The Linkage of Technology and Lifelong Learning

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Abstract

Adults have different learning styles that are based on personal learning habits for years. They follow their learning styles to choose programs to update their knowledge and skills as lifelong learners, but learning failure would also frustrate their motivation of continuing learning. Due to high dropout rate of adult learners in formal or non-formal education institutions, adult learners need specific methods when conducting lifelong learning. Technology as multimedia can do the help and linkage between lifelong learners and the fast-changing world. Currently using email via computer, having conference via telecommunication, and surfing a variety of sources in library or at home become very convenient accesses for lifelong learners in the information society. Unfortunately, adult learners are usually filled with anxiety to use technology because most of them view technology as a complicated tool. They hesitate to learn different kinds of technologies around them. Hence, teaching adults to learn technology to search information by themselves is a hot topic mentioned by adult educators. To be competent in the workplace, employees need to learn functional literacy and computer literacy to execute their daily work better. Technology is the most useful tool that lifelong learners can hook on the world faster. Therefore, encouraging lifelong learners to learn to use technology is a new trend around the world.
Nevertheless, people have done plenty of effort to try the linkage in distance education. Distance education successfully links adult learners and technology together and the linkage can be applied to lifelong learners and multimedia. Education institutions such as universities have the responsibility to offer courses to teach adults to be familiar with technology or provide programs that match adults learning styles.

Keywords: technology, lifelong learning, multimedia, teaching style, learning style, distance education
The Linkage of Technology and Lifelong Learning

Technology and globalization are two vectors that operate simultaneously to drive the world (Morrison, 1988). How can a country apply technology to be globalized? A possibility today is to encourage lifelong learners to use technology to learn what they want and need through adult education.

Lifelong learning has caught people's attention from industrialized countries to the Third World and most developing countries with different emphases. When most developed countries pursue improvement through lifelong learning, countries that are still struggling with economical problems are tied up to providing more literacy learning for enhancing basic education. No matter different intentions that countries have, lifelong learning as a strong cultural-political base, as the priorities, of necessity, to place on economic concerns (Overly, McQuigg, Silvernail & Coppedge, 1980). While learning has become a lifelong necessity, "lifelong learning" is used as a rationale for updating changes. Hence, it becomes to symbolize the popular trend in the current lifelong learning world.

Since lifelong education has emerged in the world to lead adults to enhance their capacities for decades, it presents to the world by different faces. Broken into three specific constituent elements, lifelong learning includes initial education, adult education, and the diffuse learning environment (Belanger, 1995). People understand that learning does not only take place through organized educational, formal or non-formal processes, but it also happens throughout life, as the form of informal or incidental learning. Many people are involved in adult education institutions, industries, non-governmental organizations, private sectors, and in the media. In short, more and more people learn throughout the life-course by a relatively autonomous influence on the participation in educational activities. As Belanger (1995) mentioned, three phenomena build the
emphasis of lifelong learning: (a) Education is occupying a larger and larger place in peoples’ life-span. (b) A reduction of work-time in occupational life and a decrease in the global volume of paid working-time in occupational life exist, and (c) The post-paid-work cycle has increased. For earning more credits through lifelong learning, the number that adults, particular working people, turn to an adult education institution is increasing.

Adult education, therefore, tends to become a predominant role particularly in industrialized areas. The demands derive from the changing organization of work, from the introduction of new technologies, and from the process of industrial restructuring. However, adults usually carry "baggage barriers" into learning process. The baggage contains "history, culture, values, attitudes, dreams, sex, self concept, physical attributes, abilities, skills, knowledge's, education, beliefs, and life experiences" (Even, 1987, p. 22). Those barriers cause learning in adults differently from that in younger age as well as the high dropout rate in adult education.

Although adult information-centers and educational brokering services have provide the most important link in the joint concerns of equal opportunity and the effective utilization of learning resources. Now the issue is how can people make the best linkage between technology and lifelong learning to make their learning the most useful and most efficient? From addressing the relationship between teaching and learning styles and technology, the role of distance education in lifelong learning explicit how it works and which institutions can do some help, this paper shows the importance linkage between technology and lifelong learners.

Technology and Teaching-Learning Styles

Communications within and between institutions will be considerably eased by technology, but the introduction of new technology is never neutral. Technology does change the nature of the learning experience and give hands to connect
the need of adults and lifelong learning by matching teaching and learning styles. Plenty of studies that focus on learning and teaching styles intend to help adult learners who study via correspondence education in a distance. One of findings is "only those who can tolerate non-social learning conditions survive in a program where dialogue is so low" (Coggins, 1988, p. 27). Distance education is exactly the very tool that applies lots of technologies to provide their educational programs. Technologies then turn to be conveyors that connect instructors and learners in adult education.

