

Chapter 1

Transitions in Teaching and eLearning

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Key Questions

1. How are learning theories and teaching practices changing with eLearning?
2. How does a socially constructed learning environment change the teaching and learning process?
3. How are the new learning designs impacting the teaching and learning processes for all children, rich and poor?

Emotion and Cognition

Ubiquity, in technology, and dissonance, in teaching and learning, are expressions of explanation for the complex change we are living in. How we roll with change and envision the new world we live in and hope to explain through information and knowledge is the motivation of this chapter. Cognition is one's ability to think and resolve situations based on our own experiences as a learner. Learning to the learner is continuous throughout life, as experiences continue to shape and change the ways we interact with the environment.

How one feels when one is learning is the emotion(al) element. Sad, happy, frustrated, etc. are all subjective characteristics that humans experience, especially when they are engaged in the learning process. Encouraging emotions from those around us requires us to understand that feelings do have a strong impact on how we learn and on how others learn. Critical in understanding the learning process, is how environmental and social learning is designed.

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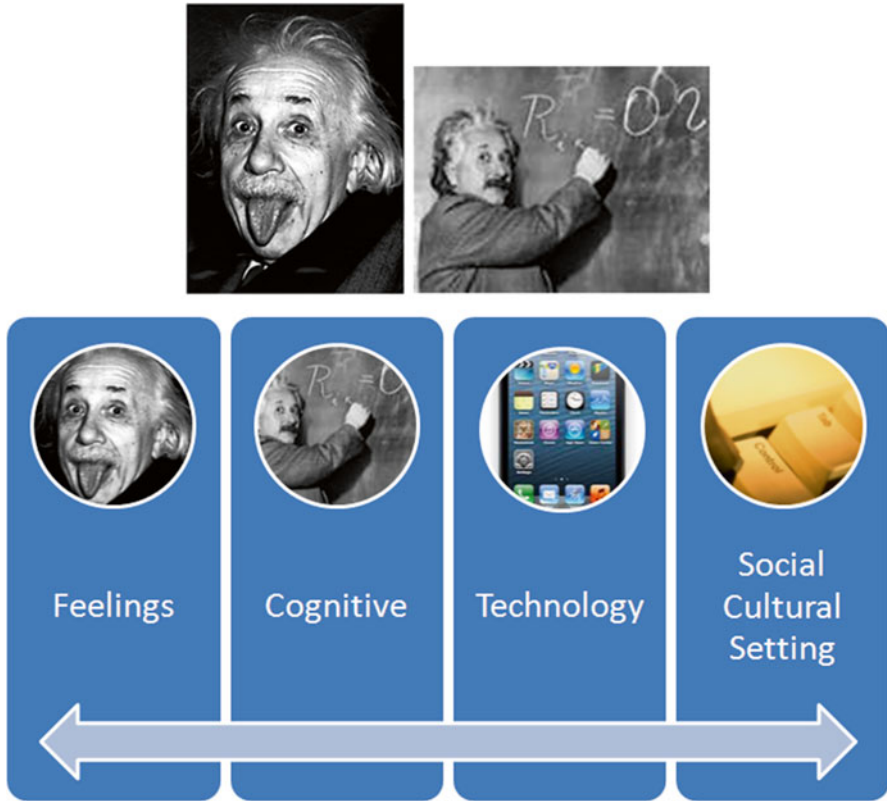


Fig. 1.1 Emotions and Cognition Combined with Technology in the Social Cultural Setting

Cognition is distinguished by how we think about sadness, happiness, frustration, etc. How we know what we know is left for some to debate. Gardner (1985) explained *cognition* as “efforts to explain human knowledge” (p. 6); Neisser (1967, as cited in Jenlink, 2013) notes learning as “all processes by which the sensory input is transformed, reduced, elaborated, stored, recovered, and used” (p. 4 as cited in Overskeid, 2008); Brunig, Schraw, and Norby (2011) view cognition as “human perception, thought and memory” (p. 1); and Vygotsky’s theory of social mediated learning (1997; 1978) leads to scaffolding, that is, learning that is done with an expert to assist the novice, which leads to the social cognitive theory by Bandura (2006), “most human functioning is socially situated” (p. 165).

