BOOK REVIEW
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Rethinking Education in The Age of Technology: The Digital Revolution and Schooling in America, by Allan Collins and Richard Halverson

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> "*... in today's world, one of accelerating change, in which many skills become obsolete nearly as fast as they are learned, both schooling and learning are under siege.*"
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> —Allan Collins & Richard Halverson

INTRODUCTION

Book reviews are generally about a newly (if not recently) released work. Such currency of publication presumably represents what is better in the form of what's trending, cutting edge, or around the corner (about to be birthed as the next phase of the new and, subsequently, better) and we hope in the grand scheme of things that matter to us. However, every now and then, a work comes along that captures our imagination, and then we place it on the bookshelf of progressive, revolutionary, and critical ideas to gather dust as it germinates into a classic. Over time, such a work grows in importance due to the timeless stimulating questions raise, which are predicated upon arguments that confront the status quo and serve as fertile ground for trending predictions (however, shortsighted those turn out to be in the long run). Allan Collins and Richard Halverson, in hindsight, have such a book written just 5 years after the Web 2.0 tools revolution and in the explosive yet nascent midst of such web-based tools proliferation.

This thoughtful work, with all its inherent flaws and optimistic assumptions, portends an envisioned future, which skeptics despised and

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enthusiasts oversold, that has not come to fruition as a result of many variances known and yet to be known. It is time nonetheless to knock the dust off this seminal work and take a look anew at the ideas it purports as *seeds* of the digital revolution as well as take stock of progress made in these early years of the current lifelong era of education to which we have shifted and are now experiencing. As such, this book review is most warranted.

CONTENT

Part 1: Technology Enthusiasts Versus Technology Skeptics

This insightful book opens with "How Education Is Changing" (Chapter 1), which showcases the coauthors' big-picture view of the "current" state of education premised upon their central argument that there are "deep incompatibilities between the demands of the new technologies and the traditional school" (p. 6). Technology is making life more difficult and challenging for far too many teachers even today since it demands skills of teachers that are lacking or inadequately presented through professional development trainings and has shifted the locus of expertise and control away from teachers. As a result, many teachers feel uneasy that their authority and roles are compromised since they are no longer viewed as the experts (or "sages on the stage") in the classroom and struggle to adapt to the roles thrust upon them as facilitators (and "guides on the side"). In fact, as the coauthors assert, the "lockstep model" (p. 6) of schools fails to harness the power of technology to individualize and customize learning through adaptive web-based programs and, subsequently, continue to keep technology applications at the periphery of teachers' core academic and instructional practices. Technology's place in the pantheon of the school is too often the computer lab or media center. Teachers then must prioritize technology integration within the scope of pedagogical prowess and shift the emphasis, beyond lip service, from teaching to learning through meaningful practice. "Schools," as the coauthors point out, "ignore computers at their peril" (p. 6).

However, the picture painted by technology (back then as now) is not all favorable. The coauthors lament that technology, which has moved out of schools into public library, workplaces, learning centers, and homes, has the power to "widening economic gap" (p. 7) and adversely affect access. Paradoxically, as the coauthors later assert, "what technology gives, it can also take away" (p. 12), that is, its strength can serve as a perceived weakness. Inherently, then, the first part (Chapters 2 and 3) of the book focuses on the tension—a divide that is still real and yet to be bridged—between the technological enthusiasts and the technological skeptical as well as correspondingly between revolutionary and conventional venues for learning (not teaching).

Technology enthusiasts, who favor a constructive approach to learning, proffer two arguments for technology integration in schools; these are (a) the world is constant changing due to technological advances and students must be prepared for these changes using the requisite technologies, and (b) technology offers the best tools for educating all learners, and so it is incumbent on schools to tap these tools' capabilities to shift learning and reshape schooling. Schools, in the lifelong era of education, should be a place for learner control and choice over customized, interactive, scaffolded, and reflective learning inclusive of games and simulation, multimedia usage and publication. Today, it is commonplace in the educational milieu to hear "who is doing the work is doing the learning." Technology thus engages and motivates students through immersive, customized, and adaptive learning that can address all learners' needs, especially those who struggle in schools from traditional teaching. Technology enthusiasts argue that personalized learning is best provided with the support of computers, given that differentiation is hampered by overburden teachers, and should be included in design principles of instruction for school-based con-

tent as schools move (though slowly it is) away from "just-in-case" and "everything-at-once" learning.

