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University of Missouri-St. Louis

From the Selected Works of John A. Henschke EdD

September 10, 2010

Lifelong Learning for Older Adult Learners

John A. Henschke, EdD



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Lifelong Learning
for
Older Adult Learners

By

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Presentation at

The 2010 International Literacy Day
Faculty of Education, Chulalongkorn University
Bangkok, Thailand
September 10th, 2010

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Selected Published Works of John A. Henschke

For complete details of his published works go to the following websites:

Andragogy Websites: <http://www.lindenwood.edu/education/andragogy.cfm>
<http://www.umsl.edu/~henschke>

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Today's Agenda

Time	Contents
08:10 – 08:15	Task Assignments
08:15 – 08:30	1. Beliefs & Notions about Older Adults as Learners
08:30 – 08:45	2. Perceptions Concerning the Qualities of Effective Teachers of Older Adults
08:45 – 09:00	3. Phases & Sequences of the Learning Process of Older Adults
09:00 – 09:15	4. Teaching Tips and Learning Techniques for Older Adults
09:15 – 09:30	5. Implementing the Prepared Plan of Teaching Older Adults
09:30 – 09:40	Wrap Up

①

Build a Notebook

- **How would you remember this item best?**
- **During the learning session:**
 - **Enter the item into a notebook [or folder]**
 - **In a way that makes most sense to you**

Building Blocks for Older Adult Learners



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④

*As you are readying yourself to teach older adults,
what would / do you focus on regarding:*

1. Beliefs & Notions about Older Adults as Learners?
2. Perceptions Concerning the Qualities of Effective Teachers of Older Adults?
3. Phases & Sequences of the Learning Process of Older Adults?
4. Teaching Tips and Learning Techniques for Older Adults?
5. Implementing the Prepared Plan of Teaching Older Adults

As you are readying yourself to teach older adults, what would / do you focus on regarding:

- **1. Beliefs & Notions about Older Adults as Learners?**



MATERIALS & METHODS

In Adult
and Continuing Education

INTERNATIONAL — ILLITERACY

Editor

CHESTER KLEVINS

TRAINING TEACHERS OF ADULTS414
John A. Henschke

KLEVENS PUBLICATIONS Inc.
Los Angeles

2

Training Teachers of Adults

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The adult continuing education literature and popular belief suggest that competence in subject matter has traditionally served as a sufficient qualification for individuals who teach adults. For most educators and trainers in programs serving adults, neither adult teaching experience nor formal preparation for teaching the adult learner is a requirement for obtaining a position. Many of the institutions conducting adult education programs have no requirement for teachers other than knowledge of the content of the subject to be taught. It is assumed by many that if one knows the content or subject matter, competence in teaching it to other adults is automatically included in that knowing.

Results of this process of teacher assignment has often led to dropouts in a wide variety of programs. While it cannot be assumed that everything lacking in a learning experience points to the teacher, teacher performance obviously has some responsibility.

The number of adults involved in learning experiences of one kind or another has recently risen exponentially: currently, 23 million Americans — 10 million more than 15 years ago. It is also known that adults as consumers of education or learning have become increasingly sophisticated in their knowledge of what constitutes good teachers. Furthermore, adults are for the most part voluntary earners and will disappear if their needs as determined by themselves, are not met in that educational or training program. In addition, even those adults who are required by some boss or employer to remain for whatever reason, will have psychologically "checked out" of the learning experience if their perceived learning needs are not met. Today's rapidly changing, technologically oriented society has created a need for teachers and trainers whose outlook reflects understanding and concern for the unique needs of the adult learner.

Many institutions have not been willing to insist that a teacher must become equipped for teaching adults by participating in a systematic training program; nor have they provided the opportunity for those teachers who would become involved willingly. This chapter is designed primarily to assist the non-experienced teacher of adults and, also, will be useful to those who have some experience and training in the field.

There are five important building blocks of a systematic training program for non-experienced teachers of adults:

1. Beliefs and notions about adult learners.
2. Perceptions concerning qualities of effective teachers.
3. Phases and sequences of the learning process.
4. Teaching tips and learning techniques.
5. Implementing the prepared plan.

The best results will be attained by making improvements on each building block as it applies to a specific teaching situation. Each step taken will lead to some improvement. The more steps that are taken, the more improvement will result.

I. BELIEFS AND NOTIONS ABOUT ADULT LEARNERS

The first building block seems to be a reflective starting point for the teacher. Who is this learner we call an adult? Many definitions are in current usage. The following descriptors adapted from the works of Malcolm S. Knowles⁶ and Frank Hoffman⁷ would seem to characterize the notion of the adult as a learner.

First, the adult learner has a concept of self that has the potential and desire for increasing self-directiveness which is interdependent and not in isolation. This means that in the learning situation the adult:

- | | |
|--------------------------------------|----------------------------|
| 1. Accepts and loves responsibility. | 4. Opens to opportunities. |
| 2. Orients toward the future. | 5. Solves problems |
| 3. Values initiative. | 6. Is creative |
| | 7. Context |
| | 8. Ideology |

The key for the teacher is to design programs to take advantage of the learner's potential and desire for increasing interdependent self-direction.

Second, as an adult learns, grows, and develops, he or she builds an increasing reservoir of experience. This experience becomes a vast resource to draw on for helping others to learn as well as advancing one's own learning. Thus, structuring the learning situation to take advantage of those resources should at least help to:

1. Create positive attitudes in the learner toward the instructor, one's self as a learner, the subject and learning situation, expectancy for success.
2. Relate the instruction to the learner's needs.
3. Increase stimulation of the learner's attention, awakens, awareness, interest, involvement, and interaction.
4. Encourage, optimize and integrate learner emotion.
5. Achieve the learner's progress toward self-chosen goals.
6. Reinforce learner participation, positive changes and continuous learning.

II. PERCEPTIONS CONCERNING QUALITIES OF EFFECTIVE TEACHERS

The second building block focuses upon the teacher. It is self-diagnostic. What are qualities of effective teachers? How do I measure up? Where do I need improvement? How will I accomplish that improvement? From David W. Cochran¹ and many other sources comes an overall picture of the abilities and qualities teachers need to help assure satisfactory learning by the learners.

7

QUALITIES OF AN EFFECTIVE TEACHER

1. **Interest in the Students and the Subject Being Studied.** Students are quick at determining how interested teachers are in them and the subject being taught. You can't have one to the exclusion of the other. Effective teachers demonstrate sincere concern and interest in their students' progress and well-being.
2. **Ability to Communicate Well.** Communication is the act of helping others learn concepts, skills and attitudes. Teachers communicate by speaking, listening and writing. Communication includes presenting material in a clear and straightforward manner using language and written materials geared to learners' comprehension levels. Since learning is an active process, communication methods used must actively engage students.
3. **Good Knowledge of the Subject.** Successful teachers and trainers have a thorough and comprehensive knowledge of the subject they are teaching. The expectation of students is that the teacher will be able to respond to their questions and help them develop their areas of interest. However, when challenged by a question, the teacher of adults needs to admit to not knowing the answer as well as expressing willingness to work with the student to find the answer.
3. **Prepared to Teach the Lesson.** Good teaching and good planning go hand in hand. Planning requires an investment of time. It should be a joint venture done with students so that their needs are addressed. The basic ingredients of planning are establishing goals, selecting techniques and materials to achieve these goals, and evaluating to see if the goals have been met.
4. **Enthusiastic.** Enthusiasm is catching. If one is deeply interested in a group of ideas, a set of facts, or a type of work, one is also more likely to get others interested. Enthusiasm is the natural celebration of the joy of learning a new bit of knowledge or a new skill. Students love enthusiastic teachers, and will as a result get "steamed up" about learning. It affords them the opportunity to explore new ideas and expand themselves in new directions with the support of a knowledgeable and exciting teacher.

Other qualities of an effective teacher would certainly include: Desire to Instruct, A Sense of Humor, Being Flexible, Tact, Patience, Using a Variety of Teaching Techniques, Sensitivity and Courtesy.

Using Figure 1, "map out" plans to make the improvements needed in your teaching practice.

III. PHASES AND SEQUENCES OF THE LEARNING PROCESS.

The third building block for equipping non-experienced teachers of adults is to focus on the various phases and sequential steps in the learning process. When learning is viewed as a learner merely absorbing a body of information, then teaching becomes the vehicle for "throwing" or "spraying" as much information as possible at the learner. However, when learning is understood as a process which has a number of manageable steps in which the learner becomes deeply involved, then teaching becomes the vehicle and road map for helping the

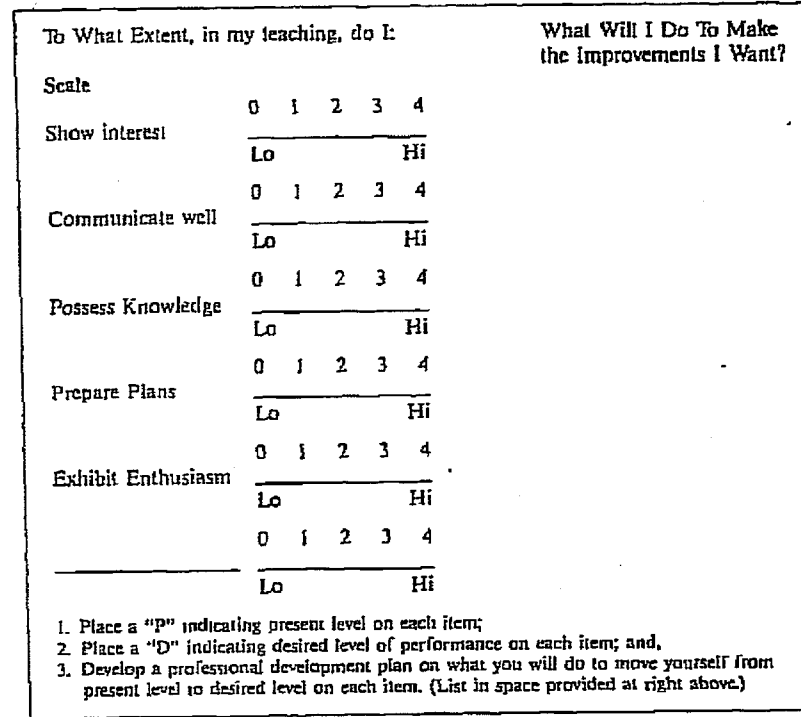


FIGURE 1

learner internalize, develop, practice, and refine proficiency in the application and use of that knowledge.

An interesting model which Cochran¹ has suggested is that the teacher keep the learners yearning, learning, earning, and returning. This means that the teacher needs to be a guide and:

1. Provide that for which the learner's Yearn, such as: new and advanced parts of the subject; developing a spirit of inquiry; another expert resource on the topic; reading and studying outside; being helped to find out answers to their questions.
2. Provide that which will help the learner's Learn, such as: incremental parts of the subject; using time well; classroom group involvement; being well prepared.
3. Provide that which will help the learners Earn.
 Success Praise Confidence Interest.



4. Provide that which will cause the learners to Return.
 - For enthusiasm. For finding sincere teacher interest.
 - For moving forward. For experiencing affirmation.
 - For sharing their learnings and progress.

Another way to look at the *learning process* may be portrayed through an adaptation of Gene Custer.²

1. Determine the content to be included.
 - Identify specific knowledge and skills to be taught.
 - Know who will be in the program.
 - Determine present level of performance.
 - Establish objectives.
 - Design performance test.
 - Determine learning points.
2. Determine learning techniques to be used.
 - Look at the task and the way results are achieved.
 - Determine learner's orientation — visual, auditory/verbal or physical.
 - Determine whether information is processed, learned, and applied, systematically or intuitively.
 - Determine whether learner motivation is low or high.
 - Select media and techniques.
 - Determine how to use the media and techniques.
3. Organize and develop the training presentation.
 - Organize and sequence content.
 - Design and develop handouts.
 - Develop plan for delivery.
4. Deliver the presentation.
 - Practice and time your presentation.
 - Do a pilot presentation.
 - Evaluate outcomes.
 - Save final materials for later use.

IV. TEACHING TIPS AND LEARNING TECHNIQUES.

The fourth building block for equipping non-experienced teachers is to make them aware that there are a multiplicity of teaching techniques and tips that will breathe life into a learning experience for participants. Some of the more familiar presentation techniques would be the lecture, reading, slides, audiocassette, motion picture, and demonstration. Certainly each of these approaches could be enhanced given a little thought. The lecture is the most frequently used technique for disseminating knowledge. It is a one-way organized communication of information by a resource person. To increase the interaction and enrich the internalizing of the information presented, listening groups could be formed before the lecture. Their purpose would be to listen to the lecture for things: (1) they wish clarified, (2) they want to take issue with, (3) they want to have elaborated, and (4) problems of practical application. After the lecture each group gets together to develop their questions. Then the lecturer responds to each question raised. Buzz groups of four to six people could also be formed to discuss particular issues

or ideas raised in a lecture by a resource person. Lectures could also be accompanied by overhead visuals, flip charts, filmstrips or newsprint to help learners grasp the information.

A motion picture and slides present information to participants through the ear and eye. Its message and purpose can be advanced by discussing in small groups of four or five people the meaning, application, and use in various situations and then sharing insights with the larger group. Another approach would be for the teacher to prepare specific questions to be discussed in small groups following the film.

Assigned or suggested reading material that is essential to developing understanding of an idea must be accessible and at a reading level the learner is able to comprehend. It is unrealistic to expect that the material will be read outside of class. Hence, a crisp printed outline of the main ideas or a series of questions, for which this material may provide answers, could improve the process of learning.

Audiocassettes have the advantage of being able to be listened to many times for a lecture message. If one has a cassette player, time that is otherwise spent listening to the radio or just in silence could be used to listen. As with the reading material suggestions above, a copy of the outline or appropriate probing questions should be advantageous to the learner.

A demonstration has the instructor verbally explaining and performing step-by-step, an act, procedure or process. One caution is that the instructor should make sure the participants can see as well as hear all that goes on.

Other techniques are group discussion which would have ten to twenty people discussing a problem for a fifteen to twenty minute period. Huddle groups of two or three people could discuss for a few minutes an issue raised.