Is it within the complexity of emotion and cognition, which is enmeshed in new ways of learning, that both must be considered when discussing the learner and the action of learning? Both contexts faced with the explosion of technological gadgets require the educator to understand the interactions to maximize the learning quadrant. What is the relationship between feelings and thinking? As you can see from the pictures in Fig. 1.1, Albert Einstein displays emotion and cognition: his ability to feel silly by sticking out his tongue and his cognitive intellect used to teach a class in quantum physics displays emotion and cognition. Jenlink (2013) feels that

cognitive science is a not very developed field and that emotion and cognition are to be considered the new tools of learning. The processing of this information has been likened to how a computer works, “The human mind takes in information, performs operations on it to change its form and content, stores the information, retrieves it when needed and generates responses to it” (in Woolfolk 1998, p. 250, as cited in Jenlink, 2013). Using this metaphor the humorous and scholarly pictures of Einstein offer the opportunity for us to conceive how multimedia tools can be thought of.

The interplay between feelings and thinking greatly influences how we approach our personal learning and the learning dynamics as to how others learn effectively and efficiently if one accepts the premise that it is emotions that allow compassion towards others. Many researchers, from Dewey (1938) to Vygotsky (1978, 1997), have viewed learning as situational dependent on the social cultural setting.

The Twenty-First Century Context of Learning Theories

From the late nineteenth century to the early twenty-first century, Table 1.1 (Papa & Papa, 2011) displays learning theories that attempt to explain how we learn. These theories guided how we taught in our schools and universities.

How we construct knowledge influences the practices of teaching and the tools utilized. *Behaviorism* as begun by Watson and further developed by Skinner relates to stimuli and response. *Cognitive constructivism* theorists ranged from the late 1880s theories from Freud, Piaget in the mid-1920s were exponentially furthered by Erickson and Bruner founded on the ideas of pedagogy focused on how children grow and develop their learning patterns. Bloom’s taxonomy combined the cognitive/knowledge acquisition with the affective/emotional aspects of the learner. Parallel to these theorists interlacing with behaviorism and cognitive constructivism was Vygotsky’s development of social constructivism and later Bandura which ascribed to a learning that occurs first on a social level and interfaces strongly with motivation. Also, during this time Maslow’s hierarchy as to how we learn is based on the humanist aspects of the learner which lead to Rogers’ inclusion of feelings and emotions. Both agreed that learning is begun within the personal. Dewey like Maslow believed the greatest learning environment initiated in an experiential learning environment which is there was strong motivational stimuli and nuanced the differences on how boys and girls learned, found in the writings of Gilligan and Levinson, and combined with one’s locus of control (Brown) fairly encompassed the learning theories of the nineteenth and twentieth centuries focused on children. By the 1970s, several of these theories were expanded to how adults learn, from Knowles to Cross, and Gardner’s multiple intelligences instituted learning from birth to grave.

Educational technologists have yet to identify how multimedia tools can best be used to engage, motivate and expand human learning. The exponential growth of technology tools in combination with the Internet have 21st learning theorists still trying to make sense of where we are in explaining how we teach and learn. Learning today can be personalized visually, audibly, and within simulations and is embedded in one’s learning through activity.

Table 1.1 Learning theories and timeline of theory development*Behaviorism*

Watson (1900–1930) and Skinner (1940–1980) Behaviorism: The study of objective behavior and learning as response to positive or negative stimuli.

Cognitive Constructivism

Freud (1880+) & Erikson (1959+): Stages of the Life Cycle included adult development beyond adolescence. Erikson took Freud's work that ended with adolescence and developed a theory that reached to old age.

