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Cognitive Benefits of Participation in Lifelong Learning Institutes

Patricia Simone and Melinda Sculli

Abstract

This essay examines the role of cognitive stimulation in maintaining high cognitive functioning in later life. Cognition is dependent upon brain function and brain function can be improved through physical exercise and cognitive stimulation. Lifelong learning institutes offer older adults a myriad of opportunities to enhance their cognitive function. These institutes are not unique to the United States and need not offer courses in any particular format in order to facilitate cognitive benefits.

Introduction

The fountain of youth eluded Ponce De Leon. Even so, Americans born today can expect to live nearly 30 years longer than Americans born a century ago (National Center for Health Statistics, 2005). The current challenge is not adding years to our lives, but keeping the life in our years. In other words, we are not satisfied to merely live long. Our goal is to live long well. What can we do to age successfully?

Rowe and Kahn (1988), in their groundbreaking investigation into positive aging, suggest three keys to successful aging: (1) maintain high cognitive and physical functioning, (2) stay engaged with life, and (3) avoid disease. This article will emphasize ways in which involvement in university-sponsored lifelong learning institutes promote successful aging through improved cognitive functioning.

Cognitive functioning includes our ability to think, reason, and judge. Many scientists study cognition (e.g., cognitive psychology, cognitive neuroscience, neuropsychology), often examining topics such as attention, memory, and intelligence. While not everyone is familiar with the scientific definition of cognition, most people fear the loss or decline of cognitive ability. Specifically, Alzheimer's disease, which is primarily a disorder of cognition, is a leading concern of older adults. Therefore, there is a great interest in finding ways to maintain or improve cognition in later life.

Cognitive functioning is dependent on several factors. First, cognition depends on the health and fitness of the brain. Brain fitness can be improved by cognitive and physical stimulation. Mental health and social factors also have an impact on cognition (e.g., depression). While many people assume that we have very little control over our cogni-

tive functioning, lifestyle choices can significantly affect cognition in later life. Some relatively simple changes to our lifestyle can dramatically improve our opportunity for aging successfully.

Cognition and the Brain

Our ability to think depends on brain function. Unfortunately, the brain suffers damaging consequences of aging, including loss of brain weight through neuronal loss and the accumulation of plaques and tangles. The hippocampus, a part of the brain essential for learning and memory (e.g., Numan, 2000), is especially targeted in the aging process. Changes in the hippocampus are correlated with the decline in the ability to learn new tasks (e.g., Gage et al., 1984).

Brain health and fitness are major concerns in aging. Can anything be done to reduce the deleterious consequences of aging on the hippocampus? Fortunately, the answer is “yes.” Both physical exercise and cognitive stimulation appear to be able to reduce, if not reverse, the negative effects of aging on the brain.

Aerobic Exercise

In a recent study, van Praag et al. (2005) examined learning ability in mice. Aged mice allowed to exercise on a running wheel were faster to learn a memory task (Morris water maze) and they maintained the memory longer than age-matched control mice. These researchers found that the aged-mice who exercised showed similar development of new neurons in the hippocampus as young mice. They concluded that voluntary exercise can reduce deficits in learning and loss of neurons that are commonly associated with aging (van Praag et al., 2005).

Fortunately for humans, the beneficial effects of exercise on cognition is not limited to mice. For example, one study found that older adults (65+) who exercised throughout life lost less brain tissue than non-physically fit aged adults (Colcombe et al., 2003). Another study found that aerobic fitness in later life improved performance on cognitive tests (e.g., Kramer et al., 1999). Sedentary people lose brain tissue faster than active people, with likely cognitive consequences. While exercise is one way to improve cognitive function, fortunately for many, it is not the only way.

“Use it or Lose it”

Learning can improve cognition and cause physical changes in the brain. Early work of Marian Diamond and colleagues found that mice living in an “enriched” environment consisting of more cage space, a running wheel, and a tunnel developed heavier brains, increased thickness in certain brain structures, more connections between nerves including increased branching of neuronal projections, and differences in the levels of some neurotransmitters. Significantly, these mice were more successful than the control group on learning tasks like maze navigation. These results implied that the brain function improvement was a result of the environmental changes (Rosenzweig et al., 1972).

Alvarez-Borda and Nottebohm (2002) studied the ability of the canary brain to adapt and grow new brain cells in order to learn new songs each year. Birds that utilized their new brain cells by singing retained those cells longer. Birds whose songs were interrupted by an outside event produced less of a chemical that advanced cell growth and

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survival. In this study, birds that engaged in learning new songs and were able to interact with the world increased benefits to their own brain functioning.