A case study brings a small group of people together to analyze and solve a problem or a case situation. A simulation has the learners acquire skills in a setting that simulates the real setting where skills are required. A role play becomes an impromptu dramatization of a problem or a situation, followed by discussion. A teaching/learning team is a group of three to six people working cooperatively to teach and help others develop knowledge and skills.

Many more techniques are available and explained in the expanding adult education literature. In designing a learning experience, a variety of techniques need to be included that will enhance the interest and excitement of the adult learners as well as improve their knowledge, skill and attitude.

A quick way to determine the usefulness of any techniques for use in one's teaching practice would be to use Figure 2.

V. IMPLEMENTING THE PREPARED PLAN

The fifth building block for equipping non-experienced teachers of adults is the final step of conducting a program.

This is a most crucial part of the process. It seems that this step cannot be directly taught. It is not readily articulated, openly expressed or stated. It is unspecifiable. It is what Dirk³ refers to as "The Tacit Dimension of Practical Knowledge"

Techniques I Would Like to Use	Purpose For Which I Would Use This Technique	
	Yes	No
1. Lecture		
2. Listening Groups		
3. Buzz Groups		
4. Motion Picture and Slides		
5. Reading		
6. Audiocassettes		
7. Demonstration		
8. Group Discussion		
9. Huddle Group		
10. Case Study		
11. Simulation		
12. Teaching/Learning Team		

FIGURE 2

This is like an integration of the explicit and objective subject matter knowledge of one's practice into the personal constructions and performances of one's work. It is the developing of an intuition of what needs to be done in this specific situation to take the next step which will carry the learning forward. It is as though attitude is of utmost importance — attitude toward one's self, toward the great potential of adults as learners, the opportunity of being involved in turning the light on in their eyes:

- An attitude of being open to ideas that are different from those in the design.
- An attitude of caring and showing it.
- An attitude of treating adults as individual adults who are unique.
- An attitude of supportiveness toward learners.
- An attitude of considering the learning process as important.

Implementation is the creation of a climate which nurtures the seeds of adult learning into a glorious flower that flourishes. It is practical intelligence, practical reasoning, practice of the art of teaching adults which is different from talking about the rules of adult education. It is not just talking about adult education. It is doing adult education and doing it well. This comes from following our inner sense, honing the skill, and practice, practice, practice, until it is refined like a costly and precious gem.

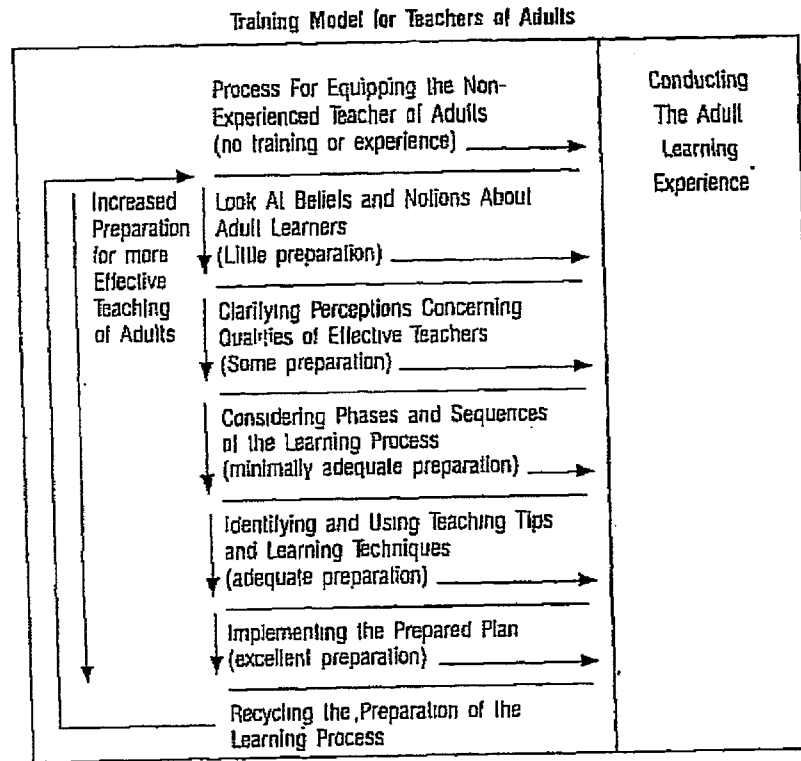


FIGURE 3

SUMMARY

The expansive growth of adult and continuing education has brought with it many teachers who have subject matter expertise but have not background, training or experience in teaching adults. Although there are many of these people who are naturally successful in teaching adults, others may need assistance in becoming equipped for effective teaching in an adult learning setting. Five important building blocks for beginning to equip non-experienced teachers of adults. (1) looking at beliefs and notions about adult learners; (2) clarifying perceptions concerning qualities of effective teachers; (3) considering phases and sequences of the learning process; (4) identifying and using good teaching tips and learning techniques; and, (5) implementing the prepared plan. Certainly there is not only one way to accomplish this task, however, this is an outline of one way to begin this important work.

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QUESTIONS AND EXERCISES

1. When you begin your next adult education class what procedures will you use to establish a climate of mutual respect, cooperation rather than competition, informality, supportiveness, warmth of relationship with you, etc.?
2. Prepare for your next adult learning program an outline of how you will engage students in examining, clarifying, and influencing the objectives of the course.
Acquaint them with your plan of work for the course and their responsibilities in it. Help them prepare to carry the responsibilities you expect of them. Make them aware of the material and human resources available for accomplishing their objectives.
3. It has been suggested that ninety-five percent of the teacher's preparation for teaching a course should be devoted to the procedures and only five percent on the content of the course. Do you agree or disagree? Explain why you agree or disagree. Refer to Figure 3.

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12

**TEACHING ADULTS AND NON-TRADITIONAL STUDENTS
IN VOCATIONAL EDUCATIONAL PROGRAMS**

Dr. John A. Henschke; Dr. Mary K. Cooper; Dr. E. Paulette Isaac

**Adult Vocational Education
Conceptual Framework**

ANDRAGOGY: The Art and Science of Helping Adults Learn

Assumptions:

Concept of the learner – As adults, we have a deep psychological need to be self-directing—to be perceived by others and treated by others as able to take responsibility for ourselves. When we find ourselves in situations where we feel others imposing their wills on us without our participation in making decisions that affect us, we feel resentment and resistance. Educators of adult learners need to know and use the strategies that have been developed for helping adults to make a quick transition from seeing themselves as being dependent learners to becoming self-directed learners.

Role of the learner's experience – Adults enter into an educational activity with a greater volume and a different quality of experience than youths. The greater volume is obvious—the longer we live, the more experience we accumulate. The difference in quality of experience arises from the different roles adults and young people perform.

This difference in experience affects the planning and conducting of an educational activity. It means that adults are themselves the richest learning resource for one another for many kinds of learning. Hence, the greater emphasis in adult education is on such techniques as group discussion, simulation exercises, laboratory experiences, field experiences, problem-solving projects, and interactive media.

The differences in experience also assume greater heterogeneity in groups of adults. The range of experience in a group of adults of various ages will be greater than with a group of same-aged youths. Consequently, adult education emphasizes individualized learning plans, such as learning contracts.

Readiness to learn – Adults become ready to learn when they experience a need to know or be able to do something to perform more effectively in some aspect of their lives. Among the chief sources of readiness are the developmental tasks associated with moving from one stage of development to another. Any change—marriage, the birth of children, the loss of a job, divorce, the death of a friend or relative, or a change of residence—can trigger a readiness to learn. But we don't need to wait for readiness to develop naturally. We can induce readiness by exposing learners to more effective role models, engaging them in career planning, and providing them with diagnostic experiences to assess the gaps between where they are now and where they want and need to be in terms of their personal competencies.

Orientation to learning – Because adults are motivated to learn after they experience a need, they enter an educational activity with a life-, task-, or problem-centered orientation to learning. The chief implication of this assumption is the importance of organizing learning experiences (i.e., the curriculum) around life situations, rather than according to subject-matter units. For example, instead of calling courses Composition I, II, III, they might be labeled as Writing Better Business Letters, Writing for Pleasure and Profit, and Improving Your Professional Communications in an adult education program.

TEACHING ADULTS AND NON-TRADITIONAL STUDENTS – page 2

Motivation to learn – Although the andragogical model acknowledges that adults will respond to some external motivators—for example, a chance for promotion, a change of jobs, or a change in technology—it proposes that the more potent motivators are internal—such benefits as self-esteem, recognition by peers, better quality of life, greater self-confidence, self-actualization, and so on. Adults may not be motivated to learn what we have to teach them. Consequently, educators of adults need to focus their efforts around how their subject matter relates to the internal motivators of adult learners that we just mentioned.

Why learn something – Adults have a need to know a reason that makes sense to them, as to why they should learn some particular thing—why they need to learn the subject matter the teacher has to teach them. Adults will expend considerable time and energy exploring what the benefits may be of their learning something, and what the costs may be of their not learning it before they are willing to invest time and energy in learning it. Therefore one of the first tasks of the educator of adults is to develop a “need to know” in the learners—to make a case for the value *in their life performance* of their learning what we have to offer. At the minimum, this case should be made through testimony from the experience of the teacher [who needs to become increasingly a facilitator of learning] or a successful practitioner; at the maximum, by providing real or simulated experiences through which the learners experience the benefits of knowing and the costs of not knowing. It is seldom convincing for them to be told by someone [like the professor] that it would be good for them.

There is a growing body of knowledge about how adults learn and a body of technology for facilitating learning, and this is changing the role of teacher/professor and requiring that he or she know things few professors/teachers know and probably none of his or her associates knows. In working with adult learners in educational contexts the professor must know, believe in and be skillful with *andragogy*—the art and science of helping adults learn—and how it differs from *pedagogy*—the art and science of teaching youth... This is the mark of a professional.

Teaching Technologies

Preparing the learners for the program/course – A most common introduction to the participants is sharing the purpose, objectives, meeting time and place, potential benefits, the participatory nature of the learning design so the adult learners develop some realistic expectations about how they will be involved, and things to think about such as what special needs, questions, topics, and problems they hope will be dealt with.

The first question an andragog asks in constructing a process design, therefore, is “What procedures should I use to help prepare the adult learners to become actively involved in this course and to meet their expectations?”

Setting the climate – A climate conducive to learning is a prerequisite for effective learning. Two aspects of climate are important: physical and psychological.

Physical climate – The typical classroom setup, with chairs in rows and a lectern in front, is probably the one least conducive to learning that the fertile human brain could invent. It announces to anyone entering the room that the name of the game here is one-way transmission—the proper role for the students is to sit and listen to the professor. The effective educator of adults makes a point of getting to the classroom well before the learners arrive. If it is set up like a traditional classroom, consider moving the lectern to a corner and rearrange the chairs in one large circle or several small circles. If tables are available, place five or six at a table. A bright and cheerful classroom is a must.

TEACHING ADULTS AND NON-TRADITIONAL STUDENTS – page 3

Psychological climate – Important as physical climate is, psychological climate is even more important. The following characteristics create a psychological climate conducive to learning:

- **A climate of mutual respect.** Adults are more open to learning when they feel respected. If they feel that they are being talked down to, ignored, or regarded as incapable, or that their experience is not being valued, then their energy is spent dealing with these feelings at the expense of learning.
- **A climate of collaboration.** Because of their earlier school experiences where competition for grades and the professor's / teacher's favor was the norm, adults tend to enter into any educational activity with rivalry toward fellow learners. Because peers are often the richest resources for learning, this competitiveness makes these resources inaccessible. There are climate-setting exercises that can be used to open courses which put the learners in to a sharing relationship from the beginning for this reason.
- **A climate of mutual trust.** People learn more from those they trust than from those they aren't sure they can trust. And here educators of adults [ones who seek to help adults learn] put in a position of teacher of adults, are at a disadvantage. Students in schools learn at an early age to regard teachers [and professors] with suspicion until teachers / professors prove themselves to be trustworthy. Why? For one thing, they have power over students; they are authorized to give grades, to determine who passes or fails, and they hand out punishments and rewards. For another thing, the institutions in which they work present them as authority figures. Professors will do well to present themselves as a human being rather than as an authority figure, to trust the people they work with and to gain their trust.
- **A climate of support.** People learn better when they feel supported rather than judged or threatened. Teachers of adult learners try to convey their desire to be supportive by demonstrating their acceptance of them with an unqualified positive regard, empathizing with their problems or worries, and defining their role as that of helper. It will help for professors to organize the learners into peer-support groups and coach them on how to support one another.
- **A climate of openness and authenticity.** When people feel free to say what they really think and feel, they are more willing to examine new ideas and risk new behaviors than when they feel defensive. If professors demonstrate openness and authenticity in their own behavior, this will be a model that the adult learner will want to adopt.
- **A climate of pleasure / fun.** Learning should be one of the most pleasant and gratifying experiences in life; it is, after all, the way people can achieve their full potential. Learning should be an adventure, spiced with the excitement of discovery. It should be fun. Dullness is the unacceptable part of the adult learners' previous educational experience, and the professor will improve the learning climate by making a lot of use of spontaneous [not canned] humor.
- **A climate of humanness.** Learning is a very human activity. The more people feel they are being treated as human beings, the more they are likely to learn. This means providing for human comfort—good lighting and ventilation, comfortable chairs, availability of refreshments, frequent breaks, and the like. It also means providing a caring, accepting, respecting, and helping social atmosphere.

TEACHING ADULTS AND NON-TRADITIONAL STUDENTS — page 4

The second question an andragog asks in constructing a process design is “What procedures should I use with this particular group to bring these climatic conditions into being?”

Involving learners in mutual planning — The andragogical process model emphasizes learners sharing the responsibility for planning learning activities with the facilitator. There is a basic law of human nature at work here: People tend to feel committed to any decision in proportion to the extent to which they have participated in making it. The reverse is even more true: People tend to feel uncommitted to the extent they feel that the decision or activity is being imposed on them without their having a chance to influence it.