Though technology has changed, and is changing, how we think and make sense of the world around us through "just-in-time learning" capabilities tied to real-life application, research (such as Cuban, 2001) has been inconclusive at best about technology's impact on positively improving high-stake testing scores and academic achievement in schools. Perhaps the jury is still out on that. The challenge for technology enthusiasts, and as a technology integration specialist who has experienced working with digital immigrant teachers, is how best to build technology into the core practices of school—and by extension, school system, which "stubbornly resist changes to its core practices" (p. 30). Evidently, there is good reason to approach the issue of change with some healthy level of skepticism. Chapter 3 subsequently focuses on this issue, and offers several reasons, why technology is resisted and change in school is slow, including citing the fact, from Cuban's (2001) research, that "computers have had little effect on teaching and learning in schools" (p. 32). Furthermore, teachers may lack the professional development (PD) training or will to change their core instructional practices to integrate technology, and even when adequate PDs and monitoring support is available, "most teachers know that once in their classrooms, they can teach as they please" (p. 34). Sadly, this unsaid reality is too often the case.

Far too frequently, we see the propensity of teaching as a "conservative practice" (p. 36) that perceives changes as challenges to teachers' sensibilities of control and expertise as well as respect and authority. Teachers, as a collective, do not like to test out untried ideas, and computers seem risky to most digital immigrant teachers. Traditional-minded teachers need to buy into the belief that "education should be about students constructing their own understanding [and knowledge] using computer tools" (p. 43). This is where a mission-oriented visionary school leader can communicate the school's vision, reshape the school's purpose and culture, and persuade the faculty to value a "student first philosophy." Likewise, a maverick teacher, who is integrating technology with proven success, can lead by example, demonstrating that innovating with technology is not a cocurricular *boutique program*. This exemplification can provide evidence to convince colleagues to join the risk-taking technologically innovative fold. Visionary leadership is thus key to a progressive, innovative, and collaborative school culture.

Nonetheless, in the name of stability and propagation of the "assimilation of cultural knowledge" (p. 47), schools have developed three strategic "defense mechanisms" to deflect and resist "innovative technologies without influencing the traditions of teaching and learning: condemning, co-opting, and marginalizing" (p. 36). This analysis of how, when, and why schools refuse to shift to meet new cultural and student needs is by far the most valuable section of this book. That aside, technology has the potential to truly make schools student-centered and learning customized and more engaging. However, embracing this technological advantage is challenging since most schools have a well-documented history littered with examples of "resistant to change, even when the change will clearly benefit students' learning" (p. 30). Hence, the coauthors' argument that there is a manifest need to rethink schooling in light of advancing technologies aim at innovative instructional practices with the intent of benefiting learning, inside and outside the walls of the school is well merited.

Part 2: From Apprenticeship to Universal Schooling to Lifelong Learning

As the above implied, the history of schooling is thus the history of school reform. Chapter 4 details "The Development of American Schooling" by expounding the transformation from the Industrial Revolution that led to the

development of universal schooling to the Knowledge Revolution, which has created the new era of lifelong learning. It parallels the transferring of responsibility for education away from the family to the state and now back to the individual and parents. However, for those of us who prefer a more practical, current, and forward-thinking application of historical changes, Chapter 5 explores "The Seeds of a New System of Education" in the form of the explosive growth in home-schooling, workplace learning, distance and adult education, learning centers, gaming and computer-based learning software, educational television and videos, technical certifications, and Internet cafes, not to mention the popularity of YouTube videos and social media, social networking, social bookmarking, and other Web 2.0 applications not addressed by the coauthors; all of which has gradually eroded the identification of learning with schooling.

