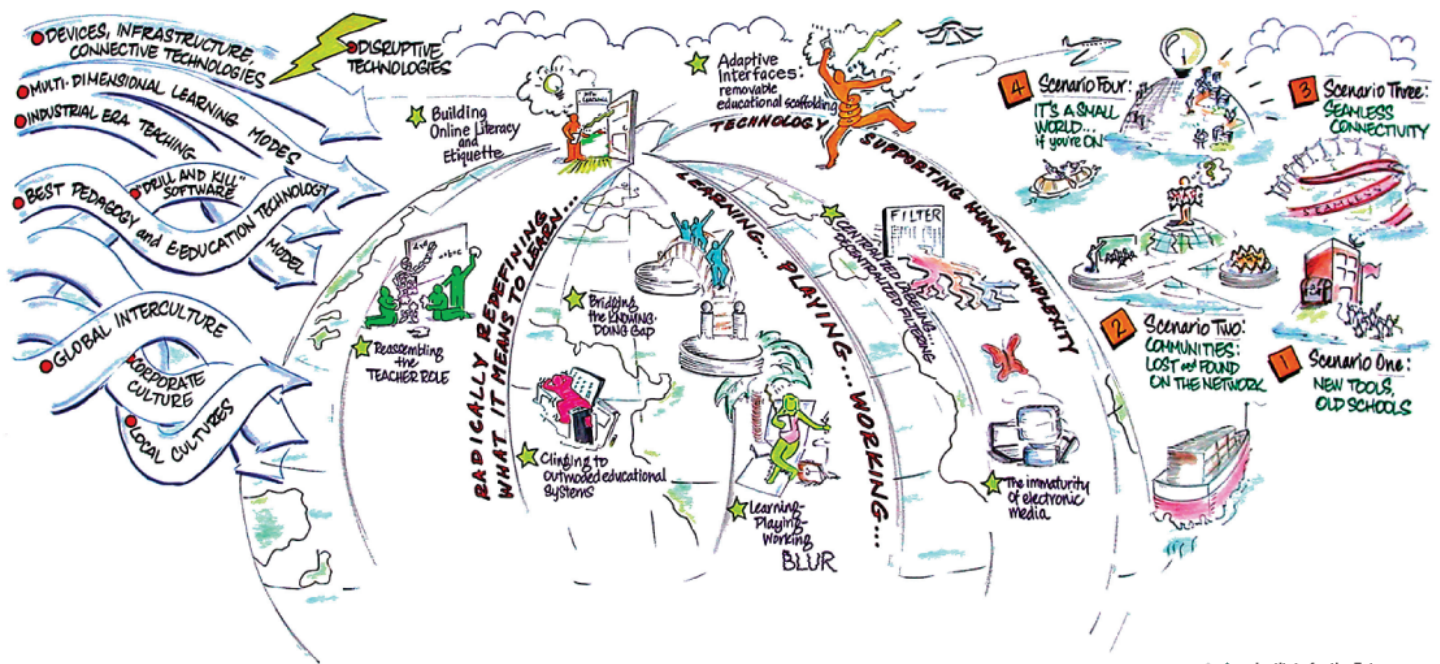


The Future of Global E-Education



THE FUTURE OF GLOBAL E-EDUCATION

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Table of Contents

The Future of Global E-Education

The future of e-education is highly uncertain and will vary across the globe. To help inform policy- and decision-makers in the face of that uncertainty, Vivendi Prospective asked Institute for the Future to conduct a futures scenarios project. This report, distilling insights from a multi-layered international futures exercise and IFTF research, offers a unique lens on a broad spectrum of issues associated with e-education.

- Part One details four 2010 scenarios (plausible but uncertain futures) developed by a global group of education experts, amplified through fictional vignettes, explored for strategic implications, and linked to relevant current opinions and facts.
- Part Two outlines six critical crosscutting issues raised by the scenarios, including edge ideas and practices, guidelines for policy-makers, and links to best resources.

