

THE ROAD NOT TAKEN: THE DIVERGENCE OF CORPORATE AND ACADEMIC WEB INSTRUCTION

Robert Ubell

NYU Polytechnic Institute

ABSTRACT

Although corporate e-learning and academic online education have evolved along different paths, each reaches approximately 25% of its respective market. Because they have different philosophies and methods, the two fields may never completely merge, yet each may learn from the other.

KEYWORDS

E-learning, Online Learning, Training, Education, Cost Benefit, Collaboration

I. INTRODUCTION

In a Robert Frost poem, a traveler suddenly comes upon two roads diverging in a forest. Setting out one way, he regrets that he “could not travel both.” With a sigh, he doubts he will ever return to explore the road not taken [1]. If you take one path, you never know what might have happened if you went another way. Curiously, two recent pathways—corporate and academic web-enabled learning—each taking a separate road, give us an opportunity to retrace steps.

In the lab, scientists can manipulate variables, open lines of comparison, or establish controls. But in life, such experiments are quite rare. As it happens, computer-mediated learning is an unusual instance that allows us to compare parallel tracks *in vivo*. Both corporate and university web-based learning were launched at about the same time and continued separately, more or less independently for more than a decade. Both have turned out to be surprisingly successful. Uncannily, both corporate e-learning and academic online learning [2] have penetrated about a quarter of their markets [3, 4].

Why did they diverge? What accounts for corporate e-learning going off in one direction while higher education went in another?

II. WHAT'S THE DIFFERENCE?

Looking back, we can trace two clearly distinct histories and philosophies. Companies chose e-learning, a portfolio of Web-based self-learning modules for workers to complete on their own; universities adopted an altogether different style, largely mirroring the classroom in an instructor-led collaborative environment.

At first glance, academic online and corporate e-learning appear the same. Workers at companies and students at universities all face computer screens or hand-held devices. Even at the back end, they are pretty much alike. Courses are mounted on learning management systems (LMS) which facilitate registration, usage, and completion data, and, in universities, discussion boards, grade books, collaborative software, among other tools.

Few are aware that Web learning at companies and in schools is quite distinct. Once instruction begins, they clearly fall into separate camps. At companies, e-learning is highly mediated by technology, with

trainers disappearing entirely, replaced largely on monitors by instructional design elements, presented in text, multimedia, games, simulations and other displays. By contrast, in online courses at universities—often equally media rich—Instructors and students take their virtual seats online, interacting continuously with one another in text and real-time. Online, workers are on their own, while college students and faculty learn together [5]. When corporate learners face computer screens, they act autonomously, responding to commands or queries by themselves. But in an online college class, students and faculty interact, engaging in asynchronous or live conversations, often in teams [6].

Collaborative learning encourages knowledge creation through interaction, with participants actively sharing discoveries and experience. Based principally on theories proposed by early Soviet psychologist Lev Vygotsky, who believed that learning emerges naturally from social interaction [7], learners engage in common, mutually dependent tasks, leading to the creation of new or expanded knowledge. In higher education, teaming and peer-to-peer learning are now essential online practices. At universities, online collaboration reassembles traditional classroom relationships, placing students at the center of the stage with instructors as observers and commentators in the wings [6].

Although certain instructor-led virtual courses are offered in corporate settings [3], the lack of peer-to-peer instruction is especially surprising because teamwork is now so highly valued by industry as a productive force [8]. Faced with flatter management structures and a globally distributed workforce, employees now routinely communicate with one another virtually. These trends have so far not yet been widely translated into learning options in corporations.

III. ALONG THE CORPORATE ROAD TO E-LEARNING

Web-based learning in industry grows out of a long tradition of worker training, stretching back at least to the Second World War when it first became common practice. Moving from wartime factories to a peace economy, and especially following a period of rapid postwar technological advance, training became a requirement in virtually all industries. The introduction of computers further accelerated the demand. Today, US companies spend approximately \$135 billion on employee training [3].

In corporations, e-learning reaches back to programmed instruction, introduced in the last century to build a skilled workforce. While Ohio State University psychologist Sidney L. Pressey may have been the first to engineer a device to drill students by exploiting immediate feedback [9], it was not until Harvard behaviorist B.F. Skinner championed his “teaching machine” that programmed instruction really took off. Based largely on concepts in behavioral psychology, programmed instruction provides self-paced learning, reinforced along a carefully managed sequence of tasks leading to a set of predetermined goals. Skinner believed that learning constituted a cascade of stimulus-response events solidified by reinforcement. To achieve success and reduce error, he proposed that the learning process is best divided into “a very large number of very small steps and reinforcement must be contingent upon the accomplishment of each step [10].”