The professor will increase learner commitment if they make clear they are coming in with a *process plan*—a set of procedures for involving them in determining the content of their study. Learners need the security of knowing that the professor has a plan, but even this process plan is open to their influence. It may be well to use teams of participants, with each team having responsibility for planning one unit of the course.

The third question the andragog answers in developing a process model, therefore, is “What procedures will I use to involve the learners in planning?”

Diagnosing their own learning needs — At the very simplest level, learners can share in small groups what they perceive their needs and interests to be regarding the acquisition of knowledge, understanding, skill, attitude, value and interest in a given content area of the course. One member of each group can volunteer to summarize the results of this discussion. This way, the learners will at least enter into the learning experience with some awareness of what they would like to get out of it. A learning need is not a need unless perceived so by the learner. It is possible to induce a deeper and more specific level of awareness by having learners engage in some of the new body of technology being developed for facilitating this process, with emphasis on such self-diagnostic procedures as in simulation exercises, assessment techniques, competency-based rating scales, and videotape feedback.

So the fourth set of questions the andragog asks in constructing a process design is “What procedures will I use in helping the participants diagnose their own learning needs?”

Translating the learning needs into objectives — Having diagnosed their learning needs, participants now face the task of translating them into learning objectives—positive statements of directions of growth. Some kinds of learning [such as identifying criteria for various steps in accomplishing a particular task] lend themselves to objectives stated as terminal behaviors that can be observed and measured. Others [such as decision-making ability] are so complex that they are better stated in terms of direction of improvement.

The fifth question the andragog asks is “What procedures can I use for helping involve the adult learner in translating their learning needs into learning objectives?”

Designing a pattern of learning experiences — Having formulated the learning objectives, the professor and the adult learner then have the mutual task of designing a plan for achieving them. This plan will include identifying the resources most relevant to each objective and the most effective strategies for utilizing these resources. Such a plan is likely to include a mix of total group experiences [including input by the professor], and subgroup [learning-teaching team] experiences, and individual learning projects. A key criterion for assessing the excellence of such a design is, “how deeply are the learners involved in the mutual process of designing a pattern of learning experiences?”

TEACHING ADULTS AND NON-TRADITIONAL STUDENTS – page 5

So the sixth question the andragog asks is “What procedures can I use for involving the learners with me in designing a pattern of learning experiences?”

Helping adult learners manage and carry out their learning plans – Learning contracts are a most effective way to help learners structure and conduct their learning. Students [adult learners] contract with the professor to meet the requirements of the university courses in which they are enrolled. [Incidentally, even though there may be a number of nonnegotiable requirements in university courses, the means by which learners accomplish the required objectives can be highly individualized.] Students going out on a field experience, such as a practicum or internship, will contract with the professor and the field supervisor. Contracts may also be specify how the learner is going to continue to learn on their own. Learning contracts are also used for continuing personal and professional development.

The seventh question that andragog asks is “What procedures can I use to make certain the learners are full engaged and involved with me in managing and carrying out their learning plan?”

Evaluating the extent to which the learners have achieved their objectives – In many situations institutional policies require some sort of “objective” (quantitative) measure of learning outcomes. However, the recent trend in evaluation research has been to place increasing emphasis on “subjective” (qualitative) evaluation—finding out what is really happening inside the learners and how differently they are performing in life. In any case, the andragogical model requires that the learners be actively involved in the process of evaluating their learning outcomes.

The eighth question, therefore, that the androgog asks is “What procedures can I use to involve the learners responsibly in evaluating the accomplishment of their learning objectives and meeting the course requirements?”

By answering these eight sets of questions, the professor [the facilitator of adult vocational learning] emerges with a *process design*—a set of procedures for facilitating the acquisition of the course content by the adult learner.

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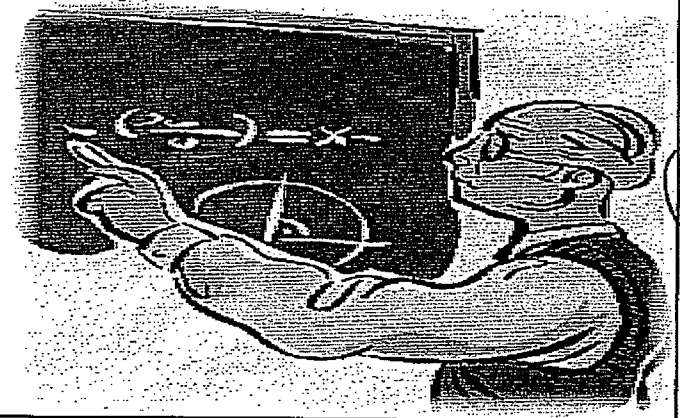
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As you are readying yourself to teach older adults, what would / do you focus on regarding:

- **2. Perceptions Concerning the Qualities of Effective Teachers of Older Adults?**



(19)

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The relationship among lifelong learning, emotional intelligence and life satisfaction for adults 55 years of age or older

by Reinsch, Elizabeth J., Ph.D., University of Missouri - Saint Louis, 2007, 182 pages; AAT 3269689

DISSERTATION CHAIR: JOHN A. HENSCHKE

Abstract (Summary)

The purpose of the study was to determine what relationship exists between lifelong learning, emotional intelligence and life satisfaction for older adult learners 55 years of age and older. The hypothesis is that life satisfaction increases with higher levels of emotional intelligence and more involvement in lifelong learning. The study was conducted primarily in the St. Louis metropolitan area. Two hundred and three adults 55 years of age or older participated. The convenience sample was voluntary and gathered from agencies and organization known to this researcher.

The study included three inventories: The Lifelong Learner Perspectives Inventory, the Emotional Skills Assessment Process Inventory and the Life Satisfaction Inventory. Collectively, these self-report inventories contained 98 statements on interpersonal communication, decision making, leadership, drive strength and self-esteem. They also include statements on trust is it relates to a person's perception of self as a learner, attitudes and beliefs related to involvement in educational activities, and life satisfaction.

Regression analysis was used to determine the relationships of lifelong learning perspective and emotional intelligence to life satisfaction. The control variables of age and living arrangement explained only 3 percent of the variance in life satisfaction (not statistically significant). In contrast, emotional intelligence and lifelong learning perspective accounted for a significant amount of the variance in life satisfaction (R^2 change = .26, p<.000), after controlling for age and living arrangement. Upon inspection of the regression coefficients for these variables, emotional intelligence was found to be the most significantly associated with life satisfaction (B = .516, p<.001). Lifelong learning perspective had a significant bivariate relationship with life satisfaction, and was also significantly related to life satisfaction, but not as significantly as emotional intelligence.

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Source type: Dissertation
Subjects: Adult education, Continuing education
Publication Number: AAT 3269689
ISBN: 9780549090884
Document URL: [http://proquest.umi.com/pqdweb?did=1383478741
&sid=1&Fmt=2&clientId=45249&RQT=309
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Lifelong Learner Perspectives Inventory

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Listed below are 11 statements reflecting beliefs, feelings, and behaviors that a lifelong learner may experience, while being involved in a learning project, in any situation. Please indicate how frequently each statement typically applies to you as a lifelong learner.

How frequently do I as a lifelong learner;

	Always	Sometimes	Never
1) Purposefully communicate to myself that I am uniquely important in any learning situation?	3	2	1
2) Trust myself to know what my goals, dreams and realities are like in learning?	3	2	1
3) Express confidence that I will develop the skills I need?	3	2	1
4) Prize my ability to learn what is needed?	3	2	1
5) Feel I need to be aware of and communicate my thoughts and feelings?	3	2	1
6) Able to evaluate my own progress in learning?	3	2	1
7) Have awareness and clarity regarding what my learning needs are?	3	2	1
8) Engage in clarifying my own aspirations in learning?	3	2	1
9) Develop a support of myself in learning?	3	2	1
10) Experience unconditional positive regard for myself in learning and education?	3	2	1
11) Respect my dignity and integrity in learning?	3	2	1

TOTAL SCORE _____

Modified Instructional Perspectives Inventory - Adapted for Students (MIPI-S)
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Listed below are 45 statements reflecting beliefs, feelings and behaviors beginning or seasoned teachers of adults may or may not possess at a given moment. Please indicate how frequently each statement typically applies to your instructor. Circle the letter that best describes the instructor.

How frequently does your instructor...	Almost Never	Not Often	Sometimes	Usually	Almost Always
1. use a variety of teaching techniques?	A	B	C	D	E
2. use buzz groups (learners placed in groups to discuss information from lectures)?	A	B	C	D	E
3. appear to believe that his/her primary goal is to provide learners with as much information as possible?	A	B	C	D	E
4. appear to be fully prepared to teach?	A	B	C	D	E
5. have difficulty understanding learner point-of-views?	A	B	C	D	E
6. appear to expect and accept learner frustration as they grapple with problems?	A	B	C	D	E
7. purposefully communicate to learners that each learner is uniquely important?	A	B	C	D	E
8. express confidence that learners will develop the skills they need?	A	B	C	D	E
9. show he/she values searching for or creating new teaching techniques?	A	B	C	D	E
10. teach through simulations of real-life settings or situations?	A	B	C	D	E
11. appear to teach exactly what and how he/she has planned?	A	B	C	D	E
12. notice and acknowledge positive changes in learners?	A	B	C	D	E
13. have difficulty getting his/her point across to learners?	A	B	C	D	E
14. appear to believe that learners vary in the way they acquire, process, and apply subject matter knowledge?	A	B	C	D	E

How frequently does your instructor...	Almost Never	Not Often	Sometimes	Usually	Almost Always
15. really listen to what learners have to say?	A	B	C	D	E
16. appear to trust learners to know what their own goals, dreams, and realities are like?	A	B	C	D	E
17. encourage learners to solicit assistance from other learners?	A	B	C	D	E
18. appear to feel impatient with learners' progress?	A	B	C	D	E
19. balance his/her efforts between learner content acquisition and motivation?	A	B	C	D	E
20. make her/his presentations clear enough to forestall all learner questions?	A	B	C	D	E
21. conduct group discussions?	A	B	C	D	E
22. establish instructional objectives?	A	B	C	D	E
23. use a variety of instructional media? (Internet, distance, interactive video, videos, etc.)	A	B	C	D	E
24. use listening teams (learners grouped together to listen for a specific purpose) during lectures?	A	B	C	D	E
25. appear to believe that his/her teaching skills are as refined as they can be?	A	B	C	D	E
26. express appreciation to learners who actively participate?	A	B	C	D	E
27. appear to experience frustration with learner apathy?	A	B	C	D	E
28. appear to prize the learner's ability to learn what is needed?	A	B	C	D	E
29. appear to feel that learners need to be aware of and communicate their thoughts and feelings?	A	B	C	D	E
30. enable learners to evaluate their own progress in learning?	A	B	C	D	E
31. hear what learners indicate their learning needs are?	A	B	C	D	E

How frequently does your instructor...	Almost Never	Not Often	Sometimes	Usually	Almost Always
32. have difficulty with the amount of time learners need to grasp various concepts?	A	B	C	D	E
33. promote positive self-esteem in learners?	A	B	C	D	E
34. require learners to follow the precise learning experiences which he/she provides to them?	A	B	C	D	E
35. conduct role plays?	A	B	C	D	E
36. appear to act bored with the many questions learners ask?	A	B	C	D	E
37. individualize the pace of learning for each learner?	A	B	C	D	E
38. help learners explore their own abilities?	A	B	C	D	E
39. engage learners in clarifying their own aspirations?	A	B	C	D	E
40. ask the learners how they would approach a learning task?	A	B	C	D	E
41. appear to feel irritation at learner inattentiveness in the learning setting?	A	B	C	D	E
42. integrate teaching techniques with subject matter content?	A	B	C	D	E
43. develop supportive relationships with learners?	A	B	C	D	E
44. appear to experience unconditional positive regard for learners?	A	B	C	D	E
45. respect the dignity and integrity of the learners?	A	B	C	D	E

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Instructional Perspectives Inventory Factors (Teachers)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
4	7	1	6	5	2	3
12	8	9	14	13	10	11
19	16	22	15	18	21	20
26	28	23	17	27	24	25
33	29	42	37	32	35	34
	30		38	36		
	31		40	41		
	39					
	43					
	44					
	45					
TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL

Scoring Process

A = 1, B = 2, C = 3, D = 4, and E = 5

Reversed scored items are 3,5,11,18,20,25,27,32,34,36,and 41. These reversed items are scored as follows: A = 5, B = 4, C = 3, D = 2, and E = 1.