Piaget and Cognitive Constructivism (1920+): Four stages of development: final stage Formal Operations (ages 11–15) assumes this age reaches adult cognition and conceptual reasoning abilities. Knowledge is constructed through individual experiences.

Bruner (1950+): A founding father of constructivism which found that learners construct ideas based upon previous learned knowledge

Bloom's Taxonomy of Educational Objectives (1965+): Learning occurs both cognitively (knowledge) and affectively (beliefs, values and attitudes).

Lave (1990+) & Wenger's (1999+) Communities of Practice: Situated learning and engagement in communities of practice for adults is the focus of their theory.

Social Constructivism (learning occurs first on a social level)

Vygotsky and Social Cognition (1920+): Development of the individual occurs on first a social level and later on an individual level. The potential for development occurs when children participate in social behavior. This is called the Zone of Proximal Development.

Bandura's Observational Learning (1960+): Operant view of learning that is comprised of four steps: attention, retention, reproduction, and motivation.

Humanist (learning occurs at the personal level)

Maslow (1930+): Experiential learning with an emphasis on choice, creativity, values, self-realization, and dignity.

Rogers (1960+): Inclusion of feelings and emotions in learning. Learning occurs at a personal level.

Motivation

Dewey (1930+): Experiential learning leads us to more learning.

Glasser Control Theory (1990+): The theory of motivation and what a person wants most at any given time. Choice is at the heart of this theory.

Brown Locus of Control (LOC) (1980+): Internal and external locus of control factors that influence how we view ourselves and others.

Gilligan (1980+): Feminist voice given to adult learning and cognition.

Levinson (1970-): Male and female adult life stages identified.

Intelligence (multiple attributes to defining creativity)

Guilford's Structure of Intellect (1950–1980): The intellect is comprised of operations, contents, and products, with a focus on creative abilities.

Gardner's Multiple Intelligences (1980+): Individuals possess distinct forms of intelligences in varying degrees.

Adult Learning and Pedagogy

Knowles (1970+): Founding father of adult learning views learning as cyclical: experience leads to reflection that leads to action which leads to concrete reflection, and so on. Andragogy refers to adult learning vs. pedagogy that focuses on children.

Cronbach & Snow Attitude Treatment Interaction (1970+): Learning is best achieved when strategies are geared directly to the learner's specific abilities.

Cross (1970+): Adults as learners model (CAL) views learning as lifelong

Freire (1970+): The critical analysis of experience and acting on that analysis leads to more learning.

Reprint from Papa, R. & Papa, J. (2011). Leading adult learners: Preparing future leaders and professional development of those they lead, pp. 91–107. In R. Papa (Ed.) *Technology leadership for school improvement*. Thousand Oaks, CA: Sage Publications, Inc.

Situated Cognition Theory

Situated cognition theory was built upon and described by the research of Brown, Collins, and Duguid (1989) as

The activity in which knowledge is developed and deployed...is not separable from or ancillary to learning and cognition. Nor is it neutral. Rather it is an integral part of what is learned. Situations might be said to co-produce knowledge through activity. Learning and cognition, it is now possible to argue, are fundamentally situated. (p. 32)

Learning and cognition experiences are necessary components when considering the interaction with learning designs to reach all learners. How situated cognition theory addresses the sociocultural context or activity complicates the individual learner and the artifacts surrounding the context. It is not possible to consider one's situation outside the affective domain of emotions. As Jenlink (2013) describes the goals of situated cognition,

The focus is on assisting the learner to move from novice to more capable and independent expert, a person who learns to use their expertise, intuition, and deep understanding to solve problems of their choosing. This requires authentic experiences with opportunities to examine ideas, develop underlying concepts, and engage in activities to successfully complete a learning experience. (p. 186)

How situated cognition theory connects to eLearning is primarily through Web-based learning communities. Information on the Internet is presented as a one-size-fits-all approach, that is, all learners read the same page. Through professional learning communities and the peer-to-peer interactions that occur in Web-based learning communities, this theory has merit. Jenlink (2013) notes there are still many issues to be resolved which makes sense given the complexity and rapid growth of tools being developed. Figure 1.2 depicts the four questions that Jenlink believes represent the future is yet to define.