Research with animals has shown that how they spend their days (enriched environments, in song) has an impact on their cognitive ability. Again, this effect of learning on cognition and the brain extends to humans. The Seattle Longitudinal Study is considered to be one of the most extensive psychological research studies of how people develop and change through adulthood. This study followed 500 Group Health members from 1956 to 1998 in seven year intervals. Participants were evaluated on a number of levels to account for age related change, especially cognitive decline. Results showed that variables important to reduce cognitive decline include involvement in a complex and intellectually stimulating environment and maintenance of high levels of perceptual processing speed, among others. Conversely, limited cognitive engagement can result in increased cognitive decline (Schaie, 1997). They suggest that the cognitive decline observed in many community-dwelling older adults may be reversed by increasing cognitive stimulation.

Another study involved a longitudinal examination of nuns and priests followed since 1993. Members of this population that engaged their minds for a “significant” amount of time in any of seven information processing activities (including reading the newspaper, going to museums, and playing puzzle games) had a 47% less chance of developing Alzheimer’s Disease than did people who did not challenge their minds in this way (Wilson et al., 2002). Some speculation considers that mentally stimulating activities protect the brain in some way and perhaps the more adaptable and nimble the mind, the more it can compensate for the declines in other areas (Wilson et al., 2002). Cognitive stimulation is essential. Additionally, in the Nun Study, Snowden and colleagues provide evidence that mental decline is not inevitable and, in fact, indicate that lifelong learning may even prevent or delay the symptoms of dementia and Alzheimer’s Disease (e.g., Snowden, 2001).

Other studies demonstrate that how we spend our days also has an impact on our cognitive abilities. In particular, compared to the general population, college professors perform significantly better on cognitive tasks (Shimamura et al., 1995). Can professorial responsibilities improve cognitive function? Professors are in an environment in which life long learning is encouraged. They learn in the classes they teach and the research in which they engage. They are surrounded by intellectually stimulating events including scholarly talks, museum exhibits, theatrical and musical performances. Their jobs provide continuous mental stimulation, and this stimulation has a positive impact on their cognition (and likely on their hippocampi too). University campuses offer excellent opportunities to provide the challenges, the enriched environment, which promotes improved cognition and successful aging. The benefits are not restricted to college professors.

Many universities now invite older community members to benefit from the rich learning environment available at college campuses. The many benefits of lifelong learning can be delivered to the older adult population through a variety of formats. The course format, which can be offered both with and without credit, is similar in content and structure to traditional university classes, and includes lecture, discussions, and workshops, which may be conducted by university faculty, staff, or led by peers. Regardless of format, the key is cognitive stimulation and engagement. Obviously, the more engaged the learner, the greater the benefits.

University Lifelong Learning: A Brief History

Nations around the world have identified lifelong learning as an important matter of public policy. Both public and private organizations in a variety of formats attempt to address the educational needs and wants of older adults.

U3A, L'Universite du Troisieme Age or University of the Third Age, was founded in Toulouse, France in 1972 where universities began to provide educational opportunities for older adults. The experiment met with almost immediate success and soon spread to other European countries. Every member of the educational group is encouraged to contribute voluntarily to the running of their U3A organization in some way. U3A currently has millions of members. The French model of U3A consists of courses, lectures, and workshops taught by regular or adjunct university faculty (Yenerall, 2003). The success of the U3A is well-documented. For example, one study concluded that members of the U3A had better than average general, physical and mental health, and that membership contributes to the positive perception of well-being (Mitchell et al., 1997).

Lifelong learning has been widely and popularly accepted in Great Britain as well. The U3A made their way to Great Britain by 1981, but it was adapted and instead of being dependent on universities, as was the 'French' model, it became a movement based on self-help and mutual aid, a kind of "intellectual democracy" (Yenerall, 2003). This became known as the "Cambridge" or "British" model. The program still shares the common concept of encouraging older adults to remain active in their retirement and continue lifelong learning. However, in the Cambridge version a participant can be a course leader one day, then a student the next. Such peer led discussion groups have an expectation of reciprocity (Brady et al., 2003). For example, peers both plan and facilitate the courses, and learn from the teaching experience also. With the breadth and depth of the knowledge of the group, teachers and students are constantly changing roles (Brady et al., 2003).