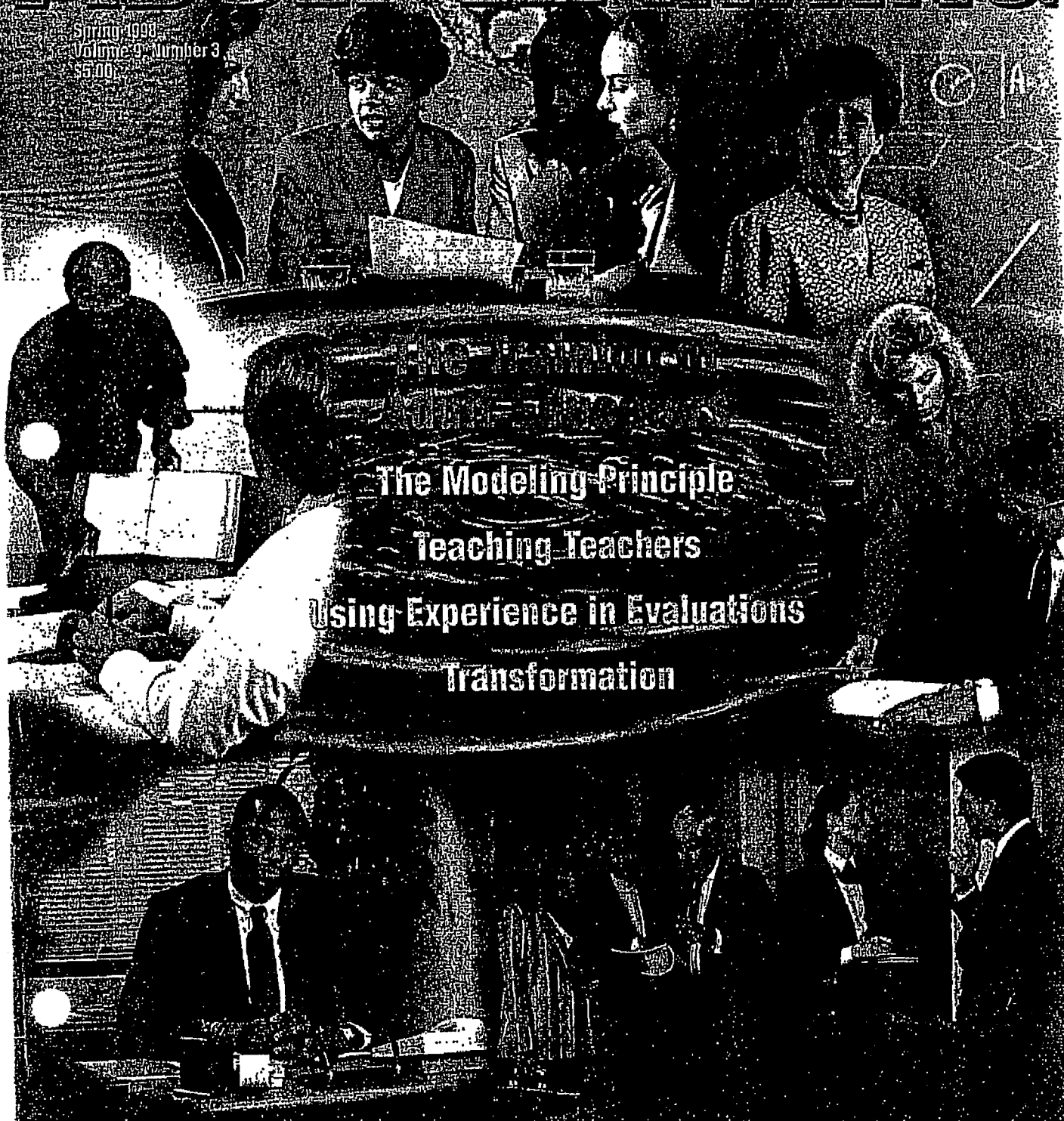
<u>FACTORS</u>	<u>MEAN</u>	<u>TOTAL</u>	<u>POSSIBLE MINIMUM</u>	<u>POSSIBLE MAXIMUM</u>
1. Teacher empathy with learners.	_____ = _____	_____	5	25
2. Teacher trust of learners.	_____ = _____	_____	11	55
3. Planning and delivery of instruction.	_____ = _____	_____	5	25
4. Accommodating learner uniqueness.	_____ = _____	_____	7	35
5. Teacher insensitivity toward learners.	_____ = _____	_____	7	35
6. Experienced based learning techniques. (Learner-centered learning process)	_____ = _____	_____	5	25
7. Teacher-centered learning process.	_____ = _____	_____	5	25

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ADULT LEARNING

Spring 1998
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Adult Learning (ISSN 1045-1595) is published four times annually by the American Association for Adult and Continuing Education, 1200 19th Street, NW, Suite 300, Washington, DC 20036-2422.

Subscriptions are \$29 per year in the U.S., \$34 in Canada and \$39 foreign (U.S. funds). AAACE members receive *Adult Learning* at the annual subscription rate of \$20 as part of their membership dues. For membership information, call (202) 429-5131.

Periodicals postage paid at Washington, D.C. Postmaster: send address changes to *Adult Learning*, 1200 19th Street, N.W., Suite 300, Washington, DC 20036-2422.

Back volumes are available from University Microfilms International, 300 North Zeeb Rd., Ann Arbor, MI 48106.

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Modeling the Preparation of Adult Educators

By John A. Henschke

W

hen we say "adult educators," we may indicate a broader range of individuals than one would think upon first consid-

eration. If adult educators are people who "help adults learn," then their ranks must include: (1) leaders in voluntary associations; (2) executives, training officers, supervisors and foremen in corporations; (3) teachers, administrators and group leaders in various educational institutions; and (4) program directors, writers and editors in educational areas of mass media; as well as (5) professional adult educators who have been prepared specifically for this vocation and make it their permanent career.

Other than those in the last group, most of the "adult educators" mentioned above have had little or no formal instruction to prepare them to "help adults learn." Some may have attended a preparatory workshop designed to help them understand how to teach adults. Others may have studied a book such as Robinson's *Introduction to Helping Adults Learn and Change* or Renner's *Instructor's Survival Kit*, or any of a number of quick learn-as-you-go guides.

Available to all "adult educators" are graduate courses and formal master's and doctoral programs in adult education. There are also programs of preservice

training for adult educators; training for part-time instructional staff, paraprofessional instructors of adults and volunteers; and continuing education in the professions. There is training in organizations; training of consultants; training in business and industry; and training of human resources development specialists. All of these approaches feature one or more persons who conduct preparatory activities with emerging educators of adults.

The Modeling Principle

Each of the above mentioned approaches to adult education has a unique validity. Yet I have observed, in almost a quarter of a century of preparing adult educators to help adults learn, that the validity of teaching ultimately derives from a single element: modeling.

Modeling, according to the dictionary, means providing an example worthy of imitation, a standard by which a thing can be measured. For an educator, that means exemplifying the lessons being taught. It means walking what you talk, not "Do as I say, not as I do."

If we look to ancient times, we may find Moses as a model prophet and law giver, Confucius as a model thinker, Abraham as a model of faith, Socrates as a model questioner, Jesus Christ as a model of forgiving

John A. Henschke is past-president of AAACE and associate professor of Education at the University of Missouri-St. Louis.

love, and Tullius Cicero as a model of eloquent oratory. Their personal influence is still pervasive in our time.

If we review the history of our nation, we may find George Washington to be a model of prudence, integrity and patriotism; Thomas Jefferson to be a model of learnedness; Teddy Roosevelt to be a model of courage, and Abraham Lincoln to be a model of honesty and justice. And we can see how their modeling of these virtues has helped shape the world we live in—as clearly as we can see their images carved into Mt. Rushmore.

As adult educators, we are models. Students learn more from our actions than our words. They want to see if our actions match our words. With this in mind, if we believe that adults learn in a certain way, then it follows that we take it upon ourselves to model the conduct and attitude that demonstrate and support what we're trying to teach them.

A guiding principle and statement in the University of Missouri-St. Louis, School of Education is: "If I am not modeling what I am teaching, I am teaching something else." One could also say: "If I am modeling what I am teaching, I am teaching what I am modeling." This principle is much like that of the Zaddik Rabbi, who says the personality of the teacher takes the place of the teaching—she or he is the teaching. For us, whose task is to help other adults learn, it means risking being ourselves, trusting our feelings and acting on them, thereby engaging a like commitment from our students.

An Outline for Modeling

There are certain ingredients that go into the making of a model. Understanding each of these ingredients can help us in our practice of modeling in the preparation of adult educators.

Andragogy. One ingredient is the theory of andragogy—the art and science of helping adults learn. Its primary principle is the desire, potential and ability for self-directedness on the part of the learner. Other principles include: perceiving the learner's

experience as a resource for learning, seeing developmental tasks of social roles as crucial in activating the need and readiness for learning, learners need a situation-centered or problem-centered orientation to learning, understanding that motivation of adult learners is internal rather than merely external, and learners need a valid reason why they need to learn something to appreciate its importance.



As adult educators, we are models.

Students learn more from our actions than our words. They want to see if our actions match our words.



I experienced these principles of andragogy in my studies at Boston University with Malcolm Knowles, who popularized the theory in the United States and has now passed the torch of leadership (modeling) in adult education to our generation. I've heard people say that Malcolm provided a set of injunctions from which we will gain benefit if we follow them, and that if a teacher has some notion of what Knowles is talking about, both learner and teacher will greatly benefit in a learning situation.

I have implemented these principles of andragogy in my own teaching of adult education and in working with master's and doctoral students at University of Missouri-St. Louis. Teaching the way I was taught has worked well for me, as I have seen many adult educators blossom and flourish in their research and practice.

Eduard Lindeman said that andragogy is the true method by which adults keep themselves intelligent about the modern world, and that its use would make a qualitative difference in the life of our time. He further

asserted the practical nature of andragogy: theory becomes fact, and words become responsible acts and accountable deeds.

Attitude. A second ingredient is attitude. Someone said that if andragogy is used only as a method for conducting learning activities, it may become mechanical and lose its dynamism. Andragogy is more than mere method; it is an attitude of mind and heart, and it becomes a transforming power and positive influence in modeling the preparation of adult educators. An attitude of caring for the learner as a valuable, unique person, and of helping the learner to accomplish his or her educational goals, is essential for an adult educator: it is like the warp and woof of an exquisitely beautiful cloth weaving.

Congruence. A third ingredient is congruence. In mathematics, if two numbers give the same remainder when divided by a given value, they are said to be congruent. In adult education, if we apply our andragogical principles consistently, we will achieve congruence with learners in the form of a mutual agreement of voluntary conformity. For that to happen, we must have congruence between theory and practice, even though we may think that's not very scholarly. Congruence of theory and practice need to be like two geometric figures exactly superimposed on one another, or like an architectural plan for a building and the actual building.

Trust. A fourth ingredient is trust. To be effective, an adult educator needs to have trust in the ability and potential of learners (emerging adult educators) to understand the learning process and make the right choices. Trust takes the form of:

- Purposefully communicating to learners that they are each uniquely important;
- Believing learners know what their goals, dreams and realities are like;
- Expressing confidence that learners will develop the skills they need;
- Prizing the learners to learn what is needed;
- Feeling learners' need to be aware of and communicate their thoughts and feelings;

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- Enabling learners to evaluate their own progress in learning;
- Hearing learners indicate what their learning needs are;
- Engaging learners in clarifying their own aspirations;
- Developing a supportive relationship with learners;
- Experiencing unconditional positive regard for learners; and
- Respecting the dignity and integrity of learners.

The adult educator must initiate trust with learners. If he or she effectively models the principles of adult education, learners have a golden opportunity to become great adult educators themselves. If trusted, the learners may learn something, which otherwise, they would have learned less well, more slowly, or not at all. A lack of trust seriously hampers the learning process.

The adult educator must initiate trust with learners.

Building blocks

I like to encourage emerging adult educators to focus on five building blocks: (1) beliefs and notions about adults as learners; (2) perceptions concerning the qualities of effective teachers/facilitators; (3) phases and sequences of learning process (theory of how learning takes place); (4) teaching tips and learning techniques; and, (5) implementation of the prepared plan. Modeling—*andragogy*: attitude, congruence, and trust—while using these building blocks, helps to move the preparation of adult educators full circle from concept to reality.

Summary

You may wish to incorporate other ingredients as part of modeling the preparation of adult educators—based on your experience, someone else's experience, or an interesting theory you've heard. In any case, my observations tell me that the aforementioned ingredients—*andragogy*, attitude, congruence, and trust—are basic considerations. I have found that it is possible to be yourself and to be congruent in a university setting without sacrificing academic quality or rigor. I have found this to be true in varying time-frames within non-academic settings as well, meaning that all people who "help adults learn"—not just professional adult educators—can use the modeling principle in the preparation of adult educators.

I agree with an adult educator friend of mine who said that if we model this thing we are talking about, we are going to get it right yet.

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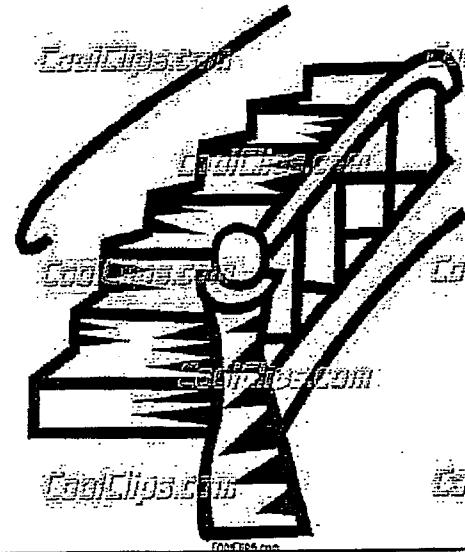
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As you are readying yourself to teach older adults, what would / do you focus on regarding:

- **3. Phases & Sequences of the Learning Process of Older Adults?**



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Assumptions of Andragogical Model of Learning

<i>About</i>	<i>Andragogical</i>
Need to know reason for learning something	Reason that makes sense to the learner
Concept of learner	Increasingly self-directing
Role of learner	Rich resource for learning by self & others
Readiness to learn	Develops from life tasks and problems
Orientation to learning	For immediate application
Motivation	By internal incentives, curiosity

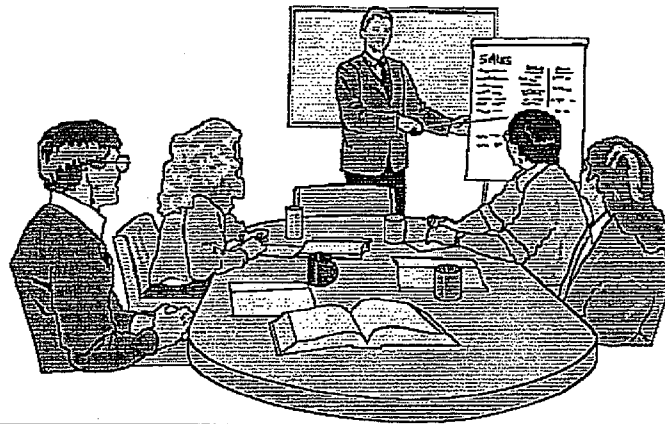
Process Elements of Andragogical Model of Learning

<i>Elements</i>	<i>Andragogical</i>
Preparation	Gain insight, understanding of what is to come
Climate	Relaxed, trusting, mutually respectful, informal, warm, collaborative, supportive, fun, openness, authenticity, humanness, and pleasure
Planning	Mutually by learners and facilitators
Diagnosis of needs	Mutual assessment by learners and facilitators
Setting of objectives	Mutual negotiation by learners and facilitators
Designing learning plans	Learning Contracts. Learning projects. Sequenced by readiness
Learning activities	Inquiry projects. Independent study. Experiential techniques
Evaluation	By learner-collected evidence validated by peers, facilitators, experts. Criterion-referenced

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As you are readying yourself to teach older adults, what would / do you focus on regarding:

- **4. Teaching Tips and Learning Techniques for Older Adults?**



FROM: THE MODERN PRACTICE OF ADULT EDUCATION
by MALCOLM S. KNOWLES (1980, pp. 236-237)

Components (Activity Units) of Learning-Design Models

A learning-design model is shaped by the arrangement of various types of activity units—the building blocks of educational architecture—in a pattern prescribed by the theme or process of the model. In keeping with the architectural analogy, this approach to the designing of learning is akin to the architectural doctrine that “form follows function.”