**Useful Technologies**

Technology is defined as "The scientific method and material used to achieve a commercial or industrial objective" (American Heritage College Dictionary, 1993, p. 1393). By the increasing diverse technologies, the concept includes broader methods and materials that are applied to improve human beings' performance in different disciplines. Usually technologies include artificial intelligence, compact disc, electronic publishing, computers, satellites, audio-visual media, videodisks, cable TV, super 8 film, broadcast television and radio, telephone and fax, view-data, electronic blackboard, or home computer terminals linked to mainframes. Therefore, it is viewed as multimedia to implement communication easier and more convenient. When multimedia are applied to improve education efficiency, educators should take it as their responsibility that they need to teach learners to operate skillfully. Currently the dominant linkages between technologies and learning are home-based learning, center-based or work-based learning, communications within and between systems. Most adult learners have technology at home after more and more people can afford some facilities that are easily to use and are not too expensive. Eventually, education institutions encourage learners to study by the help of technology in studying activities.

Technologies have blended of independent, self-determined learning, and high interactively unreachable a few years ago (Dunning, 1993). Telecommunica-
tions do have the effects on forms of distance education as coordination, need for educational equity, bring efficiency and economy to education and exploit potential opportunity to share educational resources. Human beings expect media in improving communication, such as teaching and learning by using hypermedia, a fluid mixture of voice and computer technologies will allow learners to progress through material in the sequence of their choice with a touch of their finger to a computer screen. Then, the biggest barrier hinders in front of adult learners is the application of technology in their learning process. However, understanding individuals' teaching and learning styles help people to get closer with the linkage between technology and learning.

**Teaching-Learning Styles**

Style refers to a person's pervasive qualities that persist even though situation conditions may change. Teaching style is a label associated with various identifiable sets of classroom behaviors by the teacher, it is a major influence on student's achievement (Fischer & Fischer, 1979). Whereas, "Learning style refers to the characteristic ways each individual collects, organizes, and transforms information into useful knowledge" (Cross, 1976; Kolb, 1984). An instructor as well as the learners are two most important variables who influence greatly at learning climate and result. Knowles (1970) recommended that adult educators should use the collaborative model when teaching adults.

In addition, learning is very personal and private because each person gives response and makes sense of new information, communication input, and ideas in a different way. Some researchers believe that motivated students learn from any medium or system (Coldeway, 1986). Wilkes and Burnham (1991) even found that highly motivated learners may be willing to endure almost any educational environment or process to achieve a passing grade, more than grades need to be examined to evaluate educational experiences of individual's study. Adult educators also believe that self-direction is popular in adult learning process that they
would push themselves to learn autonomously.

Is there any particular preferred learning style indicators that are predictors of a greater potential to succeed in an adult learning program? Coggins' study (1988) proved that there was no relationship between successful completion of a baccalaureate degree pursued through distance education and the preferred learning styles. However, in order to foster effective learning, teachers and students should be aware of their teaching or learning styles to make the best match with what technologies they are taking. Garrison and Shale (1990) asserted that educators not only should emphasize the macro-level, teacher, student, and content, but they also need to keep an eye on the micro-level such as independence, proficiency, and support which together constitute true control of the educational transaction.

Therefore, getting to understand teaching or learning style in study bridges the connection between technology and learning is widely accepted, particularly in the distance education institutions that provide programs for lifelong learners.

**Distance Education and Lifelong Learning**

Distance education is a flexible option for the provision of learning services. It is indeed an international phenomenon (Moore, 1989). Keegan defined distance education as scientific, stipulative, descriptive, programmatic, educational slogans, and metaphorical descriptions, but concluded that only three brief illustrations can be considered, i.e., distance education is liberal, open, and the aim of distance education is access (Keegan, 1993). Keegan's definition earned acceptance widely by the description of "separation of teacher and learner during the main mode of instructional delivery, the use of technical media, and the use of two-way communication as well as the participation in an industrialized form of education" (Clark & Verduin Jr., 1989, p. 24). Because learning in a distance via multimedia provides students a flexible access to study, it accommodates varied time and space realities of part-time adult learners. It is exactly a
"process-based" learning system, not bound by time, age, or location, and provides lifelong learning opportunities in the real sense of the world.

Technology and Distance Education

Technology then is closely combined with distance education. Although some people always doubt the quality of distance learning, especially the application of technology by learners, some people evaluate distance education positively. Kinna-man (1995) said, "Distance education is about a collaboration between teachers and technology to help students learn" (p. 58). The goal of distance education is to help learners who are and want to be independent and to suppose they should be helped to be more independent (Garrison & Shale, 1990). Technology, thus, helps independent study to stress learning rather than teaching, that is, the key to learning is what students do, not what teachers do. By and large, distance education is as a process of "two-way communication between teacher and student which necessitates the use of technology to mediate this interaction" (Harry & Keegan, 1993, p. 201).