Disruptive Learning Design

Digital natives are those now in K-12 schools. They are being taught by mostly digital immigrants. How can the generational chasms be crossed? The coming 5 to 10 years will be a bumpy ride according to Hill (2012, November–December) for traditional institutions.

The investment community, particularly venture capital and corporate mergers and acquisitions, have a built-in trial-and-error approach. There will be successes and there will be failures. Failures are to be expected, and one attribute of investment-based new models is quick failure and quick adaptation. As a system, higher education is not structured for rapid change, and there will be a battle of cultures as investment-backed educational technology intersects with slow-paced, conservative educational structures. (p. 2)

This chapter's focus is on the individuals cognitive and emotive characteristics aligned to learning. What are the lessons for the educational institutions that have as their primary mission the creating of optimal learning environments? According to

As cited in Jenlink (2013, pp. 192-193), Allal (2001) notes the following unresolved issues found in other researcher posed questions:

1. Are there aspects of situated cognition and learning that, however much a part of human culture, need to be overcome? Bereiter (1987)
2. Is participation in the classroom micro-culture sufficient for appropriation of social practices and for progression of conceptual understanding? (Lopez, 2001)
3. Do all students participate in the co-constitution of classroom culture? (Lopez, 2001)
4. How in the 21st century shall we further explain thinking, acting and being? (Schoenfeld, 1999).



Fig. 1.2 Imagined Future Through Thinking, Acting, and Being

Hill (2012, November–December) universities and schools as they are constructed are facing disruptive influences on their primary mission of teaching and learning. Growth in new online technologies means schools and universities must directly face:

1. Multiple delivery models;
2. Dissonance in policy and practices due to new alternating old delivery models;
3. Online programs should lower not raise student costs;
4. Online education provides a leveling competitive field for especially the research and regional comprehensive institutions and public schools by increasing alternative providers.

The disruption to the heart of the mission of universities and public schools questions the motivation of some politically appointed boards. The Libertarian perspective of total and complete marketplace competition with little regulation can lead to a rising mediocre future in knowledge generation. Online technologies are being used politically by conservatives to further their interests. These are mentioned here briefly to emphasize how essential it is for educators to understand the political as well and most importantly, the nature of multimedia learning and the impacts on the learner through teaching practices and philosophy.

The list by Hill is correct but lacks the broader educational picture which is the need for learning theorists, constructive cognitivists, and practitioners to aid in the resolve of this dissonance. Mayer’s (2009) cognitive theory of multimedia is focused on technology tools tangently while it is primarily focused on the learner and the relationship between pictures and words and their effects on learning. The ongoing development of this theory, which is approximately 20 years old, will potentially guide teachers at all levels and the educational software designers.

We will now explore the variety of new learning avenues.

Game Play

Games and structured play is not new to educational settings. Word and bingo type games or history simulations, open-ended scenarios to singing rhymes and poems are all evidence to the power of making education *fun*. Game play is theoretically based in situated cognition learning and in a study researchers have found that gaming videos are successful in some disciplines and not as in others. Young et al. (2012, March) recommend, “separating simulations from games and refocusing the question onto the situated nature of game player–context interactions, including meta-game social collaborative elements” (p. 61).

