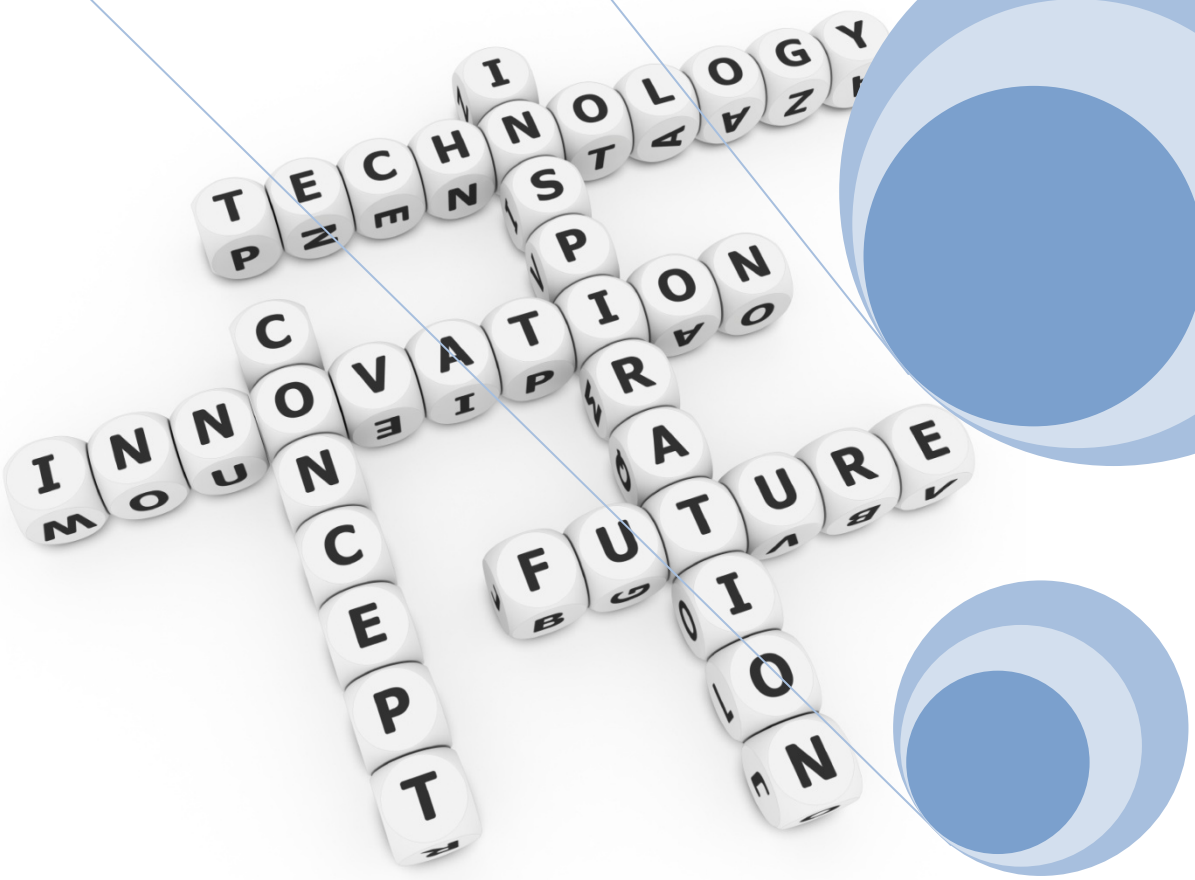


# Why Affective Learning in a Situated Place Matters for the Millennial Generation

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[This paper offers an interpretation of the generational divide associated with new media and learning.]

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Much ado has been made about "digital natives" and the importance of supporting how the millennial generation learns in shaping future education systems. Marc Prensky (2001) coined the term "digital natives" in his comparison to "digital immigrants." Prensky argued that a really big generational discontinuity or divide has taken place with the arrival and rapid dissemination of technology and new digital media (see Figure 1). The millennial generation, defined as those born after 1986, represent the first generation to grow up with digital technology as an integral part of their lives (Dent, 2008 & Walkup, 2006). Prensky went on to say the ubiquitous digital environment has radically changed


Figure 1. New media and learning.

millennial generation learners (referred to as digital natives). Central to Prensky's argument is his belief that digital natives are no longer the people our educational system was designed to instruct. Prensky further argued "digital immigrant" instructors are struggling to teach "digital natives" because they assume learners are the same as they have always been, and the same methods used for/by them will work for their students now (p. 3).

Digital immigrant challenges to Prensky's views can be summarized by two beliefs regarding the sociocultural context of rapid dissemination of technology and new digital media on education systems: (1) the use of new digital media does not fundamentally change youth of the millennial generation; ergo, there is no compelling need to fundamentally change the education system; and (2) there is no comparable substitution for face-to-face affective learning; as the foundation of education systems for generations, situated socialization processes for transforming information into learning is ideally suited for developing lifelong dispositions for instilling deep professional identities and values.

This paper interprets each of these beliefs from research on human learning. A working definition of affective learning is offered below to help with understanding the interpretation of beliefs and research:

> Affective learning involves the melding of thinking and feeling in how people learn. Importance is placed on social learning environments for knowledge construction and application wherein deeper awareness and understanding of the role played by mental dispositions in how a person views, engages, and values learning can result in better understanding and use of knowledge and skills. Learning outcomes are focused on enculturation of norms, values, skillful practices, and dispositions for lifelong learning.

**Belief: New digital media does not fundamentally change youth**

Prensky's argument is vigorously challenged by some digital immigrant instructors/educators on the basis that pervasive use of new digital media is not changing the millennial generation for better when it comes to learning. The rationale for challenging Prensky's argument centers on the belief that although technology, and various forms of digital media, are significant cultural tools, they do not represent new genres of communication and media literacy involving how people perceive, think, and interact in the world.

If the ways people perceive, think and interact in the world were fundamentally changing, however, it would suggest that the proliferation and use of new media has led to the mind becoming a hybrid of biology and technology, by augmentation (see Figure 2). Interestingly, Donald (1991; 2001), Olson (1994), among others, have argued this is exactly what has already occurred in the transformation of human cognition and continues to occur in modern, literate cultures where the mind virtually employs external symbolic material as their true "working memory" (Donald, 1991, p. 329).