The Institute for the Future, a 30-year-old futures research organization based in Silicon Valley, San Francisco, New York and Beijing, conducts shared-cost research on technology, health care, demographics, culture, business, and education. Clients include multinational corporations and nonprofit and government organizations. Recent publications on education and technology include the Future of Educational Technology Horizons Map for the U.S. Department of Education and the Window on Talent and Learning for IFTF's Emerging Technologies Outlook project. Vivendi Prospective is a research institute based in Paris, France created in the year 2000 to evaluate long-term trends in social behavior, specifically involving technological developments in the fields of environment and communications. E-education is one of three areas of initial focus.

Executive Summary

Overview

E-education covers a vast territory: lifelong learning at all ages and venues, from the home to work, with learning inside and outside institutional settings. With traditional institutions struggling to improve through technology and new learning paradigms, education is caught between two worlds. “We have one foot on a jet and another on a burro,” as Stanford Professor of Education Decker Walker said. The tension plays out in different ways in different geographies and levels of education.

The Institute for the Future uses future scenarios as a way to get a fresh view of the policy issues for in-depth analysis and a roadmap for decisions. Scenarios are depictions of possible futures built upon variables selected for their high degree of importance and low degree of certainty. Scenarios are descriptive rather than predictive. They are a vehicle for delving into unexplored territory to uncover critical questions, probabilities, and nuances of policy issues that must be addressed. They serve as a communication tool for opening conversation among different stakeholders.

For the purposes of building scenarios about the future of e-education, we focused on three educational fields: primary/secondary schools, universities, and corporate settings in three vast geographic regions: Asia, Europe and North America. Analyzing E-Education required analysis of education in general, with technology as a tool for (not a driver of) optimum learning conditions. Given the scope of the project – with hundreds of possible variables – we refined the process to include a range of possibilities for each variable, then developed four plausible scenarios to illustrate and explore in depth, seeking issues and implications.

Scenarios in Brief

IFTF developed four scenarios by combining different variables into configurations that depict plausible futures. They are set in the year 2010 and are fleshed out in detail in the next section of this report. The following is a brief snapshot of each scenario:

Scenario 1: New Tools, Old Schools. A frustrated American teacher and a resourceful Belgian technical school student illustrate this scenario in which cheap, pervasive connectivity and devices fail to produce relevant, pedagogically sound e-education. In this scenario, the general approach to learning remains teacher-centric in the classroom. Students in all but the poorest and most isolated geographies will have access to the Internet and popular technology, but schools do not have the staff or materials to offer much guidance or preparation for networked society.

Scenario 2: Communities: Lost and Found on the Network. A multi-tasking Costa Rican university student and Chinese roommates on different educational tracks are the subjects of this scenario, which also presupposes pervasive technology and stalling of e-education pedagogy but assumes a multi-modal approach to learning. In and outside of classrooms, there is emphasis on communities of practice, mentors, experiential learning and relationship between the real and virtual world but generally students and teachers must cobble together their own curriculum to navigate a highly polluted and poorly mapped sea of information.

Scenario 3: Seamless Connectivity. An American Peace Corps volunteer and a French corporate learner illustrate this “rosy scenario,” which assumes access to broadband will be pervasive with solid e-educational technology and software. Teaching and learning mesh into a single multi-dimensional experience, in synch with networked culture in which the languages, values, and ideas of different cultures will be exchanged, translated and mutually understood for all but a few remote unconnected areas which are the recipients of volunteer and charitable nonprofit organizations.

Scenario 4: It’s a Small World (If you’re “On”). A “Young Innovator” in a Chinese secondary school and an 8-year-old international design team member are the subjects of this scenario, which assumes that access to broad-

band will be spotty but e-education will progress. Those in connected areas will become part of the global networked society united by technological access to ideas and a multi-dimensional learning approach. Those who are off the grid will be separated not only from the global network but also are likely to feel different from people in their own countries who are “always on.” The digital divide becomes a cultural chasm.