The advent of video games and the educational use of increased gaming in classrooms require all educators to determine if increasing the use of these multimedia tools enhances learning and is there evidence to prove it? Young et al. in their research performed a meta-review of studies that focused on curriculum impacts and the impacts from video games. Briefly, their findings were that there are no conclusions in science achievement that can be positively linked to video gaming, while in mathematics, language, history and physical education they found several positive relationships. Their positive findings include the following:

- (a) Mathematics—educational games need to be designed and researched with careful attention to contemporary learning theories, including customization of task difficulty to the learner’s capabilities, metacognitive reflection on the learning taking place and consideration of the rich situated interaction among learner, game environment, and classroom environment. (p. 68)
- (b) Language Learning—video games bring learners into an immersive exolingual environment that has historically been the most efficient way to learn a language ... although some may argue that language learning is more of an innate ability than learning mathematics or science concepts, we believe that it is reasonable to suggest that the immersive environments that video games create, and the human instinct to adapt and survive in those environments, can lead to more than just language learning. (p. 75)
- (c) Physical Education—there are potentially interesting connections between exergames and cognitive research on embodied or grounded cognition. (p. 78)
- (d) History—Knowing that gamers have a tendency to bypass information that is nonessential to completing game tasks, educators who develop historical games and mods might be better served by (a) using information delivery systems that are more integral to the game experience or (b) creating additional game elements that require reflection on the historical variables presented. (p. 80)

The Young et al. meta-review found that most research is done on the individual learner and excludes the teacher/instructor. This finding of the individual learner concentration is why they believe that “games cannot succeed as stand-alone solutions to education” (p. 83). Further, they found that a facilitator, teacher, or guide needs to be present for a progression of learning design is intentful, “that information being taught is indeed generalizable outside the context of the game, and (b) that deeper metacognitive gains are attained as a result of socially constructed game play” (p. 83).

Their advocacy based on their findings of a teacher/guide/facilitator as necessary for video gaming in classrooms is a strong recognition of the pedagogy required for creating sound situated learning environments that affects, “engagement, student behavior, and overall academic achievement” (p. 83). Again, using social learning arrangements involving peers and teachers is a notable addition to situated cognition theory and practice.

For profit interests, as found in a Pearson research report (McClarty et al., 2012, June) on gaming assumptions from the literature that included learning principles, engaging the individual learner with twenty-first century educational goals that are tested is what is aimed for. The report noted what most educators know that a motivated learner is the goal of producing and selling video games. Young et al. stated this notion as well in pursuing gaming as a viable educational tool. Where the company Pearson and the research from Young et al. differ is that the former focused on products for the individual learner and the latter focused on the need for more research on the teacher as facilitator of the learning environment and the role of social learning communities.

Learning not steeped in technology tools *where appropriate* is what twenty-first century teaching and learning is all about. Company technologists along with philanthropists (looking to make money off their technology products) want to convince us that teaching children in isolation of each other will improve learning. For-profit companies are motivated by profit. Educators must be at the center of understanding all the ramifications of technology to determine *when it is appropriate*. The concept of school and play are not new.

Mobile Apps

Currently there are “some 80,000 [mobile] apps available through Apple and 700,000 apps on Google Play (Flaherty, 2013, p. A2). Given that free apps are available on almost all mobile devices, such as cell phones and smartphones, iPads, iPhones, the accessibility to the grade and middle school student is unlimited. There are Federal Trade Commission rules that keep advertisers 13 and younger from being tracked how this is being determined is not clear. The need for this age group to use Facebook is not only not legal but more importantly less likely given the range of free apps available to them. Children of today do not use their parents Facebook.

B.Y.O.T.

Some school and university teachers are calling for students to bring their smartphones, tablets, video game players, iPhones, and laptops in an effort to stay on top of the technology and with little public dollars to support schools/universities purchasing the latest and best technology. This approach is called B.Y.O.T. (bring your own technology). Richtel (2013) in a New York Times, Business day article March 23, 2013, cited officials from schools in Central Florida and outside Houston believe

B.Y.O.T. is, “the simplest way to use a new generation of learning apps that can, for example, teach them math, test them with quizzes and enable them to share and comment on each other’s essays” (p. B1). Missing from this optimism is those students that do not have access to iPads etc., to bring to school. The schism between poverty and rich increases schooling opportunities that must rely on parental economics.