Finland's educators also joined the U3A movement in the 1980's. Finland's lifelong learning programs do not have an age requirement and the number one reason for joining is to learn more, as compared to the more social seekers of other countries (e.g., United States). Finland's lifelong learning format is more a hybrid model of both France and Great Britain's format of facilitation (Yenerall, 2003). U3A institutions are affiliated with universities, as in France, but rely on peer groups to guide the content and course structure, much like in Britain. One interesting format that the people in Finland have added is Research Seminars. The two main programs of these seminars are actual research carried out by U3A members themselves or research on U3A students. Recently, a movement has begun to petition to offer college credit to count towards a degree for courses taken (Yenerall, 2003).

An initiative in Spain was undertaken in 1993 to open universities to seniors without creating separate centers, which they had done previously (Orte Socias et al., 2004). These officially recognized programs and courses are offered by various private and public universities in Spain and dubbed "University of Programmes for Seniors." The average duration of program length is three or more years and primarily is concentrated in the social, medical and technological sciences. The focus has been on the integration of the older population into the university through specific educational offerings. Other objectives include developing positive attitudes to aging through activities and participation, providing a framework for intergenerational relations, and improving the quality of life for older adults. In fact, the university programs promote intergenerational

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activities to encourage contacts between senior students and the traditional students (Orte Socias et al., 2004).

Approximately 25,000 students have enrolled in these programs since their inception, and demand is very high. In the 2001-2002 academic year, the approximate number of students enrolled was 14,000. Since the programs do not have the same entrance prerequisites, the range of cultural and social dynamics vary. Females make up the majority of students, with a highest median age of 55-60 years old. Some 50 private and public Spanish universities now offer education specifically for seniors and it is expected that programs of this type will become more and more generalized into the 21st century (Orte Socias et al., 2004).

Lifelong learning in Japan is affected by cultural and social factors. Universities and colleges have rigid admission standards and only a small fraction of their students are above even traditional college age. Older learners can be served by the University of the Air, a TV and Radio based school in the Tokyo area, but these programs do not capitalize on the social and community benefits of lifelong learning (Iwanaga, 1992). The government does sponsor programs through the Ministry of Education, Science, Sports, and Culture, and these programs are available in most major cities to people who seek them out. However, the culture does not expressly encourage older members of society to seek these opportunities, and the government is attempting to change this societal view through promotional and educational programs (Wilson, 2001).

Lifelong Learning Institutes have many different names across the United States and Canada. There are over 400 unique organizations established at institutions of higher learning, both large and small, private and public organizations that offer lifelong learning to older adults. The first lifelong learning institute was named the Institute for Retired Professional (IRP) and it was established in 1962. Many colleges and universities replicated or adapted the IRP model ("A Brief Overview," 2005). During the 1980s, the discussion about lifelong learning increased dramatically. Several national conferences introduced the American form of lifelong learning to other nations and spurred the development of many lifelong learning institutes ("A Brief Overview," 2005).

No single "model" for Lifelong Learning Institutes (LLI) exists in the United States. Each LLI is sponsored by individual universities and are based on the goals and mission of the host university and the individual needs of each community. LLI's have been described as school without grades or tests, where the only prerequisites are an active mind and a desire to learn in a friendly and supportive atmosphere. These communities of learners design their own college-level curriculum according to their needs and interests, and their common bonds are intellectual curiosity and the experience of their generation. Lifelong learning institutes offer opportunities for local adults to be involved in ongoing academic programs geared to their interests. A commitment to learning is consistent among the many thousands of energetic and enthusiastic LLI members ("A Brief Overview," 2005).

An interesting new trend in lifelong learning and living in the United States is the "back-to-campus" movement. There are over 50 retirement living communities linked to colleges such as Stanford University, Notre Dame, the University of Michigan, Penn State University, Ithaca and Oberlin Colleges and the University of Florida. At Lasell College in Massachusetts, for example, there is a waiting list to move into the residence and the program requires its 200 residents to complete 450 hours of learning and fitness activities a year ("Campus Dream," 2005). "There is a mentality about the future

here rather than the past,” says Paula Panchuck, the dean of Lasell Village. “Instead of, ‘My life is over,’ it’s, ‘What classes are coming up in the spring?’” As the baby boomer generation ages, they will continue to actively seek out creative and innovative lifelong learning opportunities to integrate with their life (“Campus Dream”, 2005). This is an interesting way to encourage the older adults of our society to maximize the many benefits of lifelong learning.