Olson (1994) argued that the medium in which people store, organize, use, and discourse on information alters how they ultimately understand this information. Thus, generational differences are likely to arise with genres of communication and media literacy, if youth come of age in a world where using new media enables unprecedented forms of global communication, connection, interaction, and mobility (Ito, et. al, 2008; Boddie, et. al., 2007; Kakihara & Sorensen, 2002). This does not seem far fetch when observing millennial generation youth constantly socializing via a variety of new media tools and practices involving mobile phones, multi-player gaming, storing, sharing and listening to music, peer-based learning across digital skills, watching, making, and uploading videos, instant text messaging, twittering, where they are "always-on" and connecting to friends (Ito, et. al., 2008; Klopfer, 2008).

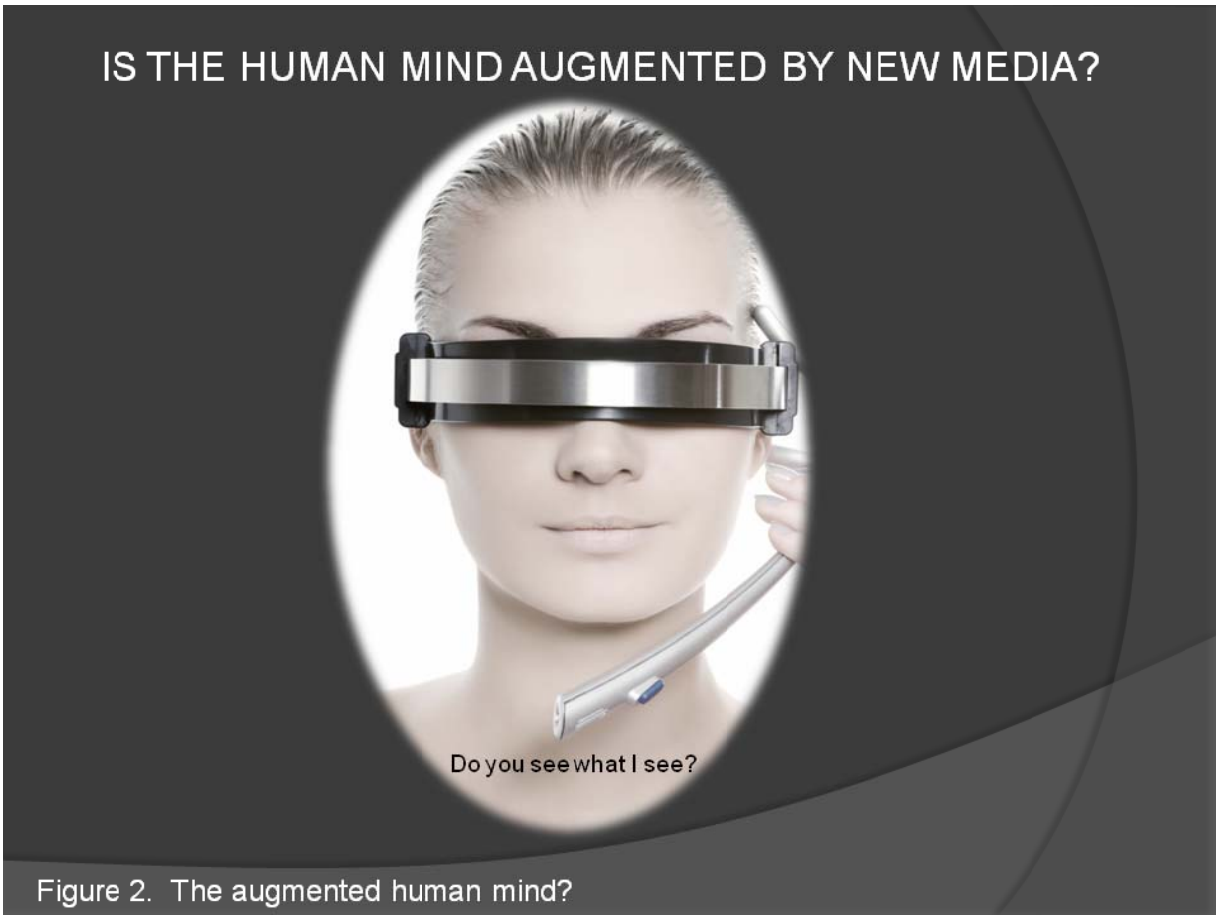

Figure 2. The augmented human mind?

Through modern technology and new digital media youth have unprecedented global reach to information resources and instantaneous, or near-instantaneous, communication with others, enabling geographic independence. Thus, "being mobile" is no longer restricted to a matter of traveling, but increasingly reflects the degree to which people can interact with information and others in new configurations of social-technical relationships independent of geographical proximity (Kakihara & Sorensen, 2002). New configurations can introduce new social consequences of mobilization for how

people learn and the mobility of the learning place itself. These new configurations are prompting some educators to rethink possibilities for expanding the meaning of a situated place for learning. Nonetheless, the degree of importance attached to having a geographic-situated place for affective learning remains relatively high for Air Force educators. Attention is now turned to the second belief.

**Belief: There is no comparable substitution for face-to-face affective learning**

Digital natives will soon become a majority in an emerging millennial generation Air Force. Questions arise about how best to shape a future Air Force wherein the majority of Airmen will be used to the instantaneity or "always on" of information access, sharing; and where learning occurs in mobile, collaboratively-driven digital "third space" (neither home, nor school/work).[1] How will existing emphasis on face-to-face affective learning in Air Force education systems fit with or support the millennial generation?

Recent white papers and studies have offered several recommendations for supporting an emerging millennial generation Air Force.[2] To date, recommendations have centered on new media digital technologies and blended learning designs to leverage advanced knowledge repository, management systems, virtual and mobile learning for enhancing training and education of a digitally-interconnected and highly mobile emerging millennial generation Airman. Interpretations of the recommendations by educators have included concerns about the near-absence of consideration for the importance and role played by face-to-face affective learning in a situated place. For some, greater emphasis on new media to support or enable further instances of geographic independence provided by mobile and distance learning can directly or indirectly, over time, devalue physical proximity between instructors and learners in a situated place wherein socialization and modeling of Air Force values and group identity, supported by affective learning, are believed to best occur. In particular, some Air Force educators believe that by observing role models in a geographic-situated place, people can acquire knowledge that they may not be readily able to demonstrate at the time of mobile and distance learning.