MOOCs: Adapt, Adopt, and Scale

Teaching thousands or tens of thousands of students at a time are online courses called MOOCs—Massive Open Online Courses. If individualized instruction is in dissonance with multimedia tools, this takes the class of 25–30 students and attempts by revolution to turn the classic classroom into a mega-class. The advent of MOOCs is a movement that began with the elite institutions, such as Stanford, MIT, Harvard, and the University of California—Berkeley and now others, to create *uber* tools online to influence education teaching and learning. Scaling up to an enormous number of students that in and of itself is meant to be *unlimited* numbers for many reasons. The idea originated to solve the need for duplicating course content offered by multiple sections (Hill, 2012, July). Hill believes that MOOCs can be successful as an educational model if the following is considered:

- (a) Develop revenue models that will make the concept self-sustaining;
- (b) Deliver valuable signifiers of completion such as credentials, badges, or acceptance into accredited programs;
- (c) Provide an experience and perceived value that enables higher course completion rates (in most MOOCs today, less than 10% of registered students actually complete the course); and
- (d) Authenticate students so that accrediting institutions or hiring companies are satisfied that a student’s identity is known. (p. 1).

Hill (2012, July) developed the Figure used below as a timeline of MOOC genesis (Fig. 1.3).

The ultimate scalability is yet to be determined. This approach is no more than 5 years old and currently prestige universities in the USA are generating the *university bred companies*, e.g., Coursera developed by two Stanford computer scientists (Friedman, 2013), as a precursor to taking courses from the most elite universities and professors.

Flipped Classrooms

EDUCAUSE defines flipped classrooms as, “a pedagogical model in which the typical lecture and homework elements of a course are reversed” (2012, p. 1). Students watch video lectures at home and go into the classroom at school for the

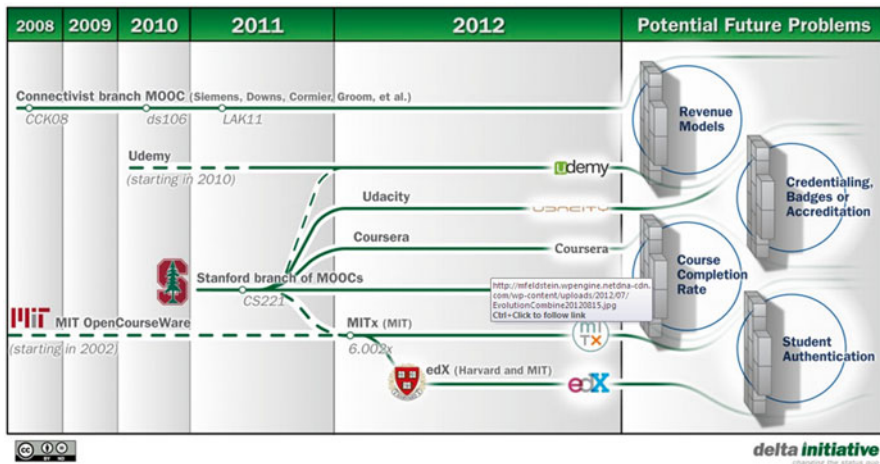


Fig. 1.3 MOOCs Timeline of Development

discussions, exercises, and projects. This makes the lecture synchronous, meaning that the student can watch the lecture at home on their time.

The notion of a flipped classroom draws on such concepts as active learning, student engagement, hybrid course design, and course podcasting. The value of a flipped class is in the repurposing of class time into a workshop where students can inquire about lecture content, test their skills in applying knowledge, and interact with one another in hands-on activities. During class sessions, instructors function as coaches or advisors, encouraging students in individual inquiry and collaborative effort. (EDUCAUSE, 2012, p. 1)

Prerecorded lectures are the hallmark of flipped classrooms. The advantage of this model is that students come prepared having watched the video for a robust discussion with the teacher facilitating. Teachers have to be organized to prerecord their lecture and students must have access to Internet capable of handling the connection speed. The emphasis in this classroom model is the engagement of active learning in class and out of class requires students to be responsible to do their homework and watch the class video. The disadvantage is the student’s home Internet access speed and computer. Again, parental economics are a part of this model that is not addressed.