The following six types of activity units are available to model designers:

1. *General sessions.* Meetings of all participants as a whole, with a variety of patterns of platform presentation and audience participation as described under “Large Meetings” in Chapter 8.
2. *Small groups* of various sizes and for a variety of purposes, including:
 - Topical discussion groups:* groups organized for the purpose of reacting to, testing the meaning of, or sharing ideas about informational inputs from reading or speakers on given topics;
 - Laboratory groups:* groups organized for the purpose of analyzing group behavior, experimenting with new behavior, and sharing feedback regarding the effects of various behaviors;
 - Special-interest groups:* groups organized according to categories of interests of participants for the purpose of sharing experiences and exploring common concerns;
 - Problem-solving groups:* groups organized to develop solutions to procedural or substantive problems of concern to the total assembly;
 - Planning groups:* groups organized to develop plans for activities within the design or for back-home application;
 - Instructional groups:* groups organized to receive instruction through the services of resource experts in specialized areas of knowledge, understanding, or skill;
 - Inquiry groups:* groups organized to search out information and report their findings to the total assembly;
 - Evaluation groups:* groups organized for the purpose of developing proposals for evaluating the results of the activity for the approval of the total assembly and perhaps executing the approved plans;
 - Skill practice groups:* groups organized for the purpose of practicing specified categories of skills;
 - Consultative groups:* groups organized for the purpose of giving consultative help to one another;
 - Operational groups:* groups organized for the purpose of carrying responsibilities for the operation of the activity, such as room arrangements, refreshments, materials preparation, equipment operation, etc.;
 - Learning-teaching teams:* groups which take responsibility for learning all they can about a content unit and sharing what they have learned with the total assembly;
 - Dyads:* two-person groups organized to share experiences, coach each other, plan strategies, or help each other in any other way;
 - Triads:* three-person groups organized for mutually helpful purposes;
 - Buzz groups:* randomly organized groups of three or four persons that meet in a general assembly to pool problems, ideas, or reactions and report them through a spokesman to the assembly.
3. *Individual consultation, counseling, or directed study:* in which the services of resource persons are made available to individual participants for personalized help.
4. *Reading:* the scheduling of special times (between meetings) for reading handout materials or a selection of references.
5. *Recreation, worship, or meditation:* periods of time set aside for socialization, religious activity, or creative solitude.
6. *Preparatory activity:* things the participants are invited to do before the learning activity starts, such as reading, self-analysis, data collection, etc.

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THE MEANING AND LEARNING OF GREAT-GRANDMOTHERING

By Cordie Given Reese, Ed. D.
Professor of Nursing – St. Louis University

Doctoral Dissertation at University of Missouri-St. Louis, May, 1994
Dissertation Chair – John A. Henschke, Ed. D.

Some Exerpts From This Research

LEARNING BY GREAT-GRANDMOTHERS

Learning Domains – Spheres or Types

- I. Perceived Knowledge – Knowledge they perceived as necessary for successful functioning as a great-grandmother in a family.
 - Caring – helping each other, loving one another, working at the relationship.
 - Mutual Activities – taking part in common activities and having fun together.
 - Flexibility – patience, negotiation, being agreeable.

- II. Perceived Learning – Was of two types: Learning great-grandmothering and Learning something new.
 - Great-Grandmothering -- they never gave this type of learning any thought, but for them, learning to be a great-grandmother “just happened,” “came natural,” “picked it up on my own,” “just came to them,” or “it’s intuition.”
 - Learning Something New – clearly born, self-directed, experiential in which they identified five major topics: nutrition & health, world politics, learning activities & other interactive learning, practical everyday world events, self-reflective reading the Bible & praying.

III. Thinking Patterns – the processes they used in their thinking in the context of learning.

- Difficulty of Concepts – they had difficulty with reflecting on their thought processes, such as:
 1. describing how they learned to be a great-grandmother;
 2. comparing their childhood to that of their great-grandchildren; and,
 3. examining how they would prepare testimony to convince a judge to allow them visitation rights to their great-grandchildren.

- Problem-Solving Techniques – describing how they solved “everyday problems” [not “monumental”] they were forced to solve:
 1. dialogue – thinking which includes discussion of issues with others;
 2. context – thinking which recognizes that events are inextricably engaged in history and the environment;
 3. relativity – thinking that is aware of the connectedness of issues;
 4. facts as they evolve – thinking that allows for new facts and information as they became available in the solution of practical problems;
 5. reflection – thinking which includes contemplation on an issue;
 6. contradiction – thinking which recognizes and accepts contradiction as one aspect of wisdom;
 7. multiple perspectives – thinking which is able to view an issue from several points of view;
 8. reframing – thinking that redefines the issue in order to understand it better;
 9. intuition (tacit thinking) – thinking that is not overtly expressed or stated; and,
 10. relating to previous experience – thinking which compares and differentiates new experiences/problems from old experiences and structures the new experiences/problems based on the information from the old experiences.

- **Cultural Themes** – two themes emerged:
 1. **social learning** – (such as the learning of great-grandmothering) involved implicit, personal, and tacit learning; they learned it through the observation and mediation of the female members of their families, refined it through being a mother and grandmother, and continued to refine it in everyday practical situations with their great-grandchildren; and
 2. **goal-directed learning** – (such as learning ways to stay independent) involved explicit, self-directed learning, defining the information needed to solve a problem and specifying an explicit plan to gain the information.

From the Bestselling Author of *The Brain*

Older Wiser

How to Maintain Peak
Mental Ability for
As Long As You Live

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mental performance." —*Library Journal*

"Grounded in facts and studies...reassuring
upbeat." —*Publishers Weekly* (starred review)

RICHARD M. RESTAK, M.D.

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THIRTY STEPS
YOU CAN TAKE TO
ENHANCE YOUR BRAIN IN
THE MATURE YEARS

As a result of the research I carried out for this book, including many interviews with people who are aging successfully, happily, and creatively, I've developed a series of Pearls that can be applied in order to keep the brain operating at its optimum. Physicians refer to Pearls as bits of applied wisdom that can aid in the understanding of diseases and the treatment of patients. Although aging is not a disease but a part of the normal life cycle, it does take some thoughtful preparation in order to be navigated successfully. The following nuggets of applied wisdom and practical measures are based on well-founded principles that are unlikely to change very much, whatever scientists may discover in the future about aging and the brain. These Pearls can and should be applied *now, whatever your age,*

in order to achieve a richer, more fulfilling late adulthood marked by healthy brain functioning.

1. The mature brain is neither better nor worse than the brain in earlier years of development. It is just different. It is important therefore to understand and accommodate yourself to these differences.

2. So far, the only tried and true life-span-enhancing efforts are these: stop smoking; fasten automobile seat belts; engage in weight-bearing exercises daily. At the moment there are no foods, chemicals, or drugs that have been convincingly guaranteed to prolong life in humans.

3. Keep up good physical health. Maintain normal levels of blood pressure, blood sugar, and cholesterol. If medications are required to control these factors, take the drugs according to your doctor's prescription. Good control with or without medications lessens the risk of stroke, diabetes, and other conditions that compromise the supply of oxygen and blood sugar going to the brain.

4. Immobilization and physical inactivity are to be avoided at all costs. Some form of gentle stretching exercise is an excellent health promoter. As mentioned earlier, tai chi is an excellent conditioning activity to improve balance and mobility. Equally important are various weight-bearing exercises like weight lifting and walking. To be avoided as *first-time* activities later in life are potentially harmful sports activities that emphasize rapid, highly coordinated responses, such as downhill skiing, gymnastics, and most competitive ball games. Of course,

any or all of these activities can be continued later in life if they have been part of one's activity and exercise pattern earlier in life.

5. Exercisers are fine for cardiovascular fitness but are not helpful for building up bone and preventing osteoporosis. Sitting on an Exercycle isn't nearly as effective as another cardiovascular-enhancing exercise done while standing, for example, rapid walking outdoors or along a treadmill.

6. Make a firm commitment to walking at least four hours a week. This will cut by 25 percent your chances of dying over the next four years, in comparison to those who don't walk. Although there are no proven effects on brain function from a walking regimen, such a program will help indirectly by the proven beneficial effect on the brain of increasing HDL ("good" cholesterol), lowering blood pressure, and reducing weight. In response to requests for guidelines on how long it should take to walk one mile, Dr. James Rippe, associate professor of medicine at the Tufts University School of Medicine, has drawn up the following table listing the time it should take a person to walk a mile at different ages. These are only suggested guidelines, not mandates. Your goals may be more or less ambitious according to your personal health status. When in doubt, consult your doctor. Also start slowly and work up gradually to the suggested level of performance.

7. The best single exercise that can be done anytime and without any special equipment involves nothing

<i>Men 50 to 59</i>	<i>15:36 to 17:00 minutes</i>
<i>Men 60 to 69</i>	<i>16:18 to 17:30 minutes</i>
<i>Men 70 to 79</i>	<i>20:00 to 21:48 minutes</i>
<i>Women 50 to 59</i>	<i>14:24 to 15:12 minutes</i>
<i>Women 60 to 69</i>	<i>15:12 to 16:18 minutes</i>
<i>Women 70 to 79</i>	<i>15:48 to 18:48 minutes</i>

more elaborate or complicated than standing on one foot for as long as possible and then switching to the other foot and doing the same thing. This seemingly simple exercise combines muscle strengthening, balance, and flexibility. The only requirements are (1) *start off slowly* (no more than fifteen or twenty seconds in the beginning) and (2) do it close to a wall, furniture, or some other *source of support* until you build up some experience with the exercise and become less likely to lose your balance and fall. I first learned of this exercise from discussions with Chinese doctors who told me that all patients in the hospitals in China who are capable of supporting their own weight are encouraged to get out of bed every day and stand by their bedside for three to five minutes. Those well enough and strong enough are then asked to do the weight-shifting part of the exercise. With time and practice this simple exer-

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cise can be increased to fifteen minutes at a time on one leg.

8. Reduce stress. The best way of doing this is by mentally reformulating everyday frustrations and problems into challenges. Think: What can I learn from this experience? Such reformulations give you more feeling of control; and the more you perceive yourself in control, the less likely unwanted experiences will be perceived as stressful. As a last resort, remember: even in an instance where you cannot change what's happening to you, you can always change your inner attitude toward it.

9. A slowing of the speed of general responsiveness is an inevitable result of aging. But this is not an occupational handicap, since experience can moderate the influence of slowing on work performance. In the professions such as law and medicine, rapidity of response plays almost no part: the courtroom and the consulting room provide plenty of time for the exercise of wisdom accumulated over a long career. The same holds true elsewhere in the workforce. An experienced waiter will usually outperform his younger counterpart because he has learned to conserve his physical and mental energy by means of informal memory aids and a nicely balanced attention to the needs of customers at his different tables. "Large affairs are not performed by muscle, speed, nimbleness, but by reflection, character, judgment. In age, these qualities are not diminished but augmented," wrote Cicero in *De Senectute*.

10. Physiological measurements confirm what older persons experience every day: decreased levels of energy in the mature years. Often the only difference between the brain functioning of youth and old age is the amount of energy required to generate enthusiasm and get oneself up and going. This may be subjectively experienced as a lack of enthusiasm: a feeling that a visit to a friend or attendance at an event isn't worth the effort. The good news is that the brain can be energized via the deliberate cultivation of curiosity. On the basis of my interviews and discussions, I have become convinced that curiosity is the mental trait most linked with superior brain functioning over the life span. The mentally healthy person of whatever age is deeply interested and curious about the people and events around him or her. Earlier in life such curiosity often comes naturally; in the later years it must often be deliberately cultivated. Read over again the comments of Art Buchwald and Olga Hirshhorn about the importance of curiosity and involvement.

(P.53)

(P.54)

11. A related point about energy: caffeine and other stimulating drugs (available by prescription) can make more energy resources available in times of decreased enthusiasm and energy reserve. We often forget that caffeine is an energizing drug that alerts the brain, improves concentration, and provides renewed energy. Amphetamine is another energy booster that in moderation and under a physician's direction can counteract the effects of lowered neurotransmitter levels in the brain's subcortical circuits, the "juice machines."

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One more point about energy: learn the art of napping for short periods during the day. Contrary to standard but mistaken medical advice, napping does not interfere with nighttime sleep. Sleep researchers have discovered that naps do not serve to compensate for unmet sleep needs but, instead, provide a temporary respite from the day's activities and lead to improvements in energy, alertness, and mood.

12. Anyone over 50 years of age regularly experiences momentary lapses, when a name or specific word is just "on the tip of the tongue" and yet cannot be recalled until later. Such experiences are no cause for concern. Moreover, fretting about this perfectly normal age-associated memory impairment (AAMI) only makes things worse, since anxiety also interferes with recall. Healthy adaptations to AAMI include reading and utilizing the principles espoused in a memory training book such as *The Memory Book* by Harry Lorrayne and Jerry Lucas. Another useful tool is palmtop computers. They are small enough to be carried in a pocketbook and yet are powerful enough to hold several volumes' worth of information. (These include the Wizard or Taurus by Sharpe, the Hewlett-Packard Palmtop PCs, and my personal favorite, the Psion 3a by Psion Inc.)

13. Even in the presence of some degree of memory impairment, dementia is unlikely. A diagnosis of dementia requires impairments in memory plus at least one more brain function, such as language, thinking, or conceptualization. So don't waste time and energy worrying that you are becoming senile. Of course, if memory problems

are interfering with your life or leading to conflicts with other people, you should seek consultation with a neurologist. Reversible causes for memory failures exist and often can be successfully treated.