Modeling refers to cognitive, affective, and behavioral changes that derive from observing models (Schunk, 2001, p. 128). Models are real or symbolic individuals or characters whose behaviors, verbalizations, and nonverbal expressions are attended to by observers and serve as cues for subsequent modeling (Schunk, 1987). According to Bandura (1986), modeling can serve different functions: acquisition of new behaviors (observational learning), strengthening or weakening of behavioral inhibitions (inhibition/disinhibition), and performance of previously learned behaviors due to

[1] The concept of "third space" was suggested by Robert Godwin-Jones (2005).

[2] See published paper by Air Education and Training Command (AETC) titled, *On Learning: The Future of Air Force Education and Training* (30 Jan 2008) and Keesler Report (29 Aug 2008). Another related study is an AETC sponsored effort conducted by Mayrath, M., & O'Hare, S. (Feb 2009), *A Proposed Method for Converting Squadron Officer School into a Blended-Learning Course with Live, Virtual, and Constructive Simulations*, Institute for Advanced Technology, The University of Texas at Austin. Other AETC sponsored studies, in progress, include: RAND investigating the topic of customized learning; Air Force Research Institute's (AFRI) study on Education, Affective Learning and Technology; Air Force Scientific Advisory Board's study on Virtual Training Technologies, to name a few.

prompting (response disinhibition). Schunk (2001) further highlights that modeling serves informational and motivational functions:

> "Observing competent models perform actions that result in success conveys information to observers about the sequence of actions to use. Most social situations are structured so that the appropriateness of behaviors depends on such factors as age, gender, or status. By observing modeled behaviors and their consequences, people formulate outcome expectations, or beliefs about the likely outcomes of actions." (p. 129)

Social cognitive theory research on the importance of modeling would suggest why face-to-face affective learning in a geographic-situated place matters for the millennial generation. But, the question arises, "Is physical proximity the only suitable form of a situated place for obtaining benefits with affective learning?" To help interpret this question, a brief review is provided on the evolving understanding of the interplay between affect and place in human learning.

**What Is The Importance of Affect In Human Learning?**

The word "affect" brings to mind a wide range of meanings among educators.[3] For instance, some educators may be closer to views held by early 20th-century researchers of human behavior and learning who typically described affect as a synonym for emotion and thus not suitable for scientific study (Lazarus, 1984). Others have displayed indifference to the role of affect in learning (Brown & Farber, 1984). This indifference was largely shaped by dominance of a "stand-alone" cognitive perspective which centered on an early information processing model of the mind that rarely accounted for affect or dismissed affect as "a regrettable flaw in an otherwise perfect cognitive machine" (Scherer, 1984, p. 293). Even for the few researchers wanting to study the role of affect in learning there was little agreement on how to define the term.

The word affect became associated across a wide range of contradictory concepts and phenomena involving feelings and emotions (Owens & Maxmen, 1979). Gradually, research on affective learning helped to evolve the meaning of affect from a synonym for emotion to a deeper understanding that while emotion is an affective state, not all affective states are emotions (McLeod, 1997). Interestingly, Piaget (1962) poignantly surmised, in advance of future appreciation for affect's role in learning, "At no level, at no state, even in the adult, can we find a behavior or a state that is purely cognitive without affect nor a purely affective state without a cognitive element involved."

In the late 20th century, affect grew in importance with investigations on the ways people acquire, interpret, shape and sharpen information via thinking and affective skills (Marzano et al., 1988). A number of researchers began to explore the habitual affective ways (dispositions) people approached thinking and learning. Ultimately, insights emerged from social cognitive theory research on the role

[3] Many educators recall the Krathwohl, et. al., (1964) taxonomy of the affective domain and also highlight the challenges with assessing the affective levels.

played by several dispositions across critical, creative, and self-regulated thinking (Bandura, 1986, 1988; Bandura & Schunk, 1981; Schunk & Zimmerman, 1997; to name a few). It is worthwhile to list the explored dispositions in Table 1 below:[4]

| Table 1. Human dispositions on thinking and learning. |
|---|
| 1. Seeking clarity and precision when information is unclear. |
| 2. Trying to be well informed. |
| 3. Seeking reasons for what you believe. |
| 4. Taking into account the total situation. |
| 5. Carefully analyzing information. |
| 6. Remaining open-minded. |
| 7. Taking a position (and changing it) when the evidence is sufficient to do so. |
| 8. Showing sensitivity to the feelings, level of knowledge, and degree of sophistication of others. |
| 9. Resisting impulsivity. |
| 10. Engaging intensely in tasks even when answers or solutions are not immediately apparent. |
| 11. Pushing the limits of one's knowledge and abilities to keep improving on one's knowledge and skills. |
| 12. Generating, trusting, and maintaining one's own standards of evaluation. |
| 13. Generating new ways of viewing a situation outside the boundaries of standard conventions. |
| 14. Planning. |
| 15. Being sensitive to feedback. |
| 16. Evaluating progress. |
| 17. Making use of available resources. |

Research on the relation between cognition and affect shows strong connections relative to specific contexts or actions. The interplay between cognition and affect is also driven by the level of awareness people have regarding the role of dispositions. The term "attitude" can be used to describe long-term generalized mental positions taken by people governing actions. Allport (1935) defined attitude as "a mental or neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related" (p. 810). For example, people can form mental positions about learning in certain contexts or situations, with strong associated emotion, reflecting attitudinal evaluations of good, bad, or neutral (Idol, et. al., 1991). Thus, mental attitudes can play a large role in how a person views, engages, and values a learning context or situation. Mental attitudes are reflected by the extent the learner (McCombs, 1984, 1986):

1. Views the content as valuable,

2. Believes he or she has control over the learning task, and

3. Believes he or she has the necessary abilities for the learning task.

Self-regulation of these mental attitudes on learning is largely determined by a person's dispositions for shaping cognitive abilities and affect adaptively and appropriately for the context or action via self-

[4] The composite list, originally compiled by Idol & Jones (1991), comes from the research of Amabile (1983), Ennis (1985), Lipman, Sharp, and Oscanyan (1980), Paris & Lindauer (1982), Perkins (1984, 1985), and Raudsepp (1983).

reflection (Johnson-Laird, 1998; Sternberg, 1998).[5] We also know from research, the importance played by communities in shaping dispositions and how people learn (Lave & Wenger, 1991, pp. 91-100; Bransford, 2000; Greeno, et. al., 1996). Self-regulation of mental attitudes on learning is shaped and influenced by social interactions (Festinger, 1954; Weiner, 1985; Zimmerman, 1994, 1996, 1998, 2000).