When computers invaded industry, training officers immediately grasped their possibilities as powerful instruments for learning. Modeled on programmed instruction, computer-based training, or CBT, provided linear, self-paced instruction, used mostly to teach standard processes, such as software programs [11]. Perfect for drill, practicing skills, and testing performance, CBT gave workers immediate feedback at the very moment when they acquire proficiency. Because they see results instantly, learners know right away whether they have absorbed the lesson. Crucially, CBT allow employees to return to problems they failed to master earlier, reworking them to increase their performance and, following Skinner, reinforcing their knowledge.

E-learning is much livelier than its rather plain CBT cousin. Exploiting some of the same instructional concepts, the old CBTs take on a new life on the Web—enhanced by simulations, video, games, and other multimedia applications. In this century, they morphed into e-learning modules.

E-learning crested on the great Internet wave that swept over industry, transforming everything in its wake—manufacturing, product development, supply chain, marketing, customer service and, not least,

the way training is delivered to a global workforce. With every phase of commerce captured in the Web, inevitably, corporate learning was snagged too. Responsible for the most profound shift in work since the industrial revolution, the Internet—at first accelerated by the dot-com boom—also fueled corporate learning.

In little over a decade, corporations moved rapidly from face-to-face instruction—as practically the only actor on the training stage—to sharing curriculum significantly with e-learning. Today, 23% of US corporate training is online [3], with US companies spending \$16.7 billion in 2009. In that year, companies invested \$31.1 billion in e-learning worldwide [12]. The change was largely due to the overwhelming economic advantage of Web-based instruction over conventional classroom teaching. Fierce economic forces have caused lavish country-club training parks to shut down, employee travel to exotic sites to be canceled and, tellingly for the bottom line, workers are now often kept at their desks or on the factory floor, participating in online learning, rather than in classrooms, to increase productivity. E-learning has obviously been instrumental in supporting these trends.

Web instruction has also helped propel worldwide corporate expansion. Self-learning modules are easily circulated to a globally scattered workforce at relatively low cost. As e-learning historian Paul Nicholson remarks, “E-learning in business and training [is] driven by notions of improved productivity and cost reduction, especially in an increasingly globalised business environment... [13].”

IV. THE PARALLEL ROAD TO ACADEMIC ONLINE LEARNING

University online education is descended chiefly from distance education, a line that goes back to the mid-nineteenth century when Isaac Pitman first taught shorthand in England through the mail. In the US, correspondence schools flourished at the turn of the century, especially after the University of Chicago launched “learning by correspondence” programs to thousands of students in the US and abroad [14]. Later, radio and television extended distance learning even further with the Open University in the UK being one of the first to exploit mass communication.

With computing, academic distance education finally came into its own. In the early nineteen sixties, PLATO (Programmed Logic for Automatic Teaching Operations), built at the University of Illinois at Champaign-Urbana, was remarkably ahead for its day both pedagogically and technically. It was the first generalized computer-assisted instruction system [15]. Some of today’s key academic online learning features had their early start with PLATO—forums, message boards, online testing, e-mail, chat, instant messaging, and multi-player games. Today, these early innovations are standard applications in university online education [16].

PLATO was succeeded by a string of software and communication advances, now housed on a handful of dominant LMSs—Blackboard, Sakai, Moodle, Epsilen. The ubiquity of the Internet not only made it possible for higher education to reach out to remote students and adult learners whose work and family lives prevented them from attending class on campus, but decisively allowed key features drawn from traditional classroom instruction to flourish. Virtual education made the vintage, one-on-one, faculty-student correspondence school model look quaint. It opened a space for one-to-many interactions and peer-to-peer learning, an unprecedented advance few had predicted [17]. Encouraged by the Alfred P. Sloan Foundation’s program in Asynchronous Learning Networks (ALN), and by other philanthropies and government funding, online learning today has broadly entered mainstream higher education and is penetrating elementary and high schools as well.

A new Sloan survey says that more than 4.6 million, or a quarter of the US higher education student population, were enrolled in at least one online course in the fall of 2008, an increase of 17% over the previous year, exceeding the much more modest overall US college growth rate of 1.2% [4]. Another report claims that some 1.25 million university students take all of their classes online [18].

