

4-1-2011

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### Recommended Citation

Rahim, Emad and Finch, Aikyna (2011) "Adult Learning Styles and Technology-Driven Learning for Online Students," *Academic Leadership: The Online Journal*: Vol. 9: Iss. 2, Article 5.

DOI: 10.58809/TAW9583

Available at: <https://scholars.fhsu.edu/alj/vol9/iss2/5>

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# Academic Leadership Journal

## Adult Learning Styles and Technology-Driven Learning for Online Students

Issues: [Spring 2011 - Volume 9 Issue 2](#)

Posted On 2011-06-09 10:35:00

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### Introduction

The growing crisis in the U.S. has caused many traditional colleges and universities to consider new ways to ensure economic competitiveness and continued financial growth without increasing the size and overhead of their campus.. Universities like Upper Iowa, University Bates College in Maine, and Ball State University in Indiana have begun to offer three-year undergraduate degrees and provide online courses to save students both time and money (Pope, 2009). Several colleges in Colorado are considering the option of moving from a traditional undergraduate classroom format to adding online courses as a means to raise revenue and increase student enrollment. Because learning styles and technology utilization are areas of high interest, it is essential to conduct an analysis of adult learning theory and teaching styles. This paper examines relevant literature to understand the connections and differences between adult learning styles and teaching styles in traditional classrooms and in online classrooms. By exploring these phenomena, we will shed light on successful methods and approaches that can influence best practices for online instruction.

Emerging trends in traditional higher education support this growing demand for online college degree programs. The following data highlight the urgency we are seeing in the restructuring of traditional degree-offering and learning platforms:

- Senior administrative officials at the University of Tennessee are recommending abolishing roughly 800 positions, increasing tuition and eliminating academic programs to counteract waning state revenues due to the fledgling U.S. economy (Mansfield, 2009).
- Northeastern Louisiana's three academic institutions are planning to cut 255 jobs and reduce more than \$21 million from their budgets next year, also due to the economic crisis that has caused the state to have a projected \$1.4 billion budget deficit (Hillburn, 2009).
- The University of Washington eradicated 1,000 employee positions in 2009 in response to anticipated severe higher education budget cuts from the state legislature, which is facing a \$9 billion state budget shortfall (Easton, 2009).
- Wellesley College is cutting its workforce by 80 employees to save money as it becomes the latest institution of higher education forced to make momentous budget cuts (Terris, 2009).

Since about 1970 it has been a common trend for traditional colleges and universities to recruit adult

learners. In 1972, the Commission on Non-traditional Study asked the Center for Research and Development in Higher Education at the University of California at Berkeley to survey two- and four-year colleges and universities concerning the education of adults that work (Ruyle and Geiselman, 1974). At that time, between 1,000 and 1,400 American colleges and universities offered degree programs that were considered “nontraditional” in the sense that they served adult learners through evening or correspondence learning courses. The study provided interesting data on the growth in lifelong learning. According to the results of the study, 7% of the programs were more than 10 years old, which provides some early evidence that colleges and universities are altering the nature and delivery of traditional programs to appeal to and serve adult students.

According to Steinbech (2000), consideration of learning styles has always been critically important to teaching and learning. Similarly, researching learning styles of adults in the context of a technology-driven learning community can provide awareness of what has to occur to make the learning experience comprehensive and rich for adult students. Knowledge of compatible learning and teaching styles is essential to the development of course content, teaching approaches, and learning assessments. Administrators, faculty members, and course developers who shape adult learning styles can influence knowledge acquisition, transfer, and application when teaching adult students (Steinbech, 2000).

Developing an understanding of adult learning styles is important in face-to-face classrooms in general, but using technology to deliver course content online adds another dimension and challenge to student success. Mackeracher (2003) outlined that students grasp and retain information more effectively and efficiently when they are taught with methods that match their preferred learning styles. Through the use of particular teaching methodologies geared toward the specific learning styles of adults enrolled in online technology-driven courses, it may be possible to enhance the learning experiences of adult students. Developing staff, faculty, and organizational dexterity in understanding adult learning styles is critical for colleges and universities that are moving from serving traditional-age college students to working adult students (Mackeracher, 2003).