Deeper understanding about the importance of community and social interactions on learning has grown from an appreciation developed by educators that knowledge is not a commodity to be transmitted (Bransford & Schwartz, 1999). Rather, knowledge is essentially situated and should not be separated from the contexts in which it is actively constructed and reconstructed through direct interactions, contemplative inquiry and interpretation (Brown, et. al., 1996; Lave & Wenger, 1991; Rogoff & Lave, 1984; Armon-Jones, 1986).[6] Knowledge is inherently associated with human interpretations and dependent very much on 'the point of observation' of the person and that the process of interpretation simultaneously shapes and is shaped by social reality (Berger and Luckmann, 1966; Schutz and Luckmann, 1974). We also know from research there is a close relationship between affect and social knowledge structures (Forgas, 2000).

Researchers on human learning have also developed deeper appreciation for how knowledge is embedded in context and the media allowing its expression (Bransford, et. al., 2000; Cognition and Technology Group at Vanderbilt, 1997; Kafai, 1996). This appreciation has expanded research on the deeper and ubiquitous connections between people and technology via the use of personal and cultural tools now supporting human minds, senses, and bodies.[7] Also, there is growing research interest on the symbiotic connection between human minds and digital tools making possible phenomenal capabilities via interconnected and distributed ways of knowing and learning. For example, new media digital technologies can affect learning in several fundamental ways. Electronic texts can have hypertext providing for multi-dimensional and less linear-oriented interaction between the learner and content. Through implementation of graphics, sound, animation, and streaming live-video, it is now possible to

[5] Self-reflection does not suggest a person can inspect their own thought processes in complete detail. What is accessible is an incomplete model of one's own abilities. The ability of the mind to inspect this model and then adapt thinking and dispositions is the basis of so-called metacognitive skills. For instance, a person can think about the task or social situation at hand and work out a strategy for action. When people start to think about how they are thinking and feeling it can help with improving what one is doing (see Johnson-Laird, 1988, p. 451, and Ward, et. al., 1995, pp. 19-21).

[6] It is interesting to point out the influence of existential cognition's rejection of the separability of mind from the world on the emerging understanding regarding the role played by communities on shaping the mind: the inside mind and outside world are inseparable (see Merleau-Ponty, 1962, p. 407 and McClamrock, 1995, pp. 191-193).

[7] See VaNTH ERC, Vanderbilt University, Northwestern University, University of Texas at Austin, and Health, Science and Technology at Harvard/MIT Engineering Research Center. Available: http://www.vanth.org; also see SMETE, Science, Mathematics, Engineering and Technology Education. Available: http://www.smete.org.

merge symbolic components of communication with traditional content.[8] Such capabilities give rise to new literacy requirements associated with new media. For example:

> "…some of the most successful teachers use information technology in concert with a shift in a role from lecturer to mentor of student learning through inquiry. Students are encouraged to learn by finding information about assigned subjects and then to piece together the information in some well-structured way that can be reported and discussed with the class. In this way, the student actively constructs an ordered view of the information in his or her mind that tends to be remembered and understood better than information absorbed through passive listening. The teacher's role here is to structure the sequence of assignments, help the student find and understand the information, help the student piece the information together, perhaps establishing a larger context, promote discussion, evaluate results, and redirect as needed. In some cases, teachers have built Web sites for students to explore, often with links to outside materials. Such student inquiries are often conducted in collaborative groups. The learning skills developed by these students form a basis for independent lifelong learning."[9]

New media literacy involving the global extension of the boundaries of mental, sensorial, and corporal connections, made possible and supported via mobile and interconnected digital tools, is prompting educators to consider that the relationship between new media, affective learning and situated place is anything but simple.

**What Is The Importance of Place In Human Learning?**

Most Air Force educators would not deny benefits for having a situated place for learning in context, wherein learners can engage in face-to-face interactions and share feelings, emotions, experiences, and mental models with peers and instructors. Likewise, there's common concern for distance learners, whether they are a digital native or immigrant, to fully benefit from interaction with peers and instructors in the absence of place. Lehman (2006), however, described ways to establish instructor and learner presence (sense of being there) in the distance education experience by specifically addressing the close interactions between cognitive, affective, and motivational processes. In this paper, place,

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[8] See Langer, A. M., & Knefelkamp, L. L. (Nov, 2001). *Forms of literacy development with technology in the college years: A scheme for students, faculty, and institutions of higher learning*. Paper presented at the Association of American Colleges and Universities (AACU) Conference on Technology, Learning, & Intellectual Development, Baltimore, p. 10. The authors cite research by Reinking, D. (1994), Electronic literacy, Perspectives in Reading Research (4), (ERIC Document Reproduction Service No. ED 427 780).

[9] See President's Information Technology Advisory Committee, Panel on Transforming Learning (Feb, 2001). *Report to the President: Using information technology to transform the way we learn*, p. 9.

rather than presence, is used to denote a stronger sense of "being there." This concept of place still includes the importance of instructor and learner presence, but the sense of "being there" is situated in a community of learners, supported by visual/auditory/bodily movement-related sociocultural cues operating in a natural ecosystem context serving to help anchor experiential social learning experiences. Such a place provides the context for community socialization activities involved with converting new knowledge into deeper understanding, affective value and application through shared language, norms, feelings, emotions, and experiences (Bateman, et. al., 1998).[10]

The importance of place has been central to socialization activities in learning for centuries. A quintessential example of the significance of socialization in learning, via a shared-situated place, can be found in apprenticeship guild practices whereby novices were guided into becoming masters by observing, imitating, and practicing the application of knowledge with others in the guild. Harvesting benefits from socialization activities in learning depended on physical proximity. Physical proximity is still considered ideal by many digital immigrant educators for helping learners to reach higher levels of understanding and practice particularly when identifying with and committing to sociocultural group values, norms and behaviors are also targeted learning outcomes. The "guild" model, with emphasis on a shared-situated place for mentoring, has been used for centuries to design and establish environments purposefully-designed to support face-to-face learning in line with sociocultural norms and values of the founding group (Lave, 1977).