14. Rather than worrying about dementia, take specific steps to make it less likely. One way to do this is to keep working as long as possible (assuming you are reasonably satisfied with your occupation or profession). In addition, avoid the six factors shown to be associated with increased likelihood of dementia: low levels of physical activity, failure to retain a high degree of finger dexterity, less-frequent opportunities to converse, too much empty spare time, a decreased number of friends, excessive use of alcohol.

15. Your attitudes and activities over the next five minutes can exert more of an influence on your brain power than your genetic inheritance. You can enhance brain performance and health by choosing to stimulate and challenge your brain: pick up that newspaper and do that crossword puzzle now.

16. Keep a diary of your daily activities, your thoughts, your daytime fantasies, and your nighttime dreams. This not only is another continuity enhancer but serves as a means of learning the patterns and habits that govern your life. What did you do and what were your thoughts during that blizzard last January? Six months later, while sitting in the sun on your deck reading your diary entries (perhaps interspersed with some snapshots you took at the time), you will enjoy not only pleasure but

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needed linkages of present to past. Essentially, the "old age of the mind" consists in meaninglessness and the absence of continuity. You can prevent meaninglessness by using your diary. If writing doesn't appeal to you, you can also use one of the palmtops mentioned in Pearl 12 instead. If you do so, however, be sure to protect your privacy by not leaving the palmtop lying around for prying eyes to see. Also, regularly back up your entries by downloading the information on one of the solid-state discs that can be purchased for each model.

17. Take the same attitude toward your social life as you do toward your investments: diversify rather than invest everything in a single area. Gerontologist Gene Cohen suggests that mature people should develop a "social portfolio" divisible into four areas. Included under *active group activities* are such things as dance and tennis, which involve high energy and high mobility. *Passive group activities* are low-energy and low-velocity and include things like volunteerism, art classes, and game clubs. *Individual active activities* are also high-energy and/or high-mobility, such as nature walks or jogging. *Individual passive activities* are low-energy and low-mobility and include reading, writing letters, cooking, or working on a crossword puzzle. Since social isolation and loneliness can exert such destructive effects as one grows older, participation in both active and passive group activities becomes particularly important.

18. If you're not computer literate, take some lessons that provide you with the necessary background to get on the Internet. Most newspapers print classified ads by

computer specialists offering basic instructions. While the Internet is not a substitute for real-life social relations, it can counter feelings of loneliness and isolation. "Going on-line allows you to be intellectually mobile and be socially mobile," says Mary Furlong, founder of a group called SeniorNet. As an example of Ms. Furlong's point, an elderly widower who had played bridge with his wife for the forty years before her death joined a bridge group on the Internet. Now he's playing with enthusiasts all over the world. Next winter he is signed up for a bridge cruise in the Caribbean, where he will meet many of his new friends face-to-face. For him the Net provided not only a means of keeping his mind focused and sharp but an opportunity to form new friends in the process.

19. Seek out opportunities for sensory stimulation. The maintenance of visual and other sensory acuity is linked with retained physiological and psychological integrity of the brain. Go to the museum and look for extended periods at a picture by Monet. What was he seeing when painting water lilies? Or listen to a CD recording of Glenn Gould playing the *Goldberg Variations*. Figure out for yourself what Gould meant when he described this work as a "vision of subconscious design exulting upon a pinnacle of potency."

In addition, take adult education courses in new and unfamiliar subjects whenever possible. They are likely to be as protective of healthy brain functioning in the mature years as the formal education attained earlier in life. In one study of centenarians, the formal average

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educational level was only 5.8 years. There is no reason for discouragement, therefore, if you ended your education prematurely. Education is a lifetime activity, and the benefits don't stop at the conclusion of high school or college.

20. With age, the brain suffers a loss in its capacity for sustained concentration, with the upper limit being about fifteen minutes. This curtailed concentration time is not abnormal. Concentration difficulties are encountered elsewhere along the life span (for example, in children, particularly children with hyperactivity). Nor does a shortened concentration time preclude any type of intellectual pursuit. What it does require is that as you get older you divide your periods of active mental work into fifteen-minute sessions broken up by a distraction period of between three and five minutes. During these breaks some people simply close their eyes and rest. Others turn to something routine that doesn't require any concentration, such as a phone call to place an order. Others find some type of short physical activity best, such as walking to the corner to mail a letter. The important thing is that any period of sustained mental activity be briefly interrupted every fifteen minutes.

21. When facing mental challenges, go slowly, check your work, draw on your years of experience, and rely less on your speed of response. Reaction time lengthens with age. But that small liability can almost always be compensated for by wisdom and accumulated life experience.

22. Games like bridge, chess, and bingo help maintain sharpness in different mental domains. Bridge and chess involve working memory, reasoning, attention, and timing. As mentioned earlier, no age-related differences were found on measures of thinking and memory in bingo players—a strong recommendation for bingo as a means of providing positive benefits for older players. As mentioned in Pearl 20, focus and concentration often suffer because of a greater susceptibility to distraction. Playing chess, bridge, or bingo on a regular basis can counter this tendency, since all three of these games involve situations that call for sustained concentration under conditions of high arousal.

23. Try to retain a sense of humor. Humor scores highly among traits contributing to longevity. Taking oneself too seriously not only leads to unfortunate consequences when it comes to friends (no one likes spending time with people who lack a sense of humor) but leads to increased illness, disability, and a premature death.

24. Do everything you can to keep up your present friendships and strike up new ones. The brain is an inherently social structure that works on the microscopic scale via the interaction of billions of connections. On the macroscopic scale, we are the mirror images of that connectivity and flourish best when we interact meaningfully and emotionally with other people. Remember the advice of Arlene, who recovered from her depression by following these rules: "Take an interest in other people and keep abreast of what is going on in their world."

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Exercise and go out for a walk every day, even if it's only for a little while. Try to have a number of friends, and try to be a good friend. Keep up your physical appearance, because if you feel you look good, you will have more confidence and will be better able to meet people and make new friends."

Make special efforts to keep up your contacts with younger people. This is important because it provides continuity with the issues that occupied your earlier years (work, child care, housing, the quality of the schools). Your sense of humor is particularly important here since some younger people may, out of their own fears of aging, try to keep you at a distance.

As a correlate and help to fulfilling this Pearl, try to maintain a nonjudgmental attitude toward the people and events around you. This doesn't mean relinquishing moral and ethical principles. Rather, a nonjudgmental attitude prevents you from prematurely narrowing your interests. As one older college professor told me during our interview, "So many people decide what interests them and what they can and should do, and therefore close their minds off to things that may teach them a lot." Remember: life is a full-time, extended learning experience. Don't cheat yourself by prejudging what is and is not worth learning.

25. Loneliness is the greatest challenge to be overcome as you advance toward the mature years. Loss and a certain degree of isolation are inevitable. Rather than denying loneliness, try to build up your tolerance for

being alone. This doesn't contradict the recommendations of Pearl 24 about social involvement, but complements them: only by being comfortable with yourself and finding pleasure in your own company can you be pleasurable company for someone else.

If you live alone, consider getting a pet. Pets can do a lot for assuaging the pangs of loneliness and reducing the risk of depression. Although there are more pet cats than dogs in the nation (63 million cats, 54.2 million dogs), a dog might be a better choice. For some reason a dog confers greater protection against loneliness than a cat—perhaps because dogs have to be walked, and walking brings the owner into contact with other dog owners. Another factor: physical exertion and exercise combat feelings of loneliness, and dog owners report taking twice as many daily walks as nonowners. According to a study done at the School of Veterinary Medicine, University of California, dog owners voice less dissatisfaction with their social, physical, and emotional states. But whatever pet you choose, interaction with the animal is likely to decrease your blood pressure and pulse rate. Pet owners also are more likely to be alive one year after a heart attack than people who do not keep a pet. My guess is that these health benefits from pet ownership result from the socialization that results from owner-pet interaction. Almost all pet owners talk discursively to their pet, confide in their pet, and generally feel bonded to the pet. Conversations with other pet owners consist almost entirely of pet-related topics—further enhancing the socialization among pets and pet owners. The end

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result of all of this is a decrease in isolation and an enhancement of the limbic system and other brain circuits involved in emotion.

26. Diet. Your best chance for increasing your functional life span (period of healthy productive life) is by reducing the damage done by free radicals. This can be accomplished by (a) moderate caloric restriction, (b) decreased eating of foods that tend to increase free-radical reaction levels, for example, copper, polyunsaturated fats, or easily oxidized amino acids, (c) increasing your ingestion of foods containing effective natural free-radical reaction inhibitors (fruits and vegetables like cabbage, cauliflower, and carrots).

Radical caloric restriction does not make sense as an antidote to aging. What's best is a nutritionally balanced diet that enables you to maintain your weight at about the average for age and height.

Vitamins are probably not necessary to a healthy mental functioning, and some of them may in fact be harmful. Fresh foods contain vitamins in shelf-stable and shelf-unstable forms naturally balanced against one another. But only the shelf-stable forms are put in vitamin supplements, thus skewing the natural balance. Research by Dr. Victor Herbert, professor of medicine at Mount Sinai School of Medicine in New York, shows that ingesting only one form of nutrient is not beneficial—and can even worsen general health by triggering heart disease, cancer, and liver and kidney damage. Nor do the vitamin supplements provide the many other micronutrients present in food substances that may in fact be just as

important for good health as the vitamins themselves. The best approach is to gain needed nutrients from food—at least five servings daily of fruits and vegetables. (One serving equals one piece of large fruit or about one-half cup of vegetables or berries.) If you insist on vitamins, then stick to recommended doses of vitamin pills containing inhibitors of free-radical reactions (vitamins E, A, and C).

Zinc deficiency is common with increasing age. This deficiency leads to disturbances in several zinc-dependent functions such as wound healing, skin-cell turnover, taste acuity, and immune efficiency. These are all factors that as a rule are depressed in older people. In many instances, these age-dependent falloffs in performance can be reversed by zinc supplements. Several over-the-counter vitamins contain zinc in amounts well in excess of minimum daily requirements.

Dietary calcium should be taken by women starting in their twenties. Osteoporosis is a leading killer and disabling of women in their later years: 50 percent of women who enter a nursing home with a broken hip never leave that nursing home alive. If osteoporosis can be delayed three years by lifetime dietary calcium supplements, the life span of many women can be extended into the eighties.

27. If you are a woman and have entered menopause, supplementary estrogen should probably be taken. Exceptions may exist for women who come from families with a history of breast and uterine cancer. Estrogen not only serves as a protectant against heart and other

degenerative diseases but, scientists suspect, can prevent the onset of dementing illnesses like Alzheimer's.

28. Melatonin may make sense for nighttime sleep disturbances, but no convincing research exists that it exerts any positive effect on longevity. In regard to vitamins and longevity, no evidence exists that vitamin E helps; beta-carotene may be harmful; vitamin C exerts positive effects on general health but not necessarily longevity.

29. DHEA looks promising as an antiaging agent, and I urge you to follow research findings over the next several years. Health benefits in humans have already been demonstrated, and so far no overwhelmingly negative side effects have emerged. But as endocrinologist John Nestler mentions, it may not be reasonable to take DHEA now. But if you're over 65 you may be willing to take the risk. As William Regelson, the foremost proponent of DHEA, puts it, "I'm 70 years old. I don't want to wait twenty or thirty years. I want it *now*."

30. Alcohol can be taken in moderation. But monitor very closely how much you are actually drinking. As discussed earlier, alcoholism can develop late in life even among people who had no problem with alcohol when they were younger. Never drink when alone, before the late afternoon or early evening, and never as a means of combating loneliness, anger, or other uncomfortable emotions.

The Bottom Line

Aging can be thought of as the result throughout the body of a general wear-and-tear process. In all body organs except the brain, increased activity leads to more wear and tear and accelerated degeneration. But in the brain, the principle of operation is unique. Activation of nerve cells doesn't lead to a general degeneration of function but, instead, to the maintenance of neurons during normal aging. This is really quite an extraordinary situation if you think about it: the brain, in contrast to every other organ in the body, has the potential to *improve* with use and to keep that edge into the ninth decade and beyond.

Why does the brain work better the more it is used? Some neuroscientists believe this enhanced performance results because neuronal stimulation induces protective mechanisms such as DNA repair within neurons. Others emphasize the role of brain circuits: the connections between neurons. Each time the circuit is used, the connections become stronger and more easily facilitated. New activities and learning experiences establish new circuits and favor the survival of all of the neurons involved in the circuit. But whatever the mechanism, this "Use it or lose it" principle helps explain why nerve cells degenerate as a result of disuse in unhealthy aging but continue to function normally in robust aging. This same principle explains why recovery of various neuronal systems during aging can often be achieved by renewed stimulation. The situation is no different from what happens during physical training: muscular exercise results in increases in mass

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and strength, whereas inactivity leads to atrophy and muscle weakness.

Moreover, activation of brain cells and circuits provides a means of prolonging the brain's optimal functioning for the full length of our natural life span. From this it's fair to conclude that, barring health problems, the state of our brain during the mature years determines how long we will live. The Dutch Longitudinal Study Among the Elderly followed 211 Dutch people aged 65–84 years over an eight-year period. In those 70 years or older, the greater the decline in mental functioning, the shorter the life span. The investigators concluded that the “rate of decline of cognitive function is an independent predictor of longevity in older persons.” This rule is valid even among people with Alzheimer's disease: the worse the mental impairment, the shorter the life span. Thus all of us face the same challenge: if we fail to employ our brain in varied and challenging ways, our very survival is threatened.

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The take-home message when it comes to the brain? *Your brain: use it or lose it.* Indeed, it was my discovery of the intimate interplay of brain health, enhanced mental functioning, and longevity that stimulated me to write this book. After my research and interviews I became convinced—and I hope by now I have convinced you—that when it comes to longevity the brain is not just one organ among many but *the pivotal determiner of how long we will live.* Thus, providing our brain with challenges and stimulation is not only desirable but mandatory if we wish to enjoy a long and healthy life.