Working adult students or adult learners are not characterized by age but are identified by adult learner traits: self motivation, curiosity about learning, extensive work and life experiences, critical thinking skills, the aptitude to learn in groups, the capability to engage in reflection and introspection, the capacity to engage in self-directed learning, and the ability to articulate and apply their perspectives and experiences to course content. These characteristics make teaching them both challenging and unique (Wynn, 2006). Adult learners share similar personas; they approach their learning with dissimilar backgrounds and levels of preparedness (Diaz and Cartnal, 1999). In addition, adults connect to their learning experiences based on their learning preferences and learning styles (Diaz and Cartnal, 1999; Claxton and Murrell, 1987). These learning traits make it difficult for adult learners to study in a traditional educational setting. This is why the technology-driven online course atmosphere was designed to be adaptable (Buckle and Smith, 2007).

The question is: when is the right time to transition from the teaching of the traditional school to the technology atmosphere of the corporate world? According to Diaz and Cartnal (1999), a successful transformation from a traditional classroom-based learning community for recent high school graduates to a technology-driven learning community offering online courses to working adults is critical. Such a transformation is needed to understand the range of variables and teaching methods adult students

need to be engaged and connected.

As faculty and curriculum developers move from traditional face-to-face classrooms to technologically driven online classroom delivery methods, they must pay considerable attention to community teaching and instructional approaches. Gee (1990) outlined that several studies have supported that student engagement and success is positively influenced when teaching approaches are geared toward preferred learning styles.

## Literature Review

Learning style is described by Merriam and Caffarella (1991) as an “individual’s characteristic ways of processing information, feeling, and behaving in a learning situation” (p. 176). Diaz and Cartnal (1999) asserted that a learning style is a student’s preferred way of absorbing and understanding new information: “It does not have anything to do with how intelligent you are or what skills you possess; it had to do with how your brain works most effectively to learn new information” (p. 130). In brief, a student’s learning style is determined by the means in which new data attainment is maximized, retained, and comprehended most successfully (James and Gardner, 1995, p.21). Knowing the learning style of the adult learner and adapting the material accordingly will bring forth ultimate understanding.

## Adult Learning

One of the most influential theorists on adult learning is Malcolm Knowles, who developed the concept called andragogy. His conceptual framework distinguishes the key differences between how adults learn and how children learn. His theory of andragogy could be defined as the proficiency and discipline of how adults learn; it can be contrasted with pedagogy, which considers how children learn (Knowles, 1984).

According to Knowles (1984), in the pedagogic model, teachers presuppose the duty for making decisions concerning what will be learned, the method used for learning, and the timing of the learning process. Under this approach, teachers tightly control all aspects and variables of the learning process. Pedagogy is considered teacher-directed instruction, which places the student in a docile position necessitating deference to the teacher’s directives. This method for teaching children assumes that students’ minds are like an empty pitcher into which the teacher pours knowledge and information. The result is a teaching and learning state of affairs that keenly endorses heavy reliance and dependency on the teacher. In many ways the pedagogical model does not work well for teaching adults (Knowles, 1984, p. 43).

According to Knowles (1984), andragogy is based on a number of beliefs about adult learners:

1. As a person matures, his or her self concept moves from that of a dependent personality toward one of an independent and self-directed person.
2. An adult’s collective life and professional experiences are a rich resource for knowledge transfer and learning.
3. The motivations and readiness of an adult to learn are closely related to developmental tasks that include successes and lessons learned from his or her social role.
4. There is a change in time perspective in learning as people evolve and mature in the manner that

newly gained knowledge and theory can have the ability to be immediately applied in real world problem solving and analysis (Knowles, 1984, pp. 44-45).

5. The most powerful motivations for learning and the desire for knowledge acquisition are internal rather than external (Knowles, 1984).