Within a shared-situated place a learning ecosystem can operate to connect the minds of educators with learners and learners with one another through face-to-face communication and social interactions. The social interactivity of people in the learning ecosystem is largely bounded by the communication and memory technologies offered by situated places (e.g., classrooms, libraries, laboratories, offices, etc.).

The concept of a learning ecosystem used in this paper is based on a social theory of learning which places importance on a sociocultural environment, involving a community of learners, with emphasis on an education experience to provide society with competent citizens and productive workers.[11] This theory is counter to the growing tendency to look on education as merely a private good, the primary purpose of which is to enhance the competitive social position of the degree holder and emphasis is placed on the private benefits of education for the individual (Labaree, 2000, p. 112).

[10] The reader is referred to the work of Cummins (1998) for an overview of research on the interplay between physical and social environments.

[11] See Wenger (1998) for a summary of issues involving the individual and the collective in a social theory of learning (pp. 145-148). Also, the reader is referred to the Laboratory of Comparative Human Cognition (1988) for a description of the eco-cultural theory for helping to account for the role of socialization practices in learning, pp. 642-719. Vygotsky (1962) also highlighted the social origins of cognition. Gardner (1993) also addressed the relevance and importance of interpersonal and intrapersonal intelligence. Interpersonal intelligence allows one to understand and work with others; intrapersonal intelligence allows one to understand and work with oneself (p. 25).

The distributed nature of learning, among members of the learning community, is supported by a common network-level language of communication operating in the sociocultural environment of the ecosystem to mediate transactions (e.g., roles, privileges, accessibility, performance expectations, behavioral norms, conflict resolution, negotiations, to name a few)(Lucariello, et. al., 2004 & Nelson, 1996). It is the cultural ecosystem of the learning community which makes mediated and purpose-driven communication and social interactions possible; and operates, in the minds of its members, as a distributed virtual operating system used for enculturation of values, learning, and skillful practices.[12] Learners should participate in communities of practitioners since the mastery of knowledge and skill requires movement towards full participation in the sociocultural practices of a community (Lave and Wenger, 2002, p. 29). Thus, most educators are likely to place high value on the importance of a situated place, whether geographic-centered or otherwise, wherein purposefully-designed formal communications, memory technologies, and social interactions can effectively operate in a supportive sociocultural environment for contributing to the learners' developing mind and lifelong mental attitudes towards learning.

**Immersive Virtual Reality: Surrogate for Geographic-Centered Situated Place?**

Meredith Bricken (1991) and Hilary McLellan (1991) argued immersive virtual reality can be very supportive of situated and constructivist learning.[13] Immersive virtual reality provides the means for a person to enter a virtual spatial multi-sensory environment and embody it in such a way as to actively inhabit, interact, and create the next event (Bailenson, et. al., 2008 and Walser, 1992).

According to Bricken (1991) immersive virtual reality learning environments can be designed to be experiential and intuitive; providing learners with control over time, scale, and physics for a shared experience and information context supporting interactive hands-on learning, group projects and discussions, field trips, simulations, concept visualization, and to observe from many perspectives. Prototypes of immersive virtual reality learning environments, constructed by Air University researchers and learners for assessing differences between classical and future designs, are illustrated in Figures 3 and 4 below.[14]

[12] The original idea of a cultural ecosystem as a distributed virtual operating system is from the work of Donald (2001).

[13] In the late 1980s Jaron Lanier first coined the term "virtual reality" to describe interactive computer-generated three-dimensional immersive displays (Lanier, 2001; Schroeder, 1996, p. 23; Rheingold, 1991, pp. 15-16). Much progress has occurred since the first commercially-available multiparticipant or multiuser virtual reality (VR) system was introduced by Jaron Lanier's "Reality Built For Two" or RB2 (McLellan, 2004).

[14] The reader can visit the illustrated prototype designs, constructed in Second Life by Air University, at http://slurl.com/secondlife/Huffman%20Prairie/128/128/27. Also, videos of the designs can be seen at http://www.screencast.com/t/QBt6u3uyTjX. Second Life is a virtual 3D environment available to the public via the Internet at http://secondlife.com.