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ADVICE FOR SUCCESSFUL AGING

During research for *Older and Wiser*, I interviewed many people who are aging successfully and asked them what advice they would give to others. My interviewees were all 70 years of age or older and still productive. I asked that their advice not involve obvious impracticalities for the average person.

My subjects included

Art Buchwald (73), nationally syndicated columnist and author of many books, including his autobiographical works *Leaving Home* and *I'll Always Have Paris*.

Morris West (80), author of twenty-seven novels, including *The Shoes of the Fisherman* and, most recently, *Vanishing Point*. A past recipient of the Royal Society of Literature Heinemann Award, he is currently at work on the fourth novel in his *Papacy* series.

Harriet Doerr (86), winner of the National Book Award for her novel *Stones for Ibarra*. She started writing at age 65 and, despite a severe late-life-onset visual handicap, continues to

produce novellas and short stories. *The Tiger in the Grass: Stories and Other Inventions* was published in 1995.

Charles Guggenheim (71), documentary filmmaker and winner of four Oscars during his career. His works include *Nine from Little Rock*; *Robert Kennedy Remembered*, and *A Time for Justice*.

C. Vann Woodward (88), one of the nation's most respected and prolific historians. Now retired from a teaching career at Johns Hopkins and Yale University, he serves as the general editor for the *Oxford History of the United States*, published by Oxford University Press.

Irving Kristol (76), cofounder and editor with Stephen Spender of *Encounter* magazine, a fellow of the American Academy of Arts and Sciences, and currently coeditor of *Public Interest* magazine and publisher of *National Interest* magazine. He is also a director of the Dreyfus Money Market Instruments, Inc.

Daniel Schorr (80), journalist and commentator for National Public Radio.

Olga Hirshhorn (75), one of the world's most famous art collectors. Her *Olga Hirshhorn Collects: Views from the Mouse House* was featured in 1995 at the Corcoran Gallery of Art in Washington and served as a preview of the seven hundred works in her collection that she has bequeathed to the Corcoran.

Chalmers M. Roberts (85), chief diplomatic correspondent for the *Washington Post* until 1971. He continues to contribute occasional pieces to the *Post* and published in 1991 *How*

Did I Get Here So Fast? Rhetorical Questions and Available Answers from a Long and Happy Life.

From these interviews I extracted ten factors mentioned most often by my subjects as keys to successful aging. I then related these factors to what we know about the brain. To my great satisfaction I discovered that the factors mentioned by my subjects as promoting good mental and emotional health correlate with the factors now known to be important in the preservation of optimal brain functioning.

Here are the ten factors for healthy brain functioning: (1) education, (2) curiosity, (3) energy, (4) keeping busy, (5) regular exercise and physical activity, (6) acceptance of unavoidable limitations, (7) the need for diversity and novelty, (8) psychological continuity over the life span, (9) the maintenance of friends and social networks, and (10) the establishment and fostering of links with younger people. Here, in their own words, are the recommendations of these stellar exemplars of robust aging. In several instances I have supplemented their comments with reflections on how their recommendations enhance optimal brain functioning.

Education

CHALMERS ROBERTS

When you boil it down to the essentials, that means keeping your heart pumping, your noodle active, and your mood cheery. One theory is that the best way to stimulate your mind is to receive and absorb a constant supply of information.

Keep the gears moving, so to speak. Don't just read the morning newspaper. Get out of the house. Lunch with friends. Go see these movies the young describe as "awesome." Read something that challenges the conventional wisdom in whatever field holds your lifelong interest. Travel is tremendously stimulating, but you have to do your homework. I always try to do my essential reading before leaving home. This wisdom is carved into one of the massive panels at the top outside front of Washington's Union Station: "He that would bring home the wealth of the Indies must carry the wealth of the Indies with him. So it is in traveling—a man must carry knowledge with him if he would bring home knowledge."

CHARLES GUGGENHEIM

The more education you have in terms of knowledge and curiosity about the world, the more you are able to further your enrichment. Education enables you to extend your life into periods that preceded you. A familiarity with history, for instance, gives you an opportunity to live in any century you want and live the life in your imagination of anybody who has ever lived before. That's what education and history are all about. And that's why it's so sad to see older people retiring to a life of golf or mindless travel or incessant "busyness." There is an opportunity out there, a late-life chance to deepen and learn. That's why we can never stop learning or stop asking questions. I often tell people who neglect the opportunity for additional learning and education that they are living in a house with five rooms that they have yet to visit.

• At any given moment, any one of the 10 to 20 billion neurons in our brain is potentially capable of establishing

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connections with any other. Thanks to elaborate networks, no cell is more than three or four degrees of separation from another. What's more, the brain thrives on the number and richness of its connections. The take-home lesson from these facts seems obvious: learn more, learn something new, and the brain's network of interconnections is further elaborated.

It's incredible to me that although everyone would agree about the inadvisability of consigning a high-performance car to inactivity for long periods of time, few people realize the same principle holds for the highest-performance vehicle in the universe.

Education is an enriching and liberating process. Knowledge brings joy—a joy you can see on the face of a fourth-grader who has just successfully solved a math problem involving fractions, or on the face of an 80-year-old learning about the Crusades in an adult education course. The brain is designed to process knowledge and information just as the digestive system is designed to process food or the lungs process oxygen. If food, oxygen, or knowledge is cut off, the organism dies. It's that simple.

Curiosity

This is the mental trait mentioned most frequently.

ART BUCHWALD

To remain creative and mentally sharp, you have to come up with things nobody else has thought of, or you have to deal with familiar things in novel ways. But most important of all,

you have to have a sense of curiosity. For instance, just a few minutes ago while walking here on the Vineyard [Martha's Vineyard, where our discussion took place], I came upon a minor traffic accident. I stopped because I was curious about the people involved, and how the accident happened and why it happened. Other people walk by these kinds of situations and think only about such things as insurance, who was at fault, and who might have to pay. But that is no way to remain sharp and mentally vibrant. You have to stay curious about people and what they are doing. Who are the people in the cars? Where were they going? What is their response to this relatively minor mishap? I'm curious about such things. If interest and curiosity stop coming automatically to you, then you're in trouble, no matter how young you are. In fact, I believe interest and creativity prolong life and enhance life. I believe people who are interested in the people and events around them live better and feel younger.

- The importance of curiosity to retained optimal mental functioning should come as no surprise. Curiosity is an integrative and complex function related to motivation, arousal, attention, and preference for novelty. All of these depend upon the operation of the brain at its highest levels of performance. Moreover, curiosity can and must be cultivated at every age. Not only is it a marker for healthy brain aging, but it's likely that the deliberate cultivation of curiosity protects against brain degeneration. As we become more curious about the world, our interaction and involvement with others increases as well. This leads to even more information, and hence increased curiosity. The more we learn, the more we want to learn.



Energy

CHARLES GUGGENHEIM

One of the challenges in the later years is to generate the same amount of energy you did when you were younger. I discovered the secret of how to do that while working on my film about Harry Truman. Truman, as well as Lyndon Johnson, a subject of another documentary film of mine, took regular naps. Truman napped for a half hour after lunch. Johnson went even further and put on pajamas before retiring for his afternoon nap. When Johnson woke up he started another eight-hour work session. The nap enabled him to put in two eight-hour workdays in the same twenty-four-hour period. On my 71st birthday I decided that if Truman and Johnson took naps, maybe I should take a nap. This decision took some self-convincing, incidentally. Our culture frowns on naps as unproductive. How many people do you know that will tell you without a mild sense of embarrassment that they take naps? Nevertheless, I decided to try napping and see what happened. Now, after lunch, if I feel in a low-energy state, I take a short nap. Like Truman and Johnson, I wake up after twenty or at most thirty minutes feeling energized and refreshed. But interestingly, I don't have to take the nap. If I am deeply involved in something or if I have something on my mind I want to do, I have no need or desire to nap and I skip it for the day. What's more, I don't miss it at such times. A nap is a marvelous means for neutralizing that little falloff in energy that comes in the later years.

- The key point to remember: with the passage of the years, some diminishment in energy reserves is normal, even inevitable, due to loss of activating and alerting neurotransmitters from the subcortical nuclei (the "juice machines"). The first step toward overcoming this loss of energy is to realize that the problem does not involve a loss of skills or abilities but simply a diminishment in raw energy. While this loss of energy can be combated by stimulants, sometimes the best approach to replenishing one's energy reserves is a nap or quiet rest.

As Charles Guggenheim remarks, the nap is restorative and can easily be dispensed with at times when external events provide the impetus for renewed energy. This ties in with the curiosity principle: the more involved and enthusiastic you are about people and events, the more energized you will be.

Keeping Busy

OLGA HIRSHHORN

After my long second marriage and when I became a widow at 61, I knew I had to make a life of my own. Nobody was going to make it for me. I had to become a person unto myself, and to do that I had to work at it.

First, I determined to keep physically busy. Every morning I ride my bike. I play tennis regularly and some occasional golf. And it's never too late to take up something new. I began skiing at 60 and horseback riding at 65. I was nearly 70 when I took adult sailing lessons at the yacht club here in Vineyard Haven.

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For mental exercise I read a lot. I keep two books going, one in a bag I carry around with me during the day, and the other by my bed. I also keep a date book—I can tell you where I had dinner on this date thirty years ago. Three years ago I started bridge lessons to keep my mind keen. One or two evenings a week I get together with friends to play Pictionary, backgammon, dominoes, or bridge.

I also think it's important to remain open to new experiences and spontaneous proposals. For instance, a year or so ago a friend I knew from the art world suggested at a dinner party that I go with him on a trip to India. I went and experienced a part of the world I had only read about until then.

Overall, I've found that the more I do, the more I want to do. My activity keeps my brain working marvelously well. As an added bonus, I don't have time to brood about the past or get depressed.

DANIEL SCHORR

External stimulation is very important to me. And fascination with news events going on in the world provides me with my greatest stimulation. I guess you could say I am a news junky. I wake up in the morning and put an earplug in my ear (so as not to awaken my wife) and then listen to the news. After that, I get up and read four papers thoroughly. Two days a week I call in NPR and tell them what news story I will comment on that day. Writing the commentary provides the framework for my activities at least up until lunch. Following this, there are then any number of business calls and things to be done at home or at the office. Obviously, I don't like a lot of empty time. Over the years I've found out empty time isn't good for me. In 1965, for instance, I suffered from an

ulcer. Almost invariably I would get an ulcer attack when I went on vacation. This pattern is repeating itself now with an episode of shingles I've recently been bothered with. I experience no discomfort while writing a commentary, but as soon as I'm finished I begin to feel the pain again. This is like my ulcer all over again, I'm thinking. The more things I do that I enjoy doing, the better I feel. In fact, I'm only tired when I don't have anything to do. Instead of tiring me out, one activity generates excitement and energy for another.

Regular Exercise

CHALMERS ROBERTS

By our 80s most of us have to make some concessions to the state of our physical health. We do need exercise, and my regular exercise is swimming, skinny-dipping when we have the pool to ourselves. There's nothing better. One writer I know rhapsodizes, "One of the sport's main attractions is its Zen of quiet, meditative tranquillity—back and forth, back and forth—that lets the mind float off to peaceful levels of creativity and well-being."

Acceptance

HARRIET DOERR

In my old age I am afflicted with dreadful eyes. The doctor says I'm functionally blind now. Indeed, I am thankful I can see at all. My right eye has glaucoma and retinal problems.

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In my left eye I have no central vision but only peripheral vision. When the glaucoma doctor's examination confirmed the loss of my central vision, he said, "Don't belittle peripheral vision. That's how we see the tiger in the grass." Then he added, "It's also how the tiger sees us." I remembered that remark and used it as the title for my latest book.

Adjusting to my loss of vision has been hard, but I have enjoyed some secondary benefits. When you can't see, you think a lot more. The best exercise of my imagination is sometimes lying in bed a few moments in the morning in the silent house and letting things like a difficult sentence or the ending of a story simply float into the mind.

I've also learned to employ various methods of substitution for my visual handicap. Over the last seven years I have switched to a word processor. Mine has enlarged black-and-white keys, and I wear special glasses when I'm writing with it so that I can see from farther away.

While I can still see well enough to read with my special glasses, it takes a lot of concentration. But that's not a problem if I'm interested in something. When interested, I can concentrate no matter how long it takes me. Determination is what makes that possible. Determination has a lot to do with creativity. I just make myself do something I want to do, and if it's something interesting, I don't feel tired.

MORRIS WEST

My health isn't perfect. I've had cardiac surgery and must take pills to keep me from cardiac failure. But the pills work well and I can write with reasonable normality and continue the extensive travel schedule that I have always enjoyed. To accommodate to the changes brought on by the years, I've

adopted a rhythm for my life. I work a half day till one o'clock, when I have a light lunch, and then rest and swim in the afternoon. At five-thirty or so I have a drink. So far this schedule has worked pretty well for me. I am 80 years old, with most of my faculties still intact enough for me to continue a productive writing career. After finishing my twenty-seventh and latest novel, *Vanishing Point*, I started writing the fourth novel of my *Papacy* series. I have every hope that I will be spared sufficient time to complete it.

ART BUCHWALD

Sleeplessness is something I made peace with years ago. Because I have a form of sleep apnea, I wake up often about four in the morning. Instead of brooding or fretting about my insomnia, I get up and read the papers. Eventually I get tired again and go back to bed and asleep.

• Acceptance demands a balanced approach to life that not every older person achieves. On the one hand, there are the inevitable changes in physical and mental functioning that accompany getting older. One can rage and fret against such things as decreased eyesight or difficulty falling and remaining asleep. Or these undesired changes can be accepted and incorporated into new behavioral patterns. When awakened at night, Art Buchwald reads background material that can be used later as the basis for one of his columns. Morris West works with his heart condition by adopting a regular, physically healthy daily regimen that enables him to stay refreshed and creative. Such approaches not only make good practical sense but are in the best tradition of keeping the brain free from the twin demons of depression and suicide.