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Themes

Insights emerged at each phase of the project, leading to our analysis of six policy issues. While each region and phase of human development presents a unique set of challenges for e-education, we found a surprising number of themes that crossed geographic and age boundaries. These are explored in the scenarios and issues that follow but deserve special mention, as they represent fundamental shifts in thinking.

Radical re-definition of what it means “to learn.” Caught in Industrial Age thinking where the word “learning” is associated with “lessons,” educators must struggle out of a confining old mindset. Education/learning as primarily the transfer of predigested information is passé. The Information Age equivalent has yet to be clearly defined. It combines the Agrarian Era notion of apprenticeship with inspiring lectures, but with new elements of reflection, peer review, and with access to virtually unlimited resources. Cognitive researchers have valuable insights into the conditions that allow people to learn most effectively. Most educational institutions are not structured to accommodate multi-dimensional learning, but many are slowly evolving. Effective e-education will incorporate the evolving understanding of learning.

Reassembling the teacher role. The role of teacher is evolving along with growing awareness of how true learning takes place. No longer a singular position, “the teacher” (both in the classroom and in e-education) breaks into a multiplicity of roles involving different types of expertise: inspiring, guiding, evaluating, and supporting learners in an increasingly complex society. Who will fill what teaching role (or combination of roles) depends on the phase of the learning process. The actors may vary depending on student/teacher relationships, which blur together when there is more focus on the learning environment rather than on the roles individuals play within the environment (as is the case in private sector e-learning efforts that go beyond the student/teacher paradigm with people engaging at different levels of expertise).

Workarounds when the system fails. Even as educators today are lamenting their lack of training and equipment for incorporating e-education into their classrooms, those with an interest are finding ways to engage students. Informal learning occurs in many ways. There’s no perfect system

or better time than now for educators to facilitate relevant student learning for the Information Age wherever they are with whatever technology they have (even if that is just human imagination). Support must be provided for teacher and student readiness for the Information Age – developing rich learning experiences irrespective of access to devices, connectivity, or e-education programs. Communities of learners and teachers are thriving globally and making connections with schools where there are no telephones, much less photo-swapping PDAs. When systems fail, workarounds prevail – and sometimes lead to breakthroughs.

The immaturity of electronic media use. With mass usage of the Internet less than five years old, this is a spanking new medium with much untapped potential for creative means of expression. When movies were new, filmmakers typically staged “plays” in front of a fixed position camera and it took decades for the maturation of special effects, multiple camera angles, lighting tricks and other aspects of film. Similarly, common use of the Internet involves traditional text. In the future, creative use of imagery, new symbols, program logics, communication methods, and other multi-dimensional uses will evolve. Unfortunately, decisions about the future are being based on the state of current popular technology use– not the experiments that offer hints of future possibilities.

The learning/playing/working blur. At present, learning, playing and working are considered separate compartmentalized functions. They can converge when people are engaged in meaningful activity. With advancing technology, it is possible for people to get as-needed information to complete their work. New pedagogy based on brain research reveals ways people learn through interactive games. Workers are more productive and less stressed as they are encouraged to perform tasks in ways that are consistent with their unique approach and supported by communities and information. E-education is a medium that can carry the message – that learning, playing and working can occur simultaneously – if it is created with entertainment, information, and educational expertise.

Centralized labeling, decentralized filtering. The exponential growth of information demands organization by trusted sense-makers who can help the masses evaluate and sort Internet resources. Currently a primary school student’s essay on a beach visit and a Nobel Laureate’s research findings could both come up in answer to a search query about crustaceans. Evalua-

When systems fail,
workarounds prevail...

tion of content by librarians and other trusted sense-makers is necessary, especially for young minds that do not know a prestigious science journal from a dilettante writer's opinion piece. Many schools and corporations are beginning to create and provide information filters for students and employees, but individuals need skills. Future education must include helping people learn to screen content.