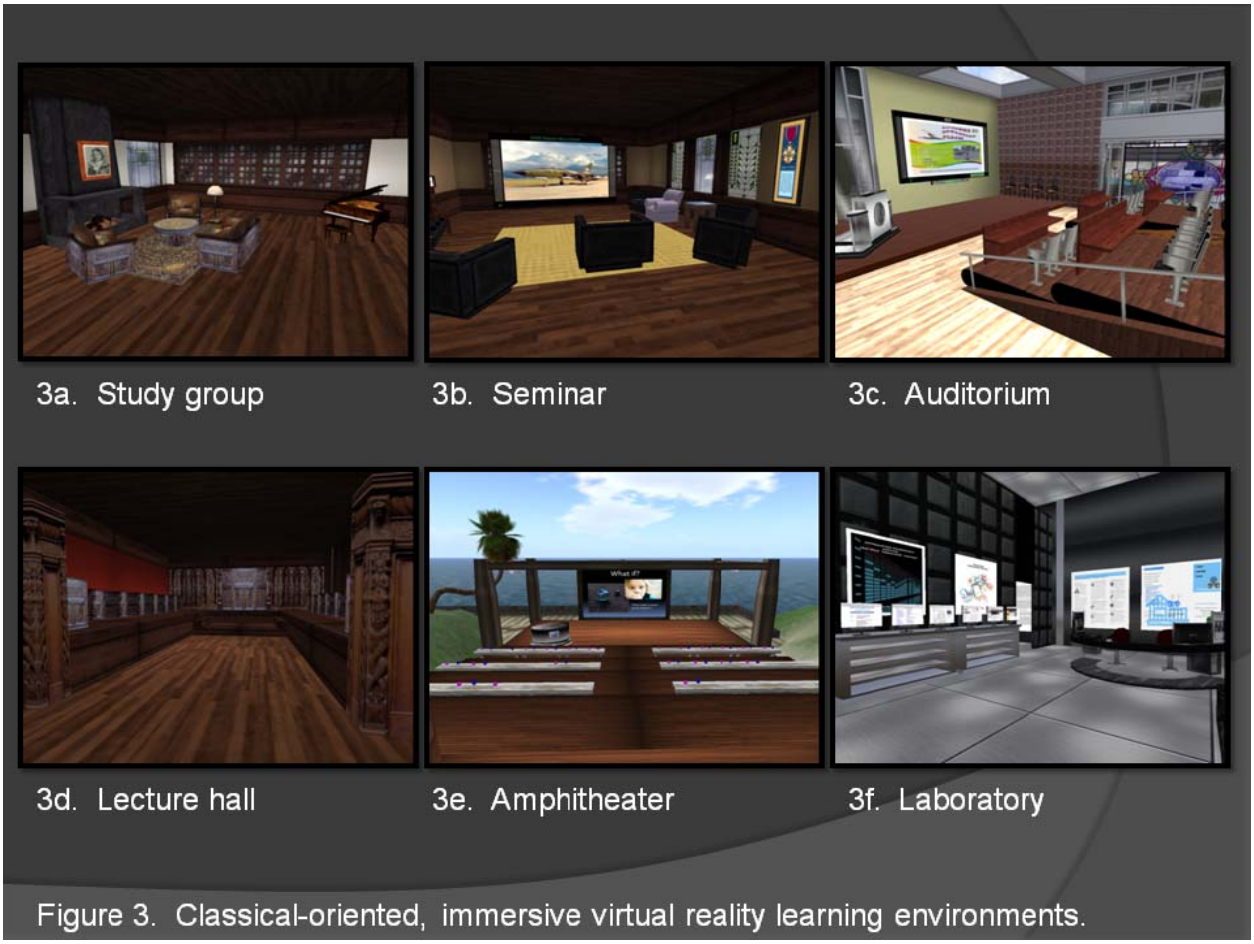


Figure 3. Classical-oriented, immersive virtual reality learning environments.

The immersive virtual reality images, shown in Figure 3 above, depict classical-oriented, learning environment designs. Recognizable visual cues of social roles for instructors and learners, interactive learning tools (e.g., virtual computers, plasma screens, and books), auditory features, help to establish a sense of a situated place supporting classical learning environments. Digital immigrant learners are more likely to recognize and accept the validity of the above designs as suitable places for situated learning. Various future-oriented, immersive virtual reality learning environment designs are shown in Figure 4. Image 4a depicts a hologram arena wherein learners can select from multiple learning environment options and have them instantaneously appear (or "rez") for use. Hologram examples include interactive villages, depicting various world-wide locations, used for supporting language and culture courses. Several arenas are also provided for learners to create 3D objects for hologram constructions. Image 4b shows a machinima (machine cinema) studio environment for creating, editing, and showing animations using virtual equipment. The interactive museum (Image 4c) provides learners with "step-in-experience" displays. For example, learners can experience a virtual flight of the Tuskegee Airman P-51 Mustang. More extensive "step-in-experiences" are provided by excursion trips. In the excursion trip example depicted in Image 4d learners can travel to Mars by first taking a multistage rocket to a space station for transition to a deep-space travel vehicle. Upon entering the orbit around Mars, the learners are then taken to a surface station via a landing craft. Throughout the trip, learners

are interactively engaged with challenges associated with space travel and research. A multi-player non-linear simulation game environment, involving the use of a scenario-based learning framework for engaging learners with real-life challenges is shown in Image 4e. A game kit for educators has been developed to support the creation of games for learning within virtual worlds (Stricker & Clemons, 2009; Hughes & Stricker, 2009). A situated virtual Air Force base (MyBase) is depicted in Image 4f. Visitors can enter MyBase and immerse into various Air Force roles (e.g., military recruit/trainee, chaplain, pilot, physician, etc.) in support of multimodal experiential learning in the context of an Air Force community. Interestingly, while some digital immigrant educators visiting the future designs have reported cognitive dissonance and question the validity or utility of the environments as suitable places for situated learning, others have reported insights about the "art-of-the-possible" with prospects of virtual worlds for supporting learning, instruction, and discovery. Educators are drawn to the affordances or opportunities for action (learn by doing), bundled together with learning tools and devices, offered by the future designs. Also, educators are drawn to the surrogate settings of actual work environments supporting apprenticeship, collaborative teamwork, coaching, and monitored performance feedback.