Distance education is typically student centered because students choose to remain in employment, at home, with their families and expect to get institutional learning as well. The learner-centered system changes teaching activity focused on facilitating learning (Beaudoin, 1990). Consequently, technology has played a significant role to make the conventional campuses change, particularly in distance education, the teaching and learning roles are interchangeable. Currently, learners communicate with instructors to discuss questions, submitting assignments, reports, or papers, or even taking tests via email easily without restriction of time. Distance education institutions take technology as a best means to proceeding their programs.

From correspondence education to teleconferencing, audio teleconferencing, distance education technologies have moved to the fourth generation system: integrating computer-assisted learning and computer conferencing (Garrison &
Shale, 1990; Lauzon & Moore, 1989). Distance education promotes social quality, gives new employment possibilities, and is a means of individual self-fulfillment. It can also be a force for national economic and technical development as well as train the underdeveloped sectors of the labor force and provide continuing professional education to the most highly educated.

Distance education is no longer a new field and has becoming widely accepted, but to get the entering key needed specialized training. People need to look more closely at why training may be needed, who needs training, and what kind of training it should be (Jenkins, 1993). Jenkins confirms that all distance educators need training as well as today's employees because they are almost engaged in a continuous process of knowledge and skills' acquisition throughout their working lives.

How Does It Work?

Then the problem is how distance education guarantees the study results from it are equivalent to that from traditional education. What are the factors that account for a student's success or failure in distance learning programs? Tompson (1984) and Moore (1989) suggested a relationship between learning style-related variables and completion/satisfaction in distance learning programs. Clark and Verduin Jr. (1989) mentioned that research had found that the performance of distance and conventional students in the same courses was academically equivalent. For example, in 1987 Clark's survey and international studies showed the distance students achieving equivalent to their conventional counterparts. Ehrmann (1988) also believes that both accessibility and quality learning can be achieved with new communications technology and distance educators have largely relied. Furthermore, it is important to find out what methods of distance education are better suited to most students. For instructors and learners who have special styles in teaching and learning, they should take technology to help them to reach the best use of the most appropriate media.
Although distance education dropout rates are twice those of conventional education, the distance students remaining after attrition may be more motivated than conventional students. Educators have found adult learners motivate themselves in learning more actively by autonomy. Therefore, distance study offers solutions to some of the perennial problems, such as the quality of distance learners' learning results, is facing lifelong educators. When properly done, distance education can provide high-quality learning experiences at lower cost. For students, distance study means access and flexibility.

The Relationship of Technology and Lifelong Learners

Teaching Lifelong Learners to Use Technology

Indeed, adults need encouragement to learn using technologies, such as to learn computer literacy in order to operate it well in basic functions as well as in surfing the internet. Devlin (1993) suggested that the prime prerequisite task of teaching adult technologies is ask them to learn "how to learn". Jenkins (1993) took organized training sessions, self-study, or study through distance learning as formal training strategies, whilst peer attachment, introductory work experience, fellowships and study tours as informal ones. After learners know how to use technology skillfully, Sparkes (1993) reminded that face-to-face tutorials could be replaced by distance-teaching versions, one-to-one telephone tutorials, telephone conferencing, or computer-conferencing. For study materials, Gunawardena (1990) indicated some helpful forms could support students when they considered using video-based instruction. Those forms include the study guide, interaction by telephone, individualized and computerized feedback from faculty, and access to library resources.

People enrolled in distance educational programs are very task oriented,
Moore (1989) asserted that "it is not possible to meet all these expectations in teaching through any one medium" (p. 9). Since adult students are capable of directing their own learning, distance educators can help those adult learners in meeting their needs, feedback, support, and promptness. Instructors, therefore, should combine the teleconference and printed text, some proper media in teaching.

The Responsibility of Universities and the Workplace

Today the higher education is no longer assured a full-time commitment of students but towards a high level of part-time-learner's trend. That means, students are changing from a full-time commitment, for four years, to a part time commitment for 40 years. In 1970s, external degrees came suddenly and powerfully to the attention of the U. S. academic community (Coggins, 1988). The external degree has had its roots for decades. That is, correspondence study ruled the "alternative learning" world from 1850s, the advent of cooperative extension and the extension degree programs of the early 1900s, and the development of the British Open University.