Adaptive technology: Supporting human complexity. Technology is simple, people are complex. So-called “smart technology” is of course the result of people putting tools to smart use, making everyday operations easier so that people can do what they do best. Debates about future artificial intelligence possibilities aside, it's unlikely that over the next few decades (if ever) we will see a machine that can come anywhere near the human brain for managing and generating complexity. “Adaptive technology” learns with the learner. These cognitive amplifiers modify themselves to accommodate the learner's individual learning styles, preferences and needs. Current popular technology is of limited service — supporting people who can manipulate language and machines in a certain way. Consider this: With his learning style and limitations, Einstein (who could not drive a car) might not have been able to navigate the Web. Adaptive technology, however, can support quirky brilliance.

Variables

The future of e-education will be determined by many driving forces, approximately 100 of which were identified, ranked and sorted by global education experts for this project. Scenarios are based on driving forces that are ranked as highly important and highly uncertain. Typically, variables represent two opposite possibilities that are imposed on a known circumstance to project alternative future outcomes. However, given the multiplicity of fields of education and geographies covered by this project, the variables play out as ranges rather than as poles of possibilities. The following is a brief explanation and analysis of the variables, which provided a basis for the scenarios.

1. Availability of devices/connectivity vs. Limited access to devices/infrastructure

On one end of the spectrum is spotty infrastructure with limited access to devices in many parts of the globe. On the other end is diffusion of wireless and wired Internet, affordable devices, small scale power systems, inexpensive broadband, convergence of technologies, and proliferation of connective technologies such as geographic positioning systems making connectivity available in even the most remote areas of the globe. In between is a range of possibilities in which individuals, government, business, and educational systems have varying degrees of control over how technology is used.

Zones of Certainty. Business will provide employees with the devices and connections they believe will help meet their bottom-line goals. Educators in traditional schools and universities increasingly will recognize the potential of technology to facilitate creativity, collaboration and knowledge creation but will face varying degrees of institutional resistance for appropriate technology purchases due to legacy systems, external controls and budget limitations.

Zones of Uncertainty. For (noncorporate) educational institutions, the highly uncertain critical drivers for technological access include: convenience and expense of connectivity, convergence of different technologies (for example, television and the Internet), cost of devices and connection, government regulation, financial support (from community, government,

Businesses are much better positioned to take advantage of new understandings about how learning takes place.

business – for example, the U.S.A. “e-rate” reducing cost of Internet use for schools). Also uncertain is whether the best educational devices will be selected, given factory-era organizational assumptions. In the scenarios we explore the tradeoffs and a range of possibilities, including that the digital divide could become a cultural chasm.

2. Recognition of multi-dimensional learning modes
vs. Industrial Age teacher-to-student transmission model

At one end of the learning spectrum, the linear information-delivery system (teacher gives lessons, students are tested on how well they absorbed the lessons) has been the norm in most schools internationally since the late 1800s. The other end of the spectrum is a multi-faceted educational experience based on the theory that individuals create their own knowledge. This involves informal, social, and individually reflective learning opportunities as well as listening to ideas delivered by teachers and/or experts.

Zones of Certainty. Within schools of education globally, debate will continue about the value of and approach to collaborative learning, individual creation of learning materials, meta-cognition, experiential learning, multiple intelligences, and developing new competencies for the Information Age. New ideas will dominate the pedagogical approach in the future as new teachers move into classrooms. They will be struggling against regulations that mandate curriculum and strong pedagogical traditions hampered by standardized testing approaches of the Industrial Age. Businesses are much better positioned to take advantage of new understandings about how learning takes place.