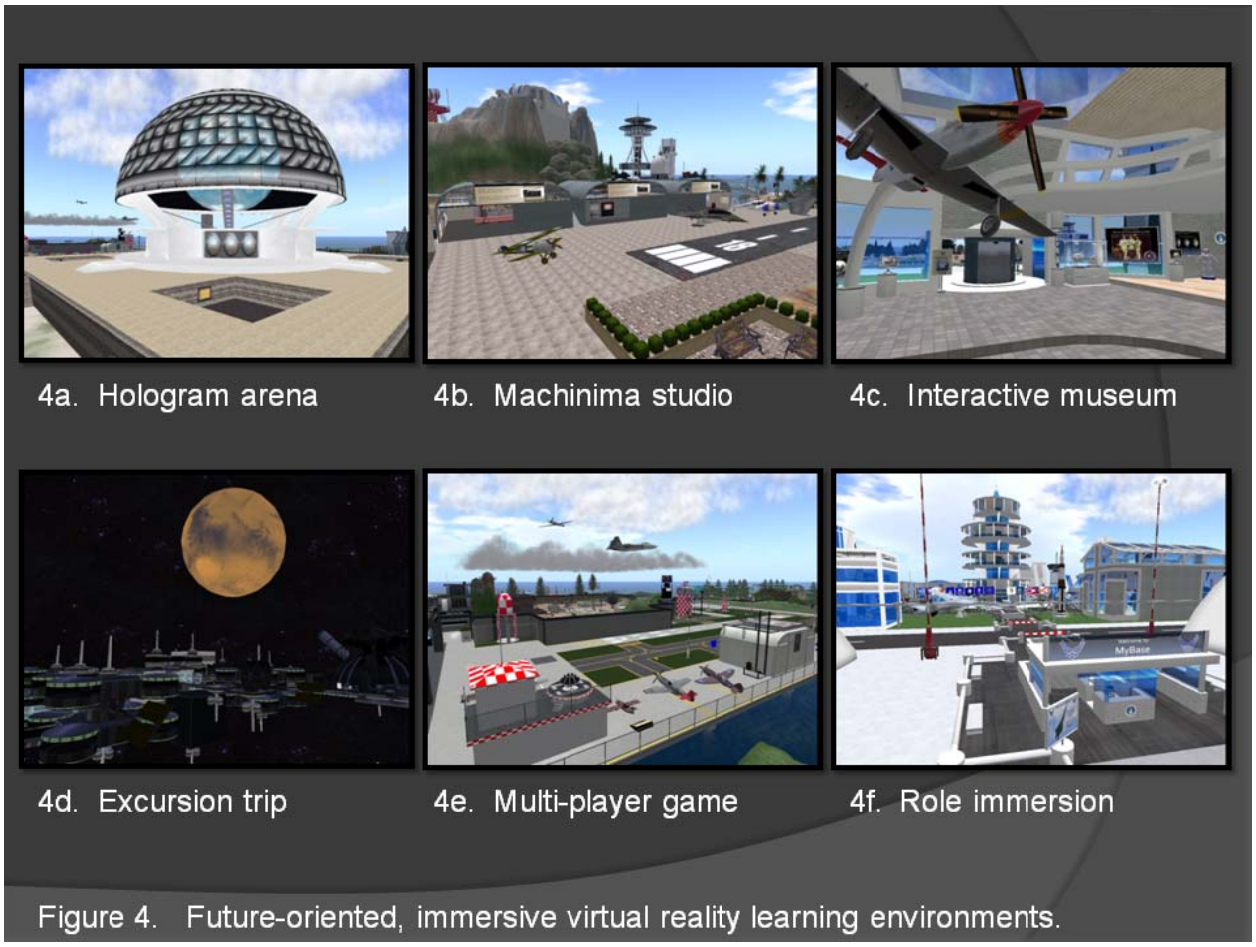


Figure 4. Future-oriented, immersive virtual reality learning environments.

**A Generalized Interpretation of the Research**

Many digital immigrant educators are members of an "in-school" socioculture associated with formal learning ecosystems. The sociocultural context and practices of educators in formal learning ecosystems can be misunderstood, and perhaps undervalued at first glance, by overly interpreting the need to radically change education systems to better support how the millennial generation learns with new media. Nonetheless, the immersive virtual reality learning environment research, conducted by Air University, suggests assistance may be necessary to help educators transition between classical- and future-oriented learning environment designs. The need for assistance, however, does not minimize the importance served by educators for establishing and facilitating viable learning ecosystems within future-oriented virtual reality learning environments. While it may be true that digital natives have grown up with new media technology as an integral part of their lives, it does not necessarily follow that millennial generation youth know how to learn well with new media nor is there inherent higher forms of literacy associated with the social-ethical responsibilities of its use (Langer, A. M., & Knefelkamp, 2001; and Langer, 2005).

The sociocultural context and practices of educators have evolved, over centuries, to maximize benefits from contemplative inquiry defined by the intermittent nature of how knowledge is constructed and interpreted for reliability and validity for inclusion, shared use, and communication. The socioculture context and practices of educators support predictable and systematized ways to enhance social knowledge structures and communication from a geographic-situated place (see Figure 5).

Many educators attribute their development, and lifelong dispositions towards learning, to an epistemology associated with value placed on affective connections between instruction and learning. And equally true, from nearly the inception of formal learning ecosystems, some form of technology (e.g., printing of books) has been used as an augmented tool in service to the human mind.[15] Considerable effort is expended to enhance technology, generation by generation, largely because the human mind has been extraordinarily successful in going

[15] Modern day examples can be found with Internet-connected digital devices enabling people to search all of human knowledge. Via the Internet, people can access knowledge in digital collections created by traditional libraries, museums, archives, universities, government agencies, specialized organizations, and even individuals around the world. Very high-speed networks enable groups of digital library users to work collaboratively, communicate with each other about their findings, and use simulation environments, remote scientific instruments, and streaming audio and video. With these capabilities no classroom, group, or person is ever isolated from the world's greatest knowledge resources (President's Information Technology Advisory Committee, Panel on Digital Libraries, p. 1)

beyond the biological limitations of any single brain to better evolve and transmit culture across generations using augmentation tools to construct, connect, and communicate.[16]