Software Creation and Data Mining

Software creation for test taking is being created through various for-profit companies and elite higher education institutions, such as MIT and Harvard, so as to relieve teachers from grading exams. For the student this process is instant feedback

on an exam. MIT and Harvard (Markoff, 2013) are developing this software and are offering it free to anyone who will use it. In return they are data mining those who use it to further develop the algorithm and perfect the software. This is being done so that grading can be automated using artificial intelligence that has been mined from the thousands who uses the software product. Educationally, for test takers this is a great service to have immediate feedback. Part of the justification for this type of software development (free to the user while data mining to improve the algorithm) for the teacher is that as MOOC size classes continue to expand, teachers will not be able to keep up with large numbers of student papers to grade.

Clearly, the role of the university is being tested as never before. Are universities to prepare students ala factories as only disseminators of job skills? What type of cognitive development do universities as institutions of knowledge generation undergo? Where is online education taking the traditional university that began the twenty-first century yet already feels outdated? In this infancy known as the dissonant innovator of multimedia, social media, and MOOCs, most of the discussions today are framed around the technology itself.

This conversation needs to shift to how the twenty-first century learner can and will learn best in this futuristic setting where universities have undergone their transition remembering that they are the purveyors of knowledge.

Educational Media and Textbooks of the Twenty-First Century

The enormous dissonance in print copy textbooks and e-books, videos, social media tools is cataclysmic as traditional textbook publishers rush to restructure and follow the illusive new multimedia market. In the preponderance of new software and tools, from free apps to online availability, there is a sizable shift from the noting on a class list or syllabus the book(s) you must purchase for a specific class to the world of online education that may already have embedded videos, as found in MOOCs or flipped classrooms, as well online readings.

Young (2013, January) positions this movement away from print in this way: textbook publishers feel that their “newest digital products shouldn’t even be called textbooks” (p. 1) and quotes a publisher who defines their product as “personalized learning experiences” (p. 1). In Fig. 1.2, educational delivery models are visualized by Hill (2012, July, p. 1). The figure depicts the dramatic shift in course design to the radical and new delivery methods and providers of educational software (Fig. 1.4).

At the time of this chapter writing, universities are moving in the direction of hiring companies to help them build the MOOC and flipped classroom content. Young (2013) also reports that other large publishing houses are pursuing elite universities to explore partnership options in this new personalized learning environment; Pearson publishers call their products (formerly known as textbooks) “customizable learning experience” (Howard, 2013, p. 3). And textbook companies are expanding their ability to stay afloat by purchasing software companies and