These *seeds*, which are not exempt from pejorative attitudes by school leaders and teachers (as gaming initially typified), provide new settings for learning (all outside of the classroom) while mitigating many of the problems faced by today's schools. Potentially, these "seeds" of innovations, which "extend learning throughout life and over many venues" (p. 89), comprise the technological fragments of a new equitable and coherent educational system. At this juncture, this is more conjecture than reality given we have not seen this emerging system being realized in the intervening years since publication, but the coauthors advised that technological visionaries (like a Horace Mann or a new Thomas Jefferson) are needed to consolidate, reshape, and systematically interlock these technological pieces. Additionally, strong leadership from innovative educators are needed to ensure that any new emergent system will embody society's critical goals for education, which include presumably access to equity and protection of social cohesion (these are heavily guarded intangibles of education's purpose for the coauthors).

In the big picture view of education, technical certifications offered by companies and technical societies are of particular interest since they (a) provide alternatives to technical degrees for students who struggle with academic content or excel at technical skills, (b) are more meaningful to potential employers than diplomas, given they are more precise in specifying what a person can do, and (c) break the monopolies that schools and college once held as the sole arbiters capable of issuing degrees and certificates. In effect, as the shift in validating certificates embody, the coauthors advance the notion that learning does not necessarily commence with kindergarten and end with a high school or college diploma. More importantly, schools need to design a coherent lifelong learning system. The coauthors, justifiably, advocate for a new vision of education that aims toward strategies that provide access to the new educational resources for everyone in society and gives people the motivation to take advantage of these resources.

Part 3: The Three Eras of Education—Gains and Losses

To reiterate, as described in "The Three Eras of Education" of Chapter 6, we are in the lifelong learning era of education, which was preceded by the apprenticeship and universal schooling eras. This current era is said to be reminiscent of the bygone apprenticeship era in that the lifelong learning era represents a return of the responsibility to educate back to the locus of individual and parents, and away from the state. This is embodied by home schooling, distance education, learning centers, technological certifications, and student-centered classrooms that provide students with voice and choice about what students value in their learning. High-stakes testing and accountability based on instructional standards, remnants from the universal schooling era now firmly entrenched into our current school systems, are inherently counterproductive to students' choices and antithetical to the

customization of learning. Nonetheless, in the lifelong learning era, core curricular standards purportedly serve as a "conservative check on rampant customization" (p. 94) while promoting the 21st century educational goal of "learning how to learn and learning how to find useful resources" (p. 95) through generic competencies (commonly referred to as 21st century skills, which are at the heart of the Common Core State Standards) of problem-solving, communication via a variety of media, and interpersonal skills.

Chapter 7 focuses on "What May Be Lost and What May Be Gained" from any revolution in education or new emergent educational system, which "will alter not just the lives of students but all of our modern society" (p. 105). In the interim, from the perspective of the technological skeptics' camp, things feared include (a) the widening of the "digital divide" stemming from the technologizing and commercialization of education and (b) the "Balkanization of education" as students are steered along narrow paths based on their interests and choices as well as (c) the decline of liberal arts—as we have seen in many colleges in recent years in education, which prompted Zakaria (2015) to write a book in the latter's defense (the liberal education)—and (d) greater isolation which "could produce a loss of social skills and societal cohesion" (p. 107). On the contrary, from the point of view of the technological enthusiasts' camp (of which I am a fervent camper), technology offers the promise of deeper learning by more engaged and motivated students, resulting from the customization of learning and even ironically from the commercialization of education, as well as universal access to learning, and greater learning autonomy, that is, putting students in charge of their own learning. However, to alleviate the fears and maximize the gains of technology, a much broader view of education is desirous than educators have displayed—a salient point of these coauthors did not go unnoticed by this reviewer. The coauthors, to be succinct, suggest that schools need to think about how to integrate nonschool resources into learning environments, but also in supporting families in bringing these tools into their homes and in building such as wired learning centers in communities that reach those in need, if all people are to "become the best-educated people they can be" (p. 111).