6. Adults need to understand the applicability and practicality of why they need to learn something (Knowles, 1984).

In a similar vein to Knowles, John Sperling (1989) outlined important theories about how adults learn in relation to younger students and used these principles to develop and create the University of Phoenix. His premise is based on the belief that at traditional universities all knowledge is assumed to reside with the professor, whose job is to transmit it to the passive and inexperienced students. This traditional form of teaching consists of a faculty lecture where students take notes to prepare for exams where the students are expected to regurgitate back to the professors his/her own words on an exam as a determination of the student's learning (Sperling, 1989, p. 73). While this method may be acceptable for youthful students with little professional experience, it frustrates and hampers the motivation of working adult students because the method discounts the knowledge and experience that they can add to the discussion (Sperling, 1989, p. 73).

Because of their broad professional work experience, adult learners react with frustration or boredom or antagonism to teachers that have spent their academic lives in a professional cocoon of just being on campus, doing research, and not working professionally in the fields that they teach in. Knowing little of the related professional activities in the professional practice world beyond the campus walls, and lacking real world reference points, faculty present knowledge of their discipline in an academic vacuum; what is being taught frequently has no application to what is happening in the working world. Applied knowledge is not viewed as important as theoretical knowledge, and there is no requirement to apply theoretical knowledge to the world beyond the academy. Rather than viewing the academic disciplines as tools to solve practical, interdisciplinary problems, professors view mastery of a discipline as an end in itself (Sperling, 1989, p. 73).

Kemp, Morrison, and Ross (1998) noted that the andragogical model of instruction is heavily focused on presenting methods for assisting students with the acquisition and retention of new knowledge and skills. In this mode, the teacher arranges a set of activities for engaging students with strategies that include establishing a community favorable to learning; devising content that will facilitate education; crafting a blueprint of learning experiences; performing these learning occurrences with appropriate procedures and content; and appraising the accomplishment of learning results and revising approaches as necessary. According to Gibson (1998) a prominent factor in teaching successfully online for adults is making sure that "the learner is in charge of what gets learned" (p. 65).

### Advanced Adult Learning Style Theories

Learning styles are so assorted that no solitary theory can sufficiently tackle the diverse perspective adults bring to a learning community. However, this has not prevented theorists from offering their own perspectives to the discussions about the nature and nuances of adult learning styles.

#### Kolb

Kolb (1985) provided a framework in accordance with four categories of adult learning styles:

convergers, divergers, assimilators, and accommodators. Convergers collect knowledge by thinking and evaluating and then practically applying new ideas and perspectives. The aptitude to practically apply fresh concepts is this learner's maximum competence. Convergers classify data through hypothetical deductive and logical-oriented interpretation (Kolb, 1985).

Divergers acquire new data via their own insight and intuition. Individuals with this chosen style of learning draw upon their imaginative competence and their aptitude to observe multifaceted circumstances from a mixture of vantage points and contexts. Divergers also enjoy the ability to effectively amalgamate information into coupled contexts. Their imaginative talent is their utmost learning proficiency (Kolb, 1985).

Assimilators possess significant capacity to construct theoretical models and critically think inductively. They learn most effectively by thinking, assessing, reflecting, and planning. Assimilators focus chiefly on the expansion of constructs and theories to a spot that often ignores facts that contradict the foundations of those theories and constructs (Kolb, 1985).

Accommodators, unlike assimilators, cast off constructs and theories if the facts do not match. These learners do exceptionally well in scenarios where they have to apply constructs to a specific state of affairs. Their peak strength is their ability to complete tasks and to become fully involved in fresh occurrences. Accommodators approach problems in an intuitive, trial-and-error manner, and they obtain information from others rather than from their own critical assessment capabilities (Kolb, 1985).

Kolb's learning model sets out four distinct styles which are based on a four-stage learning cycle that offers a way to understand different learning styles. He believed that the four-stage cycle of learning was a central principle of his experiential learning model. In this cycle the learner goes through the following four stages: experiencing, reflecting, thinking, and acting. Each of the stages depends on the next to achieve the optimum experience (Kolb, 1985).