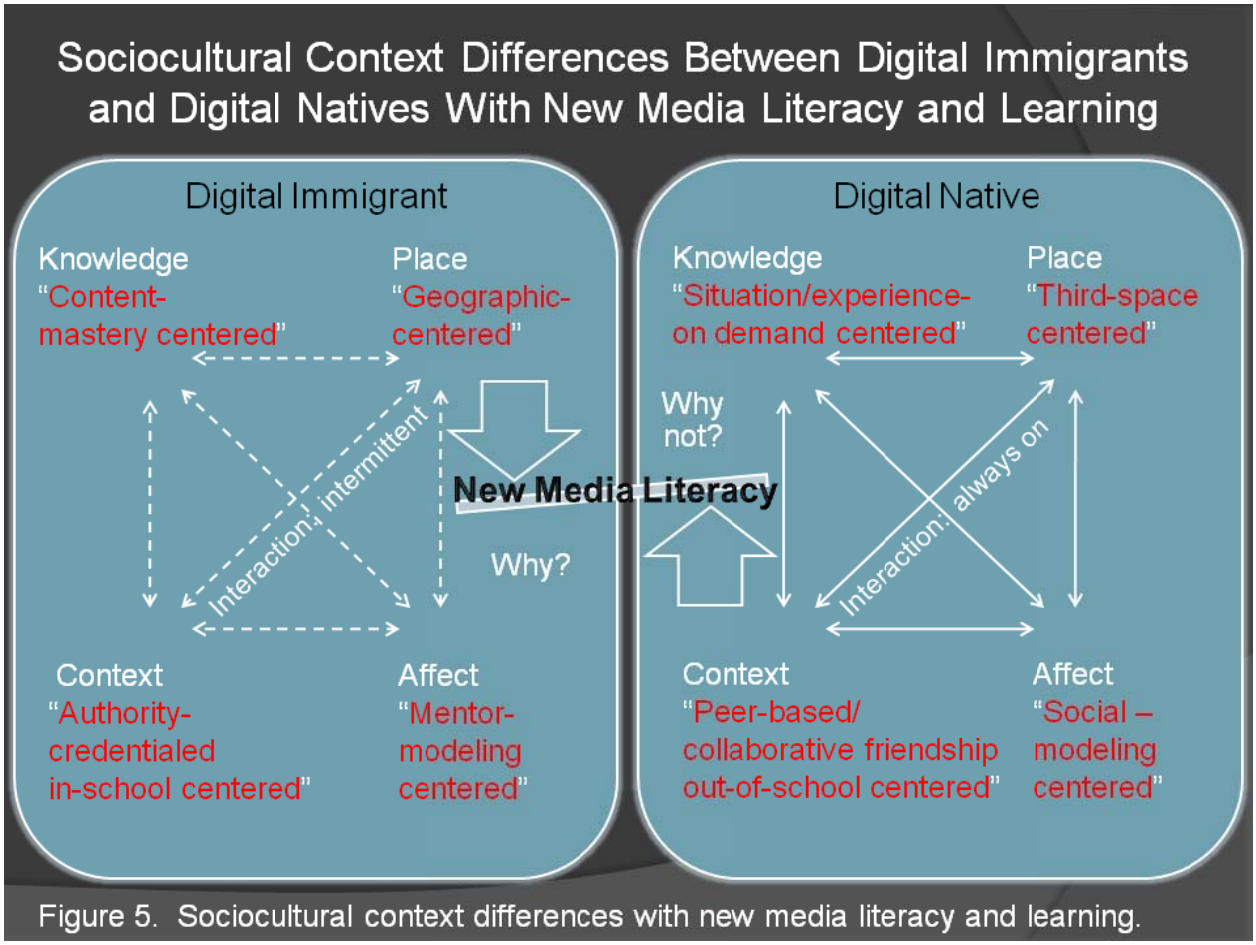


Figure 5. Sociocultural context differences with new media literacy and learning.

The mind's desire to construct knowledge, to connect with other social constructions for forming better and larger or more complete insight, are fundamental to the nature of learning ecosystems whether they are formal or informal. Thus, on the one hand, most educators associated with formal learning ecosystems do not dismiss the value of informal "out-of-school" learning ecosystems and the sociocultural context involving the use of new media by digital natives. On the other hand, most educators also believe affective learning in a situated place matters, facilitated by mentored-modeling, for enculturation of skillful practices, lifelong dispositions and values. That being said, there is also recognition of the inherent constraints associated with limited accessibility to geographic-situated places for learning.

[16] The reader is referred to Veltman, K. (2006), for an in-depth review on the ways new media contributes to new forms of collaboration and distributed systems supporting access to knowledge that is enduring.

Typically, the benefit of physical proximity is limited by availability of space and resources. Interestingly, these constraints are driving up interest among educators to explore the use of virtual worlds, particularly if the immersive social knowledge structure can be designed and supported well enough to offer the best qualities associated with affective learning in a situated place.[17] Virtual worlds are primarily about creating a spatial environment in which people interact with other people in real time—they are in a concurrent space…and changes made will persist after they leave the environment (Prentice, et. al., 2009, p. 5.). Prentice also reports that by year-end 2011, 80% of heavy Internet users will have a presence in one or more virtual worlds (p. 5.).

Beyond prospects of virtual worlds for providing geographic independence of a suitable situated place for affective learning, there is little doubt new media is fundamentally altering the literacy experience in learning, instruction, and discovery (Homer, 2004). Importantly too, even though new media is altering the literacy experience of digital immigrants and natives, discussion of new media literacy has helped invigorate educators to share why affective learning in a situated place matters for the millennial generation.

**Summary**

The growing interconnectivity and interdependencies between new media literacy, knowledge, place, affect, and context, can impact how well social knowledge structures, employed by formal learning ecosystems, support learning by the millennial generation. It is generally recognized that a formal learning ecosystem, such as a university, is composed of reciprocal or ecological relationships that influence one another. For instance, new media, instructor and learner interactions shape the sociocultural context of the learning ecosystem, which in turn produces reciprocating qualities effecting change in each. Likewise, new media introduces unprecedented reciprocity arising from global communication, connection, interaction, and mobility.

In the case of advanced new media technologies, such as found in the visualization of complex systems, there is growing recognition that new ways of understanding complexity, creating, and sharing knowledge constructions are emerging only because technology makes it possible. Nonetheless, most educators, for good reasons, advise against technocentrism and its tendency towards breaking down important affect and social interactions in a situated place, all of which are critically important with human learning. Increasingly, however, educators also accept the importance of addressing new media literacy and leveraging new ways learners can construct meaning, connect, and communicate.

New media is fundamentally transforming not only how the millennial generation learns but also how people will learn using social knowledge systems for generations to come. The understanding

[17] This is particularly true if emotional and cognitive activities are significantly mediated in a virtual world environment supporting the perception of opportunities for acting and the means for acting involving the modalities by which people interact (e.g., locating, tracking, identifying, grasping, moving, and modifying objects) (Allen, et. al., 2004; Bricken, 1991).

of this phenomenon, including individual and institutional efficacy to thrive with new media, is in itself, an emerging new form of literacy to grasp and harness for the 21st century.

**Disclaimer**

The opinions and viewpoints expressed in this paper are solely those of the author and do not reflect official policy or position of the US government or the Department of Defense (DoD), the United States Air Force, or Air University. Cleared for public release (AETC-2009-0360).

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