Lifelong Learning Institutes: Cognitive Benefits

Lifelong learning has a positive and lasting impact on cognition. As can be seen from the international approaches to lifelong learning, the format or structure of the learning process can be flexible and learning can occur in a variety of formats, not just in a college classroom.

While everyday activities stimulate the brain and lead to cognitive benefits (e.g., Wilson et al., 2002), active learning is a complex process and can be considered an ideal means of cognitive stimulation. This learning does not have to be at the level of an advanced physics class at a university. It can simply be learning something new and stimulating, such as gardening or being involved in a group discussion on a current topic. However, in addition to direct cognitive stimulation through courses, there are other benefits to being a member of a lifelong learning institute.

A focus group study conducted by Lamb and Brady (2005) found members of an Osher lifelong learning institute to be highly energized by the “joy of learning.” This study also reported a dramatic increase in the self-esteem of the participants, as participants rejected the traditional stereotypes about aging and exhibited tremendous pride in their own accomplishments. Other anecdotal evidence is apparent in Cusack’s (1994) study on empowering seniors as leaders in a lifelong learning program in Vancouver, British Columbia. A participant responded that, “Education and learning keep me from getting depressed.” Another stated, “Just because your body begins to fail, doesn’t mean you lose interest in life and stop learning. In fact, study and mental growth can make the onset of illness more bearable.” Participants indicated a perceived increase in their ability to express their ideas clearly, the feeling that they have been heard, and an increase in self-esteem (Cusack, 1994). Lifelong learning provides older adults with the skills and confidence they need to participate effectively in decision-making processes, increasing their self-efficacy.

This form of self-esteem leads to improved performance in solving not only cognitive problems, but daily life challenges. Learning a new language, developing an understanding of different religions, and mastering new technologies provide examples of challenging problems that are useful in enhancing the belief in one’s ability to handle new tasks—the “Can-do Factor” (Mehrotra, 2003). For example, women who have traditionally filled the primary caretaker role in the home, find that lifelong learning provides them with opportunity to experience intellectual confidence that contributes to their self-esteem (Lamb & Brady, 2005). Both men and women reported feeling smarter and more intellectually competent.

This confidence contributes to a more positive attitude. Many lifelong learning educators have witnessed the transformation of learners, as people become visibly stronger, more vital and alive (Cusack et al., 2003). More evidence points to learning as a case for health promotion. Results of a survey in the UK of participants aged 40-60, reported the direct benefits of learning as reduced stress, reduced depression, feeling

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more positive, achieving goals, and more energy. (Cusack et al., 2003)

Social interactions are important for successful aging, yet many older adults find themselves alone. Isolation can contribute to feelings of depression. Relationships involve supportive behavior and the experiences of being supported have positive effects on physical and mental health (Mehrotra, 2003.) Support can help one obtain better or more prompt medical care, promote healthy group norms, and increase one's resistance to disease.

Social connection is identified in the U.S. as an important reason to participate in lifelong learning institutes. Learners have expressed passion for the myriad ways that lifelong learning has enriched their lives socially. They describe the experience as a safe and nurturing community where they could take intellectual and emotional risks (Lamb & Brady, 2005). Close interactions and relationships with other people are essential to our well being. These relationships involve supportive behavior, and the experiences of being supported have positive effects on health (Mehrotra, 2003.) The social network developed during the learning experience acts as a protective factor from many of the damaging effects of stressful life events. The social benefits of lifelong learning help to solidify and enhance the mental health benefits. Learners increase their self-esteem and self-efficacy in a highly supportive social environment.

Conclusion

The environment in a university setting fosters successful aging for members of lifelong learning institutes by encouraging high cognitive functioning through a variety of intellectually challenging opportunities. These opportunities in turn encourage interactions with others and promote engagement with life. Therefore, those who participate in campus events improve their likelihood of aging successfully.