Kolb's (1985) model therefore works on two levels

A four-stage cycle:

1. Concrete Experience – (CE)
2. Reflective Observation – (RO)
3. Abstract Conceptualization – (AC)
4. Active Experimentation – (AE)

A four-type definition of learning styles:

1. Diverging (CE/RO)
2. Assimilating (AC/RO)
3. Converging (AC/AE)
4. Accommodating (CE/AE)

## Dunn and Dunn

This is a learning model based on environmental preferences that are necessary to produce optimum retention for the learner. Rita and Kenneth Dunn developed the Dunn and Dunn Learning Style Model in 1978. It consists of 21 elements compiled into five strands that affect each individual's learning:

1. Environmental – Light, Sound, Temperature, Design
2. Emotional – Motivation, Persistence, Responsibility, Structure
3. Sociological – Self, Pair, Peer, Team, Adult
4. Physiological – Perceptual, Intake, Time, Mobility
5. Psychological – Global, Analytic, Hemispheric, Impulsive, Reflective

Each of the elements come together to create the optimum learning environment. Because every learner is different, each of these strands addresses the separate needs that must be met to achieve optimum retention. Once the adult learner and the instructor are aware of the needs, they can come up with a plan to adapt the material if necessary.

The Dunn and Dunn learning model is administered on two different levels:

1. K-12 Students – Dunn and Dunn Learning Styles Inventory
2. Adult Students – Productivity Environmental Preference Survey

## Gregorc

The Mind Styles model was developed by Anthony Gregorc (1982). Based on research of brain hemispheres, it states that the adult learners have two perceptual qualities (concrete and abstract) and two ordering abilities (random and sequential). There are four combinations of perceptual qualities and ordering abilities based on dominance:

1. Concrete Sequential – The learner prefers hands-on instruction and real-life examples
2. Abstract Random – The learner prefers visual instruction and reflection time.
3. Abstract Sequential – The learner prefers verbal method and well organized material.
4. Concrete Random – The learner prefers trial and error and needs stimulation.

The assessment tool, the Gregorc Style Delineator, identifies the mediation abilities that develop into the individual's learning style (Gregorc, 1982). The tool uses a word matrix that is ranked and calculated for each learning style. A score of 27 or more concludes that the adult learner is dominant in that particular learning style (Sadowski, Birchman, and Harris, 2006).

## Myers-Briggs

The Myers-Briggs personality indicator is based on Carl Jung's learning model. This indicator has been used in educational settings to find the best instructional fit for the adult learner. The results of the

indicator are broken down into four personality stages and each stage is broken down into two opposites to create one of 16 combinations (Baron, 1998).

The Myers-Briggs stages are as follows:

**E**xtraversion      **I**ntroversion

**S**ensing      **iN**tuition

**T**hinking      **F**eeling

**J**udging      **P**erceiving

The Myers-Briggs combinations are as follows:

ISTJ

ISFJ

INFJ

INTJ

ISTP

ISFP

INFP

INTP

ESTP

ESFP

ENFP

ENTP

ESTJ

ESFJ

ENFJ

ENTJ

The way that the adult learner rates on the stages of Myers-Briggs will determine how they will react in the world. Educators are encouraged to tailor the delivery of the material to the student's identifier because learning will be halted if the delivery is not compatible (Baron, 1998).

Aslanian and Brickell (1980) outlined that adults do not learn for learning's sake, but they do so in order to adapt to change and to be more competitive professionally. The more life-changing events that adults encounter, the more motivated they are to seek new learning experiences.

Keefe (1989) outlined adult learning styles into four distinct categories: cognitive styles, affective styles, physiological styles, and interpersonal styles. Cognitive styles relate to receiving, forming, and retaining information. Affective styles refer to attention and motives for learning. Physiological styles refer to learning behaviors related to physical or physiological factors. Interpersonal styles refer to learning behaviors related to social or relational variables. All of these categories contribute to the learning



styles of adults in their own respective areas.

## Distance Learning

Distance learning has become more common for adult learners as a tool to address the diversity and constraints of adult learners. Because of the lack of face-to-face interaction, there are certain teaching and learning variables that must always be considered (Rybarczyk, 2007). It is important to be clear when it comes to distance learning due to the fact that environment is often driven by self-directed and self-motivated learners (Dobrovolsky, 2006). Self-directed learning (SDL) occurs when the adult learner directs his or her own learning. It is the goal of SDL to allow students to charter the accomplishment of some of their own personal learning outcome objectives (Dyner, Cate, and Rhee, 2008).