Part 4: Rethinking Education in a Technological World

By the time you get to this part of the book, Chapter 8 on "How Schools Can Cope With the New Technologies," Chapter 9 with "What Does It All Mean?," and Chapter 10 with its call for "Rethinking Education in a Technological World," you may observe and criticize that the ideas—customization, interaction, and learner control, for example—are becoming repetitious (and they are!) but not redundant given the relevant call-to-action subheadings at this phase of the coauthors' argument. For instance, we are reminded that:

> Schools must face the challenges of harnessing the power of learning technologies at the same time as the pendulum of educational policy is swinging away from creativity towards policies based on standardizing schooling and emphasizing the kinds of accountability practices that paralyze risk-taking. (p. 120)

The reality depicted, through these words published in 2009, is as accurate as if they were penned today. In other words, "learning will leave schooling behind" (p. 131) given the fast pace of advances in learning technologies as well as "leech critical learning resources, such as student motivation, attention, and resources, out of the educational system" (p. 131) if we choose to do nothing; that is the thrust of the coauthors' premise. Every educational era needed timely and innovative leadership; the lifelong learning era is no exception. Are you a visionary leader or a maverick teacher? This is the time for technological visionaries, integration specialists, instructional designers and digital leaders to act. We need to rethink education, as the coauthors espoused, not in isola-

tion but within the wider context and broader scope represented by the interplay of society, education, and learning.

As the coauthors noted, "Simply inserting technology into classrooms and schools without considering how the contexts for learning and teachers lack of understanding of 21st century skills needs to change will likely fail" (p. 140) as we have seen from inadequate PDs or unsupported teachers. Forward-thinking educators need to rethink education, as the coauthors challenged us toward the ending of the book, by continuously asking: What type of skills and habits of mind are required for adaptive thinking and living in an information-rich world? Yes, without being overly critical, the key ideas and main points are reiterated time and again, à la spiraling curriculum or scaffolded lesson. Thereby, such reiteration supports the hopeful message in a more impactful way, that is emphasizing the need to embrace technology's capacity inside the classroom and role in creating coherence out of the seemingly incoherent educational pieces—some 7 years after publication of this must-read (or, better yet, "must reread") groundbreaking work.

CONCLUSION

Though Collins and Halverson wrote their forward-thinking work—Book 9 of the Technology, Education-Connections, the Tec Series—some 7-plus years ago, it is as relevant and applicable for educators and schools today as it was when first released as a critique of schooling and call to action for visionary (yet necessary) educational changes. Technology is moving and evolving at lightning speed but changes within schools as educational milieus lag behind at what seems like horse-and-buggy pace. Technology is ubiquitous and its role in our lives is ever present (in our hands, pockets, and purses) and ever-increasing. So, why does technology usage in schooling reflect a disproportionate reality? Why is it restricted by acceptable use policies and administrative wherewithal? Why is the Internet with its open access to resources still a fearful tool for far too many teachers to risk incorporating/integrating into classroom lessons/instruction and, subsequently, plays second fiddle in the lives of students in far too many schools some almost 8 years after this breakthrough book affirms that the "seeds" for a new education systems have been sowed.

The second educational revolution has begun; the digital revolution by all indication is underway. Now is as good as any time (even if it is 2 years shy of a decade since Collins and Halverson first requested for us) to rethink education, if we are to better support students' needs and interests to adequately prepare them with 21st century skills for navigating the world—now and in the future! That is the timeless message of this important work. It is well worth the time (again) to take a (second) look at this book, with fresh lens and the benefit of the intervening years since its publication, to assess our progress in general terms and reiterate the call for greater digital risk-taking and technology integration within schools and school systems.

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