Although distance education has become a convenient, economical way for adults to learn, the reception of it among the public and the faculty in higher education still needs to improve. According to the national survey result of Clark in 1993, faculty attitudes toward distance education are complicated. Their support for greater access was mixed with concern about quality, especially the quality of interaction; about ensuring effectiveness through use of distance education in appropriate circumstances with adequate administrative and technical support; as well as about professional rewards for the distance teacher. The study showed clearly "both distance education supporters and skeptics agree on the need for high standards and for adequate resources and personnel, whatever the method of instruction" (Clark, 1993, p. 32). To break the mistake of distance education, enhancing the connection between technology and learning to
improve the learning results is a good method deserve trying.

Because an increasing combination between technology and learning, most universities carry a responsibility to improve the quality of distance education, particularly when highly demands adult education to take the task for upgrading knowledge and skill, such as adult literacy (Knox, 1993). Adult learners should not only know how to searching information from libraries, they also need to have basic skills to use technologies to help them work it more effectively. Consequently, universities should provide more courses such as "Introduction to Computer" or "Teaching and Learning via Internet" to polish adults' computer knowledge and skills. The learning would keep them up with the continuous changing world to be more competitive.

Furthermore, formal institutions of higher education no longer control the market for the provision of educational services (Morrison, 1988). For example, in 1985, higher education only provided one thirds of adult education in the U. S., but business spent more than all fifty states on training. Obviously, the transformations of new knowledge and skills and the increased occupational mobility have given an impetus to a large renewal of qualification among the active population. For employers who want more capable workers to improve performance to compete with other companies, even other countries, functional literacy learning is a necessity. That learning improve workers' performance better in the workplace, and employees, then, get the skill from learning.

Employees are increasingly aware of engaging themselves in helpful on-the-job learning programs to improve performance. However, in-service programs must offer convincing, no-nonsense and on-going training that deals with how to teach at a distance, not merely how to manipulate new instructional technology (Beaudoin, 1990). Working people tend to continue their learning with jobs, universities and adult education institutions should match their needs to offer them more courses. In order to lead a country to be global competitive, taking good use of technology to learn in the lifelong process is unavoidable.
Conclusion

If lifelong learners are ultimately benefit from increased use of technologies that widely applied in distance education, "the rationale for adding new technologies must be a pedagogic one rather than a technological one" (Schieman, 1990, p. 75). Teaching and learning styles that can facilitate learning in a distance teaching system should be integrated with the medium of instructional delivery. People should consider some important elements such as cost, learning effectiveness, major variations from country to country in the speed at which various technologies are likely to be available. Most importantly, the educational and operational rationales for using technologies, such as choice of technologies is not just a technical decision, but requires value judgments as well.

Distance educators need training in using technologies well to work better, either in teaching or in administrative affairs. Particularly specialists in universities should take improving the quality of distance learning as their responsibility to improve the results. Although there is not a super medium and a best distance education program to deliver information, to match teaching or learning styles with various forms is an option. Then, different technologies that suit for different learning styles, and that would give the greatest range of alternative communications modes. Only through the recognition of corrections between the lifelong education and initial education leads to the inference that no educational policy can be solely educational and ignore the media, the adult education institutions, the other cultural industries, as well as the impact of the different urban or rural physical environments.
References


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科技與終生學習的結合

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摘要

成人基於個人多年的學習習慣而各有不同的學習形態。他們以終生學習者的立場，依照個人的學習形態來選擇提升個人的知識與技能。所以學習失敗會使成人繼續學習的動機遭到挫折。由於成人學習者無論在正式或非正式教育機構中都有很高的報學率，成人學習者需要有特殊的方法來從事終生學習。科技，如多媒體的使用能幫助終生學習者與這個快速的變遷的社會結合起來。目前使用電子郵件，舉行電傳視訊會議，或是在圖書館或在家上網流覽蒐尋所需的資訊，已經成為現代社會中相當便捷的路徑。

不幸的是，成人學習者在使用科技時經常充滿焦慮，因為他們大部分將科技看成一種複雜的工具，而猶豫去使用。因此，教導成人學習者使用科技以能自行蒐集資料一直是成人教育工作者的熱門話題。要在工作場合中表現稱職，員工需要學習功能性字彙及電腦語言來執行其日常工作使表現更佳，科技於是成為終生學習者與世界接軌的最佳利器。因此鼓勵終生學習者學習科技的使用是世界的新趨勢。

雖然如此，人們已經在隔空教育體系中盡力嘗試此結合。隔空教育成功地聯結成人學習者與科技，而且這個聯結是可以應用到多元媒體中，如大學等教育機構有責任提供有關課程教導成人熟悉科技媒體的使用，或是開設吻合成人學習形態的學程。

關鍵詞：科技，終生學習，多媒體，教學形態，學習形態，隔空教育