Zones of Uncertainty. There is great uncertainty as to whether traditional educational institutions can/will overcome resistance to change, given the necessity of revamping traditional classroom roles, revising testing methods, and obtaining technological support. Multi-dimensional learning occurs outside as well as inside the classroom, requires attention to the personalities of individual students, and involves a new approach to time, interaction, and production. It doesn't necessarily fit into classrooms that are separated by age and divided temporally into bell-driven “periods” for different subjects. If lines become blurred between teacher/student, work/play, mentor/peer, and socializing/collaborating in general society,

there may be a thin line between creativity and pandemonium in the classroom unless institutions gracefully adapt to the new learning paradigm.

3. Convergence of best pedagogy and technology in e-education software vs. “drill and kill” software

At one extreme, the best thinkers in technology, education, and entertainment will have the public support, money and professional motivation to put their heads together to create lively educational software that seamlessly blends information, experience, and inspiration for students all over the globe. At the other extreme, software will fail to evolve but will be limited to talking heads, streams of text, and worksheet-type exercises with right-and-wrong answers. In between are varying levels of quality and distribution of e-education, leading to an uneven learning field.

Zones of Certainty. It is a foregone conclusion that lively educational software will be produced – the kind that involves experiential interaction, scaffolding that can be removed as competence develops, and sophisticated depiction of information that cannot be conveyed in other ways. Prototypes for this kind of software were developed in the early 1980’s. However, educational technologists who 20 years ago were excited by the possibilities for e-learning through sophisticated simulations and games found themselves being recruited by the entertainment industry because the public education sector lacked money and motivation to sponsor development of exciting e-education materials. Business will continue to lead in this area because of cost-savings for training and education.

Zones of Uncertainty. Drivers of change will be the progress (or lack thereof) in the development of modular curriculum, strong partnerships between educators and technologists, digitized library materials, indexing systems for ease of navigation, financial incentives for teachers/professors to develop curriculum, resolution of intellectual property issues, buy-in from teachers and professors, and public support translating into government (and/or business) dollars. Also uncertain is the extent to which all of these efforts will be integrated. These factors will influence another uncertainty: the extent to which shoddy, culturally insensitive “shovelware” will diffuse if it is the only available e-education. The scenarios examine the effects on students of diffusion (or not) of excellent vs. poorly developed e-education materials.

Local Cultures, Corporate Culture, and the Emerging “Interculture”

As the world grows “smaller” through connectivity, some local cultures are struggling for momentum to remain vital. Through the media and growing international trade, a strong global corporate culture is overlaying its symbols and values on top of local cultures, creating a dissonance. At the same time, there is an incipient “interculture” that is emerging – via global nomads, multilingual and polycultural scholars, and people engaged in international virtual communities of practice. Interactions among diverse cultures are creating a new mix of ideas, symbols, and values that are blending organically toward the emerging interculture.

Zones of Certainty. Global economic connectivity is a foregone conclusion. Seeing the economic benefits of an interculture, the more successful corporate mergers increasingly will employ culture analysts to blend disparate geographies. There will be increased diffusion of corporate culture. Schools will develop more methods to “teach” about multiculturalism, linking students with their global counterparts through technology as simple as old-fashioned pen pals. Growing numbers of students will travel abroad through school or various volunteer programs, creating a “New Economy Corps” of sorts, and these will undoubtedly increase in emerging economies that are struggling for inclusion in the global economy.

Zones of Uncertainty. There is uncertainty about global educational connectivity, and the extent to which institutions will be motivated/able to invest the time and money necessary to introduce students to the Interculture. There is also uncertainty about which governments will have the motivation and funds to invest in technology that will preserve and share local culture (thereby diminishing the influence of corporate culture and putting local culture on the global “stage”). Drivers include the success of educator/technology partnerships, the extent to which e-education is commercialized, the willingness of isolationist countries to open schools to outside. Also uncertain is which geographies will have people motivated to articulate and assert their values, art forms, literature, and version of history through informal communities of practice. . The scenarios in this report evoke different possible futures for cultural diversity.