The Web immediately revealed its obvious economic advantages for training, but its implications for higher education were not as apparent at the start. Recently, however, it has not gone unnoticed by chief financial officers at academic institutions. Faced with continually diminished resources, colleges and

universities have come to recognize the economic benefits institutions can achieve with virtual education. Online students do not rely on hugely expensive campus infrastructure. Studying at home or on the job, they don't swim in campus pools or park their cars in vast lots. Neither do they live in boutique-style dorms or attend classes in smartly up-to-date academic buildings that require deep pockets to build and maintain. What's more, in blended learning, when students shuffle their schedules to attend some classes on campus and others online, colleges benefit by doubling-up on the use of limited classroom space, freeing budgets for other pressing academic needs. While corporate and academic learning continue to run largely on separate tracks, the clear cost benefits of Web-based instruction are now recognized by both.

V. SEPARATE THEORETICAL PATHS

In advanced economies, corporate training emerges from a number of intertwined theories and traditions (see Table 1). Focusing on procedural, rather than conceptual knowledge, companies inevitably embraced behavioral approaches as an engine to build a skilled workforce.

Corporate e-Learning	Academic Online Learning
training	education
procedural learning	conceptual learning
behaviorism	constructivism
autonomous	collaborative

Table 1. Corporate and Academic Learning

Procedural knowledge means knowing how to manipulate a condition or how to perform a task; for example, how to run a science experiment or solve a mathematical equation. Procedural knowledge is also a measure of our skills, tasks we know how to complete, and techniques we know how to follow. Training is designed to give workers procedural knowledge in order for them to do their jobs effectively. Conceptual knowledge, on the other hand, refers to our ability to appreciate major parts in a system, understand complex relationships, or categorize elements logically. At their best, universities are expected to equip students to excel at conceptual knowledge.

Two major, opposing schools of thought have fought for ascendancy over the last century and are still in conflict today. Behaviorism [19], championed by B.F. Skinner and others, was largely adopted by corporations, while constructivism, initially led by John Dewey and other progressive educators, has emerged as the chief learning theory among online learning educators [20], even though it has not been widely adopted in traditional classrooms. Behaviorism claims that only objectively observable features of learning count, while constructivism sees learning as a process in which the learner actively builds knowledge.

Yet the behaviorist impulse is not confined to corporate training alone. It pervades nearly every school from suburban kindergarten to elite universities, with testing, objective scores, and outcomes-based instruction at every level. Today, no classroom is immune from being measured for achievement, performance, rank, completion, and so on. While elementary and high schools have been subject to a battery of assessments for years, higher education accreditors, who until recently have left colleges pretty much on their own to achieve their own aims, now demand that universities also produce measureable, evidence-based results. Even in academic online learning, the fairly secure home of constructivist practice, testing and measurement burrow deeply into virtual classrooms.

The wall separating corporate and academic instruction is a pretty high jump, even though there are now some minor cracks. According to a recent report, social networking, Web-based communities, blogs, podcasts, and other so-called “Web 2.0 technologies have dramatically shaped the daily work experiences of professionals everywhere [3].” But even as many millions have joined Facebook, LinkedIn, and other

social networks and participate in online communities, so far they fall outside the learning function at most companies.

There is one place, however, where corporate and academic Web learning meet—at the crossroads of tuition reimbursement, the \$16.5 billion tuition assistance that US companies spend supporting personnel who enroll in accredited degree-granting programs as part of employee benefits packages [21]. When colleges first offered online degrees, many companies frowned upon them, refusing to contribute to online tuition, claiming that the degrees were inferior. But recently, learning officers have come around to the other side, encouraging workers to enroll, recognizing the educational and personal benefits that make online education appealing. Some companies that are eager to build a cadre of talented specialists in fields that match their corporate objectives have targeted mission-critical online degrees for key employees [22].

Even though there are modest indications that the wall between industry and academic learning is not as lofty as it once was, it's questionable whether the two roads will ever join. E-learning is a vehicle for training; online learning a platform for education. The two have quite different aims and, consequently, as we have seen, very different methods and philosophies. But as global demands require more agile workers who can go beyond being merely skilled at procedures and who can adapt flexibly to post-industrial markets [23], corporate training officers may yet turn to collaborative, peer-to-peer learning as a prudent option. Doubtless, right now, progressive corporate thinkers are exploring ways to absorb some of the positive lessons drawn from academic online learning in corporate web instruction.