While technology provides the platform for online discussion, to get full benefit of distance learning adult students require engagement in exercises and activities that appeal to their learning preferences and are relevant to their experiences. According to Gulati (2008), adult learners differ in their approach to learning.

Practical learning experiences rate high in the process of adult learning, and many adult learners fall into one of three categories: Navigators, Problem Solvers, and Engagers. Navigators are alert and ordered learners. Problem Solvers are critical thinkers who seek to discover constructive and efficient choices and solutions. Engagers function best when they are dynamically engaged in gaining and comprehending new knowledge. Adult learning is based on the proactive and learner-centered approach. This approach stimulates the student through the development of theory-to-application content that teaches critical thinking and problem solving in the context of the subject matter of the course and the method of course delivery (McCoy, 2006).

## Learning Styles and Online Learning

Instructors need to consider learning styles because technology is part of the educational environment (Buch and Bartley, 2002). The instructor needs to know the learning style of the students in order to effectively deliver the course content. The instructors also need to utilize a variety of teaching, learning, and assessment methods to enhance new knowledge development (Zapalska and Brozik, 2007). According to Kelly (2006), when it comes to teaching adults, the instructor needs to be flexible and be able to adapt the material to real-life examples that the adult learners can relate to. There are six factors that motivate adult learners: attitude, need, stimulation, affect, competence, and reinforcement (Kelly, 2006).

Technology is enhancing access to learning for students (Li and Edmonds, 2005). As a result of online learning, many adult learners are benefiting from being educated through technology (Taylor, 2006). Although there are many positives to technology, there has been negative feedback concerning the introduction of technology to education according to Buckley and Smith (2008). Acceptance of technology in various academic communities has been varied. While some colleges have embraced online learning as an innovative wave of the future, others have questioned its value and credibility (Buckley and Smith, 2008). There have been concerns regarding cost and complications of technology (Gibson, Harris, and Colaric, 2008).

Technology is advancing at such a rapid rate that it is a necessity for colleges to stay competitive in

their ability to provide educational opportunities to the most diverse spectrum of students. Technology is not cheap, and it is tapping into the limited resources of colleges and universities (Gibson, Harris, and Colaric, 2008). There is a need for better planning and collaboration to stay current with not just technology but the best ways to reach and teach adult students.

In addition to the business side of education, the academic side has had negative feedback toward technology in education. The virtual environment has issues that cause a negative experience for both the instructor and the student. Consistency, clarity, and knowledge are just a few areas that are critical for a virtual environment to work. However, in most cases these are the same areas that are lacking in the classroom environment (Dykman and Davis, 2008).

Though inquiry and inductive techniques have been promoted for many years, new technologies give learners options in implementing these approaches that were unavailable to teachers as recently as a decade ago. These techniques require learners to have access to large quantities of specific information. Today, the World Wide Web provides opportunities for learners to access information available at locations throughout the globe. With proper training, learners can engage in incredibly diverse activities. For example, teachers can involve learners in reading speeches from Martin Luther King, Jr.; view paintings housed in museums in France; and even download voice and music files from the 1950s. When instructors engage adult learners in technology-driven learning approaches in this new environment, they do not act as an assembler and presenter of information. Rather, they facilitate learning by requiring students to find creative and innovative solutions from new and different paradigms.

### Technology and the Adult Learner

According to Gold (2005), adult learners have many technical challenges compared to their traditional learner counterparts. Many adults have barriers such as lifestyle, work, and time constraints that keep them from learning how to use technology. Anxiety has proved to be one of the major obstacles for adult learners when embracing technology and online learning (Gold, 2005). The best way to approach technical anxiety is to understand the student's expectations and make the curriculum interactive (Gold, 2005). Making support available and providing structure that allows the student to grow are critical to relieving student anxiety (Fidishun, 2000).

