hysterical. And yet we need to look at this situation quite carefully. Just as technologies of all kinds are becoming more commonplace as tools for learning, the resistance against the kind of systemic change that these new tools allow is becoming stronger as well. Rather than finding a middle ground, the chasm between both sides seems to be widening, with our youth caught in that growing gap during a period where the need for a dynamic education has never been stronger.

For example, five years ago, the National Academies (<http://www.nap.edu/catalog/11463.html>) published a report – *Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future* – in which (among other things) the failure of schools to transform themselves was predicted to have a growing negative impact on the economy. The report went on to suggest concrete ways that this situation could be fixed. This amazing document,

authored by Nobel laureates and other thought leaders, was circulated as a call to action.

A few months ago, on the fifth anniversary of the original document, an update was published: *Rising Above the Gathering Storm, Revisited: Rapidly Approaching Category 5* (<http://www.nap.edu/catalog/12999.html>) in which the point was made that many of the recommendations in the original report had been taken to heart – in Europe and Asia, but not so much in the United States. During the intervening five years things have gotten progressively worse, not better. And yet, looking at the ways in which modern technologies have been adopted by schools in that time period, almost nothing has changed. The tools that do exist are often used to replicate those of the past – replacing blackboards with so-called “smart” boards, for example. Such technology adoption creates the illusion of change without touching any assumptions about the curriculum or pedagogy, and yet, according to the documents just mentioned, it is in these areas that the greatest changes are most required.

Why have things worked out this way?

Going back to history, the Renaissance grew out of the Middle Ages and was a transitional period leading to the Enlightenment. The feudal system did not go away overnight. Feudal lords held on tight to their domains and used every tool in their arsenal to repel the tide of people eager to craft their own place in the world rather than live under the yoke of those who would keep them under control.

And so it is with education today. Today's feudal lords populate federal and state offices of education, with the support of sycophants eager for the crumbs left to them for their efforts. Instead of taxing the serfs into effective slavery, we test the students into submission. Instead of burning down villages who fail to pay enough taxes, we close “failed” schools and place the blame on the teachers and staff, when it is often the very structure of the educational environment that may be to blame.

Against this backdrop, the growth of personal learning technologies is properly seen as a threat. While the stated goal of education is to reach every learner, it takes only a slightly deeper look to see that this is not the national objective at all. Consider a national educational program called “Race to the Top.” A race only has one winner. The very language of this program is exclusionary – it starts with the assumption that, in order for there to be a winner, there must be losers. We live in a time when an educated populace is more important than ever, yet 25% of our young people drop out of high school – condemning them to a life of minimum-wage earnings, assuming that they can get jobs at all. A study on the economic costs of failure was published in 2009 by the McKinsey Group: *The Economic Impact of the*

Achievement Gap in America's Schools (www.mckinsey.com/clientservice/socialsector/). As stated in the report, "A high school dropout is five to eight times more likely to be incarcerated than a college graduate." and, if that was not enough, this report shows that "These educational gaps impose on the United States the economic equivalent of a permanent national recession."

To be fair, the elimination of educational feudalism is difficult. For one thing, it is so deeply entrenched that it takes concerted and prolonged effort to change our way of thinking. For example, teachers who complain that smart phones make it too easy for kids to cheat have failed to grasp that the solution may be to ask students questions for which Google is not the answer. While this is easy to say, it is hard to do – it requires a deep rethinking not only of what we teach, but of how we teach it.

Yet, without this level of concerted effort, our new Renaissance may never gain enough traction to usher in a new Enlightenment. This would be a tragedy of immense proportions.

We have the tools we need to transform education. Feudal textbooks are more expensive than Renaissance computers, and the savings could be used to provide sustained staff development needed to usher in the new era. And, just as in Florence 500 years ago, some schools have transformed their practice, and their amazing success provides added impetus for changing the system.

Even so, I no longer suffer under the illusion that the transformation will happen of its own accord. Vocal change agents are needed. We must rise up against the status quo, and especially against the tide of those who agree that our educational system is challenged, but whose solutions are to implement even more of the flawed ideas that led to our current situation in the first place.

I suggest we start by looking at our own ways of learning something new. Most people I know start their learning process by rounding up "the usual suspects," Google, Wikipedia, etc. Next, they may go to Facebook and post a request for help with their friends, or use their own mailing list to e-mail a request for guidance. Within a short time, most of us have uncovered so many resources that our task then is filtering them to see which nuggets are likely to be the most valuable. From here, discussions with peers let us test our growing knowledge, and learning becomes the peer-based social enterprise that was celebrated by Vygotsky and other great pedagogical thinkers.

What is most interesting to me about this approach is how natural it has become to many

educators. Yet, the very tools and techniques they use in their own lives are often blocked in their schools. Take Wikipedia for example. Like all reference works, the quality of the articles is variable. An advantage of Wikipedia is that errors can be found and corrected by the users themselves. As a result, most articles relating to academic subjects are not only accurate, but are generally quite up to date. That said, there are teachers who are reluctant to let their students have free school-based access to this tool. There is a wonderful compromise, however. Wikipedia allows users to create a collection of articles and assemble them into a “book” that can be saved as a pdf file and downloaded for free. Teachers can then make their own Wikipedia “readings” for students using only those materials the teacher has vetted. This approach addresses the concerns of those educators who remain skeptical of the quality of Wikipedia entries.

Curiosity is a key element of learning. Young children love to look at bugs and rocks and other things they can see close to the ground. A child with a magnifying glass can happily spend hours exploring a forest floor, marveling at the wonders of nature. This kind of hands-on exploration is a natural part of growing up, and takes place years before formal school starts. In some sense, today's smart phones are like that magnifying glass, only the artifacts under exploration are more abstract – ideas, conversations, etc. Like the magnifying glass, the smart phone is personal – more so than a notebook computer. It is also a powerful tool for education, if only we have the courage to let students benefit from the technologies our generation invented for them. Only then will feudalism fade away, revealing the flowering of the new Renaissance that can lead to a new era of enlightenment.

About the author:

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David is the Founder and Director of Global Operations for the Thornburg Center for Space Exploration. He is an award-winning futurist, author and consultant whose clients range across the public and private sector throughout the planet.

He is engaged in helping a new generation of students and their teachers infuse STEM skills through the mechanism of inquiry-driven project-based learning.

His educational philosophy is based on the idea that students learn best when they are constructors of their own knowledge. He also believes that students who are taught in ways that honor their learning styles and dominant intelligences retain the native engagement with learning with which they entered school. A central theme of his work is that we must prepare students for their future, not for our past.

He is also the inventor of the Educational Holodeck™, a technology that is transforming the face of education in several schools.

Please contact Dr. Thornburg if you are interested in presentations and/or workshops or want to know more about the Educational Holodeck™ (dthornburg@aol.com).