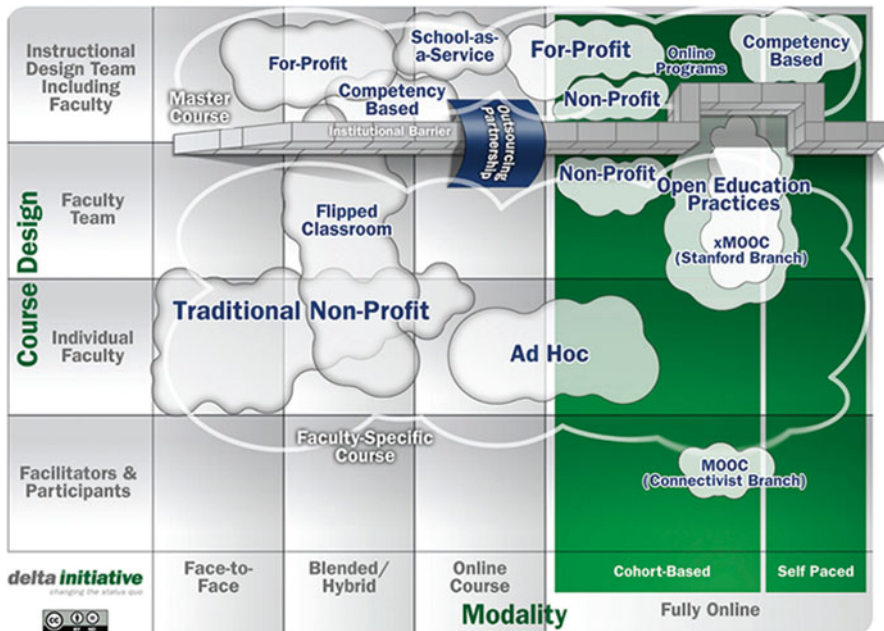


Fig. 1.4 Educational Delivery Models as of 2012. Hill, P. (2012, November-December). Online educational delivery models: A descriptive view. *EDUCAUSE Review Online*, 46(12). Retrieved April 13, 2013 from <http://www.educause.edu/ero/article/online-educational-delivery-models-descriptive-view>

developing in-house multimedia teams to translate the former print products into eLearning opportunities.

Habits are still hard to change among students. The digital native Shaffer (2012) finds in his recent study that students still desire hard copy books. At this point, one might project that hybrid tools, such as hardcopy books used with PowerPoint presentations, videos, URL’s, all will be also accessible on Kindles and iPads.

Participative Learning

What is meant by participative learning? A community of learners? In today’s complex world of the merging of visual and written with instantaneous social feedback and artificial intelligence assessment, participative learning fosters the environment to motivate the learner into interconnected linkages of disparate knowledge acquisition faster. For example:

- (a) Using the non-static Whiteboard vs. the static PowerPoint;
- (b) Integrating simulations into the curriculum of history;
- (c) Teaching philosophy through the use of blogs;
- (d) Conducting social media eKnowledge exchanges with other teachers and their students;
- (e) Doing virtual mathematics tutoring classes using software;
- (f) Learning writing through wikis, blogs, and podcasts;
- (g) Developing webcams for online teaching enhancements for science activities; and
- (h) Understanding instant feedback loops in free social media apps.

Privacy

As with data mining, the potential for student data collection that is part of the twenty-first century terrain being mined for uses beyond the school and district are exponential. Who decides who sees or can access the data? New software such as inBloom “offers a vision of new uses for data in education” (Singer, 2013, October 6, p. 15). Through the financial support of the Bill Gates foundation, inBloom is a product that will become part of the \$8 billion education market to work with Common Core State Standards’ assessments to analyze individual student performance. Singer, in the New York Times article, notes that federal education privacy law, the Family Educational Rights and Privacy Act, have recently changed to help the industry grow, has updated rules permitting “schools to share student data, without notifying parents, with companies to which they have outsourced core functions like scheduling or data management” (p. 15). She calls this a techno-utopia plan found on inBloom’s Web site. The concern becomes does the school district have policies that limits this data mining?

Conclusions

This chapter has focused on many aspects eLearning affords the learner and the teacher. It also has raised some startling questions that relate to parental increasingly disparate confluence between the rich and the poor. Finally, as political policies continue to support the industry in education growth, what is being lost or abandoned requires all in education to question.

Application Activities

Idea 1

In your classroom, design a social media activity using Facebook, Twitter, Blog, Instagram, etc., to discuss the changing educational landscape embedded in social media platforms.

Idea 2

Within your community of learning peers, develop a MOOC series of courses for a terminal degree (high school diploma, Associate Arts, Bachelors, Masters) focusing on the teaching and learning components.

Idea 3

Develop a plan to handle teacher resistance and options for addressing it using situated cognition theory. Consider the potential causes of resistance—access grade affiliations, knowledge/skill (cognition) levels, and attitudes (emotion).

Idea 4

Write a district/university policy on protecting student privacy.

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