### Types of Technology Being Used to Educate Adults

Technology has made a great impact on education in the 21<sup>st</sup> century. Adult learners use a combination of print, data, video, and voice technology to attain vast amounts of training and degrees. Technology is used in two instructional categories: synchronous and asynchronous (Diaz and Cartnal, 1999).

Synchronous instruction occurs when students participate at the same time. Using this type of instruction, the instructor can simulate the real-time environment of the traditional classroom setting. This form of instruction works well during chat sessions and conferencing via telephone or web. Many discussion periods are enhanced by using this method because students benefit from the value of immediate reactions and answers that participants would not receive from other technology, such as online threads (Diaz and Cartnal, 1999).

Asynchronous instruction occurs when students participate at their own rate. Using this type of instruction, the instructor can present the material and the student can take time to absorb new information. This form of instruction works well for correspondence and web-based courses. Many adults choose this style of instruction because they can fit learning into their busy schedules (Diaz and Carnal, 1999).

## Conclusion

The partnership between education and technology has made a great impact on the lives of many students. People once called hopeless in the traditional education environment now excel above because technology can be structured to the individual student on a level that traditional education cannot reach. There are many technology-based curricula – enough to enhance every learning style. Some respond to the student's every learning need; others cater to a broader audience. Whether the student needs stimulation, motivation, or clarification, technology can be designed to shape and mold the student in a way that can only be done by innovation.

Technology is only going to improve in its presence and function in the education field. As curriculum developers and online designers become more innovative in their approaches to tailoring to adult learning styles, these scenarios will only enhance the learning options for adult students in print, data, video, or voice.

When instructors use new technologies to develop learners' capacities as researchers, there are opportunities to accommodate their individual learning styles and preferences. For example, instructors can provide alternative suggestions to adult students who, respectively, prefer to learn (1) by reading materials, (2) by watching video clips on YouTube, or (3) by hearing speeches. Educational specialists who advocate using new technology for this purpose point out that learners find this kind of intellectual engagement motivating (Morrow, 2001).

## References

- Aslanian, C.B., and Brickell, H.M. (1980). *Americans in Transition: Life Changes as Reasons for Adult Learning*. New York, NY: College Entrance Examination Board.
- Baron, Renee. (1998). *What Type Am I?: The Myers-Brigg Type Indication Made Easy*. London: Penguin Publishing.
- Buch, Kim, and Bartley, Susan. (2002). Learning style and training delivery mode preference. *Journal of Workplace Learning*, 14(1/2), 5.
- Buckley, Wendy, and Smith, Alexandra. (2007). Application of Multimedia Technologies to Enhance Distance Learning. *Review*, 39(2), 57.
- Cercone, K. (2008). Characteristics of adult learners with implications for online learning design, *AACE Journal*, 16(2), 137-159.
- Chiou, Wen-Bin (2008). College Students' Role Models, Learning Style Preferences and Academic Achievement in Collaborative Teaching: Absolute Versus Relativistic Thinking. *Adolescence*, 43(169), 129.

Claxton, C.S., and Murrell, P.H. (1987). Learning Styles: Implications for Improving Educational Practices. ASHE-ERIC Higher Education Report No. 4, 1987.

Diaz, D. P., and Cartnal, R. B. (1999). Students' learning styles in two classes: Online Distance Learning and Equivalent On-campus. *College Teaching* 47(4), 130-135.

Dobrovolsky, Jackie (2006). How Adults Learn from Self-Paced, Technology-Based Corporate Training: New Focus for Learners, New Focus for Designers. *Distance Education*, 27(2), 155.

Dunn, R., and Dunn, K. (1978). *Teaching Students through their Individual Learning Style: A Practical Approach*. Reston, VA: Reston Publishing.

Dykman, Charlene A., and Davis, Charles K. (2008). Part One – The Shift Toward Online Education. *Journal of Information Systems Education*, 19(1), 11.