REFERENCES

- A brief overview of the LLI movement.* (n.d.) Retrieved February 25, 2005 from <http://www.elderhostel.org/Ein/overview.asp>.
- Alvarez-Borda, B., & Nottebohm, F. (2002). Gonads and singing play separate additive roles in new neuron recruitment in adult canary brain. *The Journal of Neuroscience*, 22 (19): 8684-8690.
- Brady, E.M., Holt, S. R., & Welt, B. (2003). Peer teaching in lifelong learning institutes. *Educational Gerontology*, 29: 851-868.
- Campus dream.* (n.d.) Retrieved February 28, 2005 from http://www.aarp.org/learntech/lifelong/Articles/a2004-04-13-campus_new.html.
- Colcombe, S., Erickson, K., Rax, N., Webb, A., Cohen, N., McAuley, E., & Kramer, F. (2003). Aerobic fitness reduces brain tissue loss in aging humans. *Journal of Gerontology, Biological Sciences, Medical Sciences*, 58, M176-M178.
- Cusack, S. A. (1994, March). *Developing a lifelong learning program: empowering seniors as leaders in lifelong learning.* Paper presented at the 40th annual meeting of the American Society on Aging, San Francisco, CA.
- Cusack, S. A., Thompson, W. J. A., & Rogers, M. E. (2003). Mental fitness for life: assessing the impact of an 8-week mental fitness program on healthy aging. *Educational Gerontology*, 29: 393-403.
- Eriksson, P. S., Perfilieva, E., Bjork-Eriksson, T., Alborn, A., Nordborg, C., & Peterson, D. (1998). Neurogenesis in the adult human hippocampus. *Nature Medicine*, 4(11).

- Gage, F. H., Kelly, P. A., & Bjorkland, A. (1984). Regional changes in brain glucose metabolism reflect cognitive impairments in aged rats. *Journal of Neuroscience*, 4, 2856-2866.
- Iwanaga, M. (1994). Elderly students learning through the University of the Air system in Japan. *Educational Gerontology*, 20(5), 473-482.
- Kramer, A., Hahn, S., Cohen, N., Banich, M., McAuley, E., Harrison, C., Chason, J., Vakil, E., Bardell, L., Boileau, R., & Colcombe, A. (1999) Ageing, fitness and neurocognitive function. *Nature*, 40, :418-419.
- Lamb, R., & Brady, M. (2005). Participation in lifelong learning institutes: What turns members on? *Educational Gerontology*, 31, 207-224.
- Mehrotra, C.M. (2003). In defense of offering educational programs for older adults. *Educational Gerontology*, 29, 645-655.
- Mitchell, R. A., Legge, V., & SinclairLegge, G. (1997). Membership of the University of the Third Age (U3A) and perceived well-being. *Disability and Rehabilitation*, 19(6), 244-248.
- National Center for Health Statistics (2005). *Health, United States, 2005*. Online document available at [http://www.cdc.gov/nchs/data/05.pdf](http://www.cdc.gov/nchs/data/hus/05.pdf) Accessed 2005.
- Numan, R. (2000). Septal modulation of the working memory for voluntary behavior. In: Numan, Robert (Ed.), *The behavioral neuroscience of the septal region*. (pp. 298-326). New York: Springer-Verlag Publishing.
- Orte Socias, C., Ballester Brage, L., & Touza Garma, C. (2004). University programs for seniors in Spain: Analysis and perspectives. *Educational Gerontology*, 30, 315-328.
- Rosenzweig, R.R., Bennett, E.L., & Diamond, M.C. (1972). Brain changes in response to experience. *Scientific American*, 226, 22-29.
- Rowe, J., and Kahn, R. (1998). *Successful aging*. New York: Pantheon.
- Schaie, K.W., (1996). *Intellectual development in adulthood: the Seattle longitudinal study*. New York: Cambridge University Press.
- Shimamura, A., Berry, J., Mangels, J., Rusting, C., et al. (1995). Memory and cognitive abilities in university professors: evidence for successful aging. *Psychological-Science*. 6(5), 271-277.
- Snowden, D. (2001). *Aging with grace: what the nun study teaches us about how to lead longer, healthier, and more meaningful lives*. New York: Bantam.
- van Praag, H., Shubert, T., Zhao, C., Gage, F. (2005) Exercise enhances learning and hippocampal neurogenesis in aged mice. *The Journal of Neuroscience*, 25(38), 8680-8685.
- Wilson, J. D. (2001). Lifelong learning in Japan—a lifeline for a ‘maturing’ society? *International Journal of Lifelong Education*. 20(4), 297-313.
- Wilson, R. S., Mendes De Leon, C. F., Barnes, L. L., Schneider, J. A., Bienias, J. L., Evans, D. A., & Bennett, D. A. (2002). Participation in cognitively stimulating activities and risk of incident Alzheimer disease. *JAMA*, 287(6), 742-8.
- Yenerall, J.D. (2003). Educating an aging society: the University of the Third Age in Finland. *Educational Gerontology*, 29, 703-709.

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