VI. ABOUT THE AUTHOR

Robert Ubell, vice president of Enterprise Learning at NYU Polytechnic Institute, is responsible for the university's relationships with corporate clients. He also manages the university's executive education and online programs. Before joining NYU-Poly, Ubell was at Stevens Institute of Technology where he launched the school's award-winning online graduate program, WebCampus.Stevens. Earlier, he was editor of the National Magazine Award-winning monthly, *The Sciences*, and American publisher of the premier British science weekly, *Nature*. He was founding publisher of *Nature Biotechnology* and the author or editor of 6 books and more than 60 scholarly articles. His latest book, *Virtual Teamwork*, was published by John Wiley & Sons in 2010. He serves on the Sloan-C Annual Conference Steering Committee and is on the Board of the Sloan Consortium.

VII. REFERENCES

1. **Frost, R.**, "The Road Not Taken." In *The Poetry of Robert Frost*, 105. New York: Holt, Rinehart and Winston, 1969.
2. Throughout this essay, "e-learning" refers to *corporate* web-enhanced training, while "online learning" is the term used for *academic* web-based education.
3. ASTD. *2009 State of the Industry Report*. Alexandria, VA: ASTD, 2010. The report says that about 5% of corporate e-learning is instructor-led. ASTD also reports that in 2008, US companies spent \$134.07 billion, a sum that includes public sector investments in learning. A much lower figure of \$56.2 billion, reported by Bersin & Associates for the same year, excludes federal and state funding.
4. **Allen, I. E., and Seaman, J.**, *Learning on Demand: Online Education in the United States*, 2009. Babson Park, MA: Sloan Consortium, 2010.
5. **Hiltz, S. R., and Goldman, R.**, *Learning Online Together*. Mahwah, NJ: Lawrence Erlbaum, 2005.
6. **Ubell, R.**, "Dewey Goes Online." In *Virtual Teamwork*, edited by Robert Ubell. Hoboken: John Wiley & Sons, 2010.
7. **Vygotsky, L.**, *The Problem of the Cultural Development of the Child*. 1929. <http://www.marxists.org/archive/vygotsky/index.htm>.
8. **Ubell, R.**, "Virtual Team Learning." *T+D*, August 2010.

9. **Pressey, S. L.**, "Development and appraisal of devices providing immediate automatic scoring of objective and concomitant self-instruction." *Journal of Psychology: Interdisciplinary and Applied*, 1950: 417-447.
10. **Skinner, B.F.**, "The Science of Learning and the Art of Teaching." *Harvard Educational Review* 24, no. 2 (Spring 1954): 86-97.
11. **Dean, C., and Whitlock, Q.**, *Handbook of Computer-based Training*. London: Kogan Page, 1983.
12. Ambient Insight. *The US Market for Self-paced eLearning Products and Services: 2009-2014 Forecast and Analysis*. Monroe, WA: Ambient Insight, 2010.
13. **Nicholson, P.**, "A History of E-Learning." In *Computers and Education: E-Learning from Theory to Practice*, edited by et al. B. Fernández-Manjón, 1-11. New York: Springer, 2007.
14. **Watkins, B. L.**, *The Foundations of American Distance Learning*. Dubuque: Kendall/Hunt, 1991.
15. **Woolley, D. R.**, "PLATO: The Emergence of Online Community." *Matrix News*, January 1994.
16. **Sivunen, A., and Valo, M.**, "Communication Technologies." In *Virtual Teamwork*, edited by Robert Ubell. Hoboken: John Wiley & Sons, 2010.
17. Some pre-Internet era visionaries who imagined virtual collaborative learning include futurist Buckminster Fuller, Stanford philosopher Kenneth Suppes, and American inventor Raymond Kurzweil.
18. **Nagel, D.**, "Most College Students to Take Online Classes Online by 2014." *Campus Technology*, October 2009.
19. **Baum, W.**, *Understanding Behaviorism*. New York: HarperCollins, 1994.
20. **Dewey, J.**, *The School and Society*. Chicago: Chicago University Press, 1915.
21. **Howard, C.**, *Tuition Assistance*. New York: Bersin & Associates, 2009.
22. **Adams, J.**, "SAIC, NYU-Poly Team for Cyber Degrees." *GovCon Wire*. 2010 5-May. <http://govconwire.com/2010/05/saic-nyu-poly-team-for-cyber-degrees/>.
23. **Ambrose, J.**, *Personal communication* (2010).