Dynan, Linda, Cate, Tom and Rhee, Kenneth. (2008). The Impact of Learning Structure on Students' Readiness for Self-Directed Learning. *Journal of Education for Business*, 96-100

Eaton, Nick (2009), UW to eliminate about 1,000 jobs by May 1. Seattle Post Intelligencer. Retrieved April 14, 2009 from [http://www.seattlepi.com/local/405144\\_uwayoffs15.html](http://www.seattlepi.com/local/405144_uwayoffs15.html)

Education Place website (1999). Retrieved in December 17, 2008, from [geocities.com/educationplace/basic.html](http://geocities.com/educationplace/basic.html)

Fidishun, Dolores. (2000). Teaching adult students to use computerized resources: Utilizing Lawler's keys to adult learning to make instruction more effective. *Information Technology and Libraries*, 19(3), 157.

Fidishun, Dolores. (2000). Andragogy and Technology: Integrating Adult Learning Theory As We Teach With Technology. Retrieved in December 17, 2008 from [frank.mtsu.edu/~itconf/proceed00/fidishun.htm](http://frank.mtsu.edu/~itconf/proceed00/fidishun.htm)

Gardner, H. (2001) Jerome S. Bruner in J. A. Palmer (ed.) *Fifty Modern Thinkers on Education. From Piaget to the present*. London: Routledge.

Gee, D. G. (1990). *The Impact of Students' Preferred Learning Styles Variables in a Distance Education Course. A Case Study*. Portales, NM: Eastern New Mexico University.

Gibson, C. C. (1998). The distance learners' academic self-concept. In C. Gibson (Ed.) *Distance learners in higher education: Institutional responses for quality outcomes*. pp. 65-76. Madison, WI: Atwood.

Gibson, Shanan G., Harris, Michael L., and Colaric, Susan M. (2008). Technology Acceptance in an Academic Context: Faculty Acceptance of Online Education. *Journal of Education for Business*, 83(6), 355.

Gold, Helene E. (2005). *Engaging the Adult Learner: Creating Effective Library Instruction*

portal: Libraries and the Academy – Volume 5, Number 4, October 2005, pp. 467-481

Gregorc, A. (1982). *Gregorc style delineator: development, technical and administration manual*. Columbia, Connecticut: Gregorc Associates, Inc.

Gulati, Shalni. (2008). *Compulsory participation in online discussions: is this constructivism or normalization of learning?* Innovations in Education and Teaching International, v45 n2 May 2008, p183-192

Hanna, D.E. (1998). Higher Education in an Era of Digital Competition; Emerging Organizational Models. *Journal of Asynchronous Learning Networks*, Vol 2, Issue 1. March 1998, p66-95

Hillburn, Greg (2009). Area Universities Project Loss of 255 Jobs. The News star. Retrieved April 22, 2009 from <http://www.universitybusiness.com/newssummary.aspx?news=yes&postid=18918>

Imel, Susan. (1998). Technology and Adult Learning: Current Perspectives. Retrieved December 17, 2008, from [ericdigests.org/1999-2/current.htm](http://ericdigests.org/1999-2/current.htm)

James, W. B. and Gardner, D. L. (1995). Learning styles: Implications for distance learning. (ERIC Document Reproduction Service No. EJ 514 356).

Keefe, J.W. (1989). *Learning Style Profile Handbook. Accommodating Perceptual, Study and Instructional Preferences*. Vol. II. Reston, VA: National Association of Secondary School Principals.

Kelly, Michelle H. (2006). Teach an Old Dog New Tricks: Training Techniques for the Adult Learner. *Professional Safety*, 51(8), 44.

Kemp, J. E., Morrison, G. R., and Ross, S. M. (1998). *Designing effective instruction* (2nd ed.). Upper Saddle River, NJ.

Kolb, D.A. (1985). *Experiential Learning Experience as the Source of Learning Development*. Englewood Cliffs, NJ: Prentice Hall.

Kostovich, Carol T., Poradzisz, Michele, Wood, Karen and O'Brien, Karen L. (2007). Learning Style Preference and Student Aptitude for Concept Maps. *Journal of Nursing Education*, 46(5), 225.

Knowles, Malcolm. (1984). *The Adult Learner: A Neglected Species* (3rd ed.). Houston, TX: Gulf Publishing.

Li, Qing , and Edmonds, K. A. (2005). Mathematics and At-Risk Adult Learners: Would Technology Help? *Journal of Research on Technology in Education*, 38(2), 143.

Mackeracher, D. (2003). *Making Sense of Adult Learning*. Toronto: University of Toronto Press.

Mansfield, Duncan. (February 27, 2009). *UT Looks to Raise Tuition, Cut 777 jobs*. The Associated Press.

McCoy, Mark R. (2006). Teaching style and the application of adult learning principles by police instructors. *Policing*, 29(1), 77.

Merriam, S.B., and Caffarella, R.S. (1991). *Learning in Adulthood*. San Francisco, CA: Jossey Bass.

Morrow, J. (2001). *Choosing excellence: 'Good enough' schools are not good enough*. Landham, MD: Scarecrow Press.

National Center for Education Statistics. (August 6, 1979). *News Release: Adult and Continuing Education in Colleges and Universities*. Washington, D.C.: Office of Education, U.S. Department of Health, Education, and Welfare.

O'Conner, Terry. (2008). Retrieved December 17, 2008, from [iod.unh.edu/EE/articles/learning-styles.html](http://iod.unh.edu/EE/articles/learning-styles.html)

Orr, Claudia, Allen, David, and Poindexter, Sandra (2001). The effect of individual differences on computer attitudes: An empirical study. *Journal of End User Computing*, 13(2), 26.

Pope, J. (February 24, 2009). Some colleges offering 3-year bachelor's degrees. USA Today *The Associated Press*. Retrieved August 8, 2009 from: [http://www.usatoday.com/news/education/2009-02-24-three-year-degrees\\_N.htm](http://www.usatoday.com/news/education/2009-02-24-three-year-degrees_N.htm)

Ruyle, J., and Geiselman, L. A. (1974). Non-traditional Opportunities and Programs. In K. P. Cross, J. R. Valley, and Associates, *Planning Non-traditional Programs: An Analysis of the Issues for Postsecondary Education*. San Francisco: Jossey-Bass.

Rybarczyk, Brian J. (2007). Tools of Engagement: Using Case Studies in Synchronous Distance-Learning Environments. *Journal of College Science Teaching*, 37(1), 31.

Sacramento County Office of Education. (2005). What is distance Learning, Retrieved December 17, 2008, from [cdlponline.org/index.cfm?fuseaction=whatisandpg=2](http://cdlponline.org/index.cfm?fuseaction=whatisandpg=2)

Sadowski, M. A., Birchman, J.A. & Harris, L.V., (2006) An Assessment of Graphics Faculty and Student Learning Styles. *Engineering Design Graphics Journal*. 70, (2).

Smith, M. K. (2002) 'Malcolm Knowles, informal adult education, self-direction and andragogy', *the encyclopedia of informal education*, [www.infed.org/thinkers/et-knowl.htm](http://www.infed.org/thinkers/et-knowl.htm).

Sosdian, C. P. (1978). *External Degrees: Program and Student Characteristics*. Washington, D.C.: National Institute of Education.

Sperling, John. (1989). *Against All Odds*. Phoenix, AZ: Apollo Press.

Steinbach, R. (2000) *Successful Lifelong Learning*. Menlopark, CA: Crisp Learning.

Taylor, Maurice C. (2006). Informal adult learning and everyday literacy practices. *Journal of Adolescent and Adult Literacy*. 49, 6; Research Library pg. 500

Terris, Ben. (April 10, 2009). Wellesley College cuts 80 non-faculty jobs. *The Boston Globe*.

U.S. Bureau of the Census. (1979). *School Enrollment-Social and Economic Characteristics of Students: October 1978*. Current Population Reports, Series P-20, No. 335. Superintendent of

Documents, U.S. Government Printing Office, Washington, D.C.

Wynn, S. (2006). *Using Standards to Design Differentiated Learning Environments*. Boston, MA: Person Custom Publishing.

Zapalska, Alina, and Brozik, Dallas. (2007). Learning styles and online education. *Campus – Wide Information Systems*, 24(1), 6.

Zhang, Li-fang (2008). Teachers' Styles of Thinking: An Exploratory Study. *The Journal of Psychology*, 142(1), 37.

VN:R\_U [1.9.11\_1134]