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Indeed, I'm convinced that failure to achieve a healthy acceptance of the life changes accompanying aging lies at the bottom of many later-life depressions and suicides. Simple denial doesn't work. One must recognize these later-life limitations in order to overcome them. Yet at the same time, the older person must be careful not to sink into fatalism and despair by too ready an acceptance of things. Perhaps the best summation of desirable acceptance as opposed to simply giving up and becoming too accepting is contained in the Serenity Prayer: "Lord, give me the strength to change the things I can change, the humility to accept the things that cannot be changed, and the wisdom to know the difference."

Diversity and Novelty

MORRIS WEST

To me variety is the most important factor in retaining good brain function in the later years. You have to work at maintaining as diverse a range of activities as you're capable of. In my own case, I have taken up painting and jokingly tell people I hope to become a second Rembrandt. This interest in painting dates back to some modest art instruction I had in my youth. Now I have returned to that early interest for cognate reasons: it keeps me mentally challenged and it enables me to experience the world differently.

I tell others of my age that if they wish to remain mentally sharp, they must develop real interests, not just hobbies. I'm talking here about things people can do and achieve. For some, that may mean joining an association that enables

them to perform a living function, whether that be teaching retarded children or growing roses. The scale of the activity doesn't matter. What's important is that the interest involve stimulation, things to do and achieve, a new focus of interest. The more such activities that people can address themselves to, the better.

IRVING KRISTOL

As you enter middle age, it's time to get started on what I call a serious hobby: something that you enjoy and that keeps you stimulated but yet is not something that you expect to make money from. In my own case I started playing around with the stock market. Over the past twenty years or so, the activity has proved interesting and informative. I've picked up some astonishing information from reading analysts' reports and discussing business and economic trends with asset managers. Nor is it necessary to wager a lot of money. Sometimes I just make the purchases and sales in my head and check in a month or so to see how I would have done. But, of course, that's not half as much fun as actually putting some money down to back up your hunch. If you like gambling but prefer something in which the odds are not weighted against you, then the market provides a nice combination of intellectual challenge and stimulation, some excitement, and even a chance to make a little money.

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Linkage and Continuity

CHARLES GUGGENHEIM

I don't think I will ever retire in the conventional sense, but if I did, I would revisit many of the places from my childhood. I made a start on that project three years ago when I took the same train and stopped at the same station in the small town in North Dakota where as a third-grader I had lived happily for a summer with the family of a teacher. The teacher, Ada Louise Carpenter, who lived in our house in Cincinnati, had persuaded my parents to let her take me home with her to North Dakota that summer in order to help improve my reading (I was dyslexic). During my visit three years ago, I just walked through it all again: the prairie dogs, grasshoppers, the long, hot, dry days. I could have spent days just looking at the profile of the landscape and having my senses renewed. It was an opportunity to relive. It was like reading a good book for the second time.

The past can do this for us if we retain an interest in it. This is why historic preservation is so important. Historical buildings represent an age and period of time and thus are capable of transporting us to another experience, which is enriching and informative and exciting. An historic building or landmark reminds us, even when nothing is happening at the moment, that something important once did happen. By retaining links with the past, we live again through the exercise of our imagination. That's why the destruction of a historic site is so tragic. The personal and collective linkages are destroyed and we are all diminished. Somebody has taken

something away from us we can never recover again. It's so important to retain our linkages with our personal and collective past. I'm convinced of the value of the past in retaining our mental vitality in the present.

HARRIET DOERR

It's wonderful to return later in life to things you loved as a child. For me that love involved reading and writing. I read all the time as a child. I remember in sixth or seventh grade I would come home to the living room after school, bring ginger ale and graham crackers, fold myself into a chair, and, undisturbed, read *Les Misérables* for hours among my crumbs. In terms of writing, I always liked composition days at school, when I could write about anything that interested me.

After going off to college, first at Smith and then later after transferring to Stanford, I married early and as a result had to wait forty-five years to obtain my degree from Stanford. I returned there at age 65, three years after my husband died. I went back because I was curious and interested in learning new things. I also did it because it seemed like fun.

At Stanford, I signed up for the writing course without any thought at the time that published books would ever come of it. I loved the writing class and the discovery, thanks to the encouragement of my writing professors, that maybe I could put together some beautiful sentences. I experienced an enormous feeling of happiness while writing.

Sometimes people ask me if I am sorry I didn't write earlier in life, but the time then just wasn't right. I know I could never have written amid the hurly-burly of married life, with children and all the other responsibilities. I need quiet time

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for things like simply sitting in a lawn chair and thinking. The subconscious is very important, and you can't force things. The subconscious is always there, like a faithful companion, but you have to treat it well. I don't try to force myself. I avoid set routines and never write by a clock or make myself sit for an hour waiting for a word or image to come. And I always stop at a place where I still have something to say.

At my age I still care very much about words, and if I come across something wonderfully expressed, that experience is a total show stopper. Good writing will always do that for me. It's wonderful to find good writing on a page written by anyone. If that writing is my own, I feel an enormous satisfaction.

It is never too late in life for anyone to begin writing who shares that enthusiasm for excellence and beauty and yearns just to write a sentence that he or she can be proud of.

Friends and Social Networks

ART BUCHWALD

I care very much about what other people think about me. I feel most myself when I have done something successful and other people agree that I have.

CHARLES GUGGENHEIM

Assume that for some reason you are confined to the town or city you are now in and are not permitted to go outside it. You are not allowed to experience anything outside of this

place, which will be your world for the rest of your life. Let's also assume in this mental exercise that all knowledge has been taken away from you of your relatives—your parents, grandparents, cousins. Obviously, not even a jail is that confining. Part of the sense of confinement in our imaginary situation would come from the fact that your life consists of more than yourself and your immediate surroundings. You have been enriched by your connections with lives other than your own and places different from your present location.

Maintaining Links with the Young

C. VANN WOODWARD

I am unhappy unless I am writing. One important component of that process is staying in contact with my students. In fact, several are coming with their families to visit me over the upcoming weekend. Our interactions are of mutual benefit. They seek my thoughts and suggestions about their work. But I gain too, since being in touch with them enables me to remain creatively in contact with the thoughts of younger people. I really believe I gain as much from my former students as they do from me. Thus I never feel competitive with them or exploited by them. Indeed, I think of my former students as family and friends.

At home I have what I call a "vanity shelf" of books published by my former students. Most of these books started out as published dissertations that I directed. Several of the books achieved great success, such as the Pulitzer Prize-winning

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Battle Cry of Freedom by James McPherson. I am happy for such successes and feel happy that I have had the opportunity to be a part of them. That, of course, would not have been possible had I not made deliberate efforts to remain in touch with younger people.

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On the subject of retirement, several of the interviewees underscored the need for never really retiring in the conventional sense.

CHARLES GUGGENHEIM

The important point is that if you choose to retire, you should retire *to* something, not *from* something. I did a film for AARP, and what impressed me the most about the people we interviewed prior to retirement was that few of them had planned ahead more than a few weeks. If asked about their plans, they would mention intentions to clean or refinish a basement—projects that would be over in weeks, at the outer limit—and then what would they do with their time? They hadn't a clue.

ART BUCHWALD

The mentally creative person never thinks of himself as retired. That's because if you keep doing something interesting as you get older, you're a more interesting person, not only to everybody else but yourself as well. One other benefit: if you can continue to keep doing something challenging as you get older, your natural tendency will be to think and feel you're not getting older.

MORRIS WEST

The problem with retirement stems from the absence in our society of the traditional family and tribal relations. The support systems that were the norm in previous societies are no longer present. Neither the parish nor the synagogue function any longer as effective means of bringing people together. This means the aging person is forced to accept so much more responsibility for his own well-being than was previously the case. This isn't necessarily all bad, of course, but it should make a person think carefully about removing himself from the social network he enjoys at work. Finding another "place" for himself, psychologically speaking, may turn out to be more difficult than he imagined.

DANIEL SCHORR

If there is any message I would give to someone considering retirement, it is this: retire to some other occupation or don't retire. Arrange your life in such a way that people call on you or need you for something. That way you remain vital and a part of things. In my own case, I feel tremendously lucky because I enjoy my work and have no immediate intention to retire. And I take all of the necessary steps to make sure there will always be things for me to do that I will enjoy and that will make me feel good.

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Appendix D

Creating Lifelong Learning Communities



A New Way of Thinking About Education

The Need for a New Way of Thinking

Perceptive observers of modern civilization have been exhorting for some time now that the nineteenth-century model of education, on which our contemporary educational enterprise is based (and seemingly frozen into) is no longer functional in a world of accelerating change. Witness:

Alfred North Whitehead pointed out in 1931 that it was appropriate to define education as a process of transmitting what is known only when the time-span of major cultural change was greater than the life-span of individuals. Under this condition, what people learn in their youth will remain valid and useful for the rest of their lives. But, *Whitehead* proposed, "We are living in the first period in human history for which this assumption is false . . . today this time-span is considerably shorter than that of human life, and accordingly our training must prepare individuals to face a novelty of conditions." Education must, therefore, now be defined as a lifelong process of continuing inquiry. And so the most important learning of all—for both children and adults—is learning how to learn, acquiring the skills of self-directed inquiry. [*Whitehead*, 1931, pp. viii-xix]

Donald A. Schon proposed in 1971 in his classic work, *Beyond the Stable State*, that most of our current social institutions, including those of gover-

* A working paper prepared for the UNESCO Institute for Education, January 1983, by Malcolm S. Knowles.

nance and education, emerged during the relatively stable state of the last century and therefore are geared to maintaining stability, but that we are now in an era of instability which requires a very different set of assumptions:

1. The loss of the stable state means that our society and all of its institutions are in *continuing* processes of transformation. We cannot expect new stable states that will endure even for our lifetimes.
2. We must learn to understand, guide, influence, and manage these transformations. We must make the capacity for understanding them integral to ourselves and our institutions.
3. We must, in other words, become adept at learning. We must become able not only to transform our institutions, in response to changing situations and requirements; we must invent and develop institutions that are "learning systems," that is to say, systems capable of bringing about their own continuing transformation.
4. The task which the loss of the stable state makes imperative, for the person, for our institutions, for our society as a whole, is to learn about learning. What is the nature of the process by which organizations, institutions, and societies transform themselves? What are the characteristics of effective learning systems? What are the forms and limits of knowledge that can operate within processes of social learning? What demands are made upon a person who engages in this kind of learning? [Schon, 1971, p. 30]

Edgar Faure and his associates on the International Commission on the Development of Education established by UNESCO, observed in 1972 that "for the first time in history, education is now engaged in preparing men for a type of society which does not yet exist." The Commission makes a number of recommendations for the reorganization of our global educational enterprise around the concept of lifelong learning. Its concluding recommendation is as follows:

The concept of education limited in time (to "school age") and confined in space (to school buildings) must be superseded. School education must be regarded not as an end but as the fundamental component of total educational activity, which includes both institutionalized and out-of-school education. A proportion of educational activity should be deformedalized and replaced by flexible, diversified models. Excessive prolongation of compulsory schooling, which is beyond certain countries' capacities, must be avoided. The extension of continual

training will more than compensate for the shorter average duration of initial studies. Briefly, education must be conceived of as an existential continuum as long as life. [Faure, 1972, p. 233]

Samuel Gould, chairman of the Commission on Nontraditional Study, describes the difficulty the Commission experienced in defining this concept in 1973:

Despite our lack of a completely suitable definition, we always seemed to sense the areas of education around which our interests centered. This community of concern was a mysterious light in the darkness, yet not at all mysterious in retrospect. Most of us agreed that nontraditional study is more an attitude than a system and thus can never be defined except tangentially. This attitude puts the student first and the institution second, concentrates more on the former's need than the latter's convenience, encourages diversity of individual opportunity rather than uniform prescription, and deemphasizes time, space, and even course requirements in favor of competence and, where applicable, performance. It has concern for the learner of any age and circumstance, for the degree aspirant as well as the person who finds sufficient reward in enriching life through constant, periodic, or occasional study. [Gould, 1973, p. xv]

Botkin, Elmandjra, and Malitza, in the classic report to the Club of Rome, *No Limits to Learning* in 1979, call for a new dimension of learning:

Serious doubt must be raised as to whether conventional human learning processes are still adequate today. Traditionally, societies and individuals have adopted a pattern of continuous *maintenance learning* interrupted by short periods of innovation stimulated largely by the shock of external events. Maintenance learning is the acquisition of fixed outlooks, methods, and rules for dealing with known and recurring situations. It enhances our problem-solving ability for problems that are given. It is the type of learning designed to maintain an existing system or an established way of life. Maintenance learning is, and will continue to be, indispensable to the functioning and stability of every society.

But for long-term survival, particularly in times of turbulence, change, or discontinuity, another type of learning is even more essential. It is the type of learning that can bring change, renewal, restructuring, and problem reformulation—and which we shall call *innovative learning*. [Botkin, 1979, pp. 9-10]

This list of responsible social analysts who join in the chorus calling for a new way of thinking about education could be added to the score, with such names as Adichiah, Cropley, Dave, Dumazedier, Husen, Jessup, Leningrad, Mahu, Michael, Morphet, Sarason, Shimbori, and Toffler among

(2)

them. The keynote of this chorus may well have been struck by one of the leading educational historians of our time, Lawrence A. Cremin of Columbia University, when he said at the Fall Conference of the Educators in Non-School Settings in 1981, "We may be living through a revolution in education which may be as fundamental as the original invention of the schools."

The Promise of Systems Theory

Systems theory provides us with the tools for this new way of thinking about education. Ludwig von Bertalanffy (1968), one of the pioneers in the development of systems theory, describes the concept as follows: "... systems theory is a broad view which far transcends technological problems and demands, a reorientation that has become necessary in science in general and in a gamut of disciplines from physics and biology to the behavioral and social sciences and to philosophy. (p. vii) . . . In one way or another, we are forced to deal with complexities, with 'wholes' or 'systems,' in all fields of knowledge. This implies a basic re-orientation in scientific thinking." (p. 5)

Hayman (1975) comments that . . . "this is not a theory in the usual scientific sense of a discrete system of assumptions, constructs, and functional relationships which explains and predicts the behavior of some particular phenomena. Systems theory is rather a set of principles, an orientation in thinking, a general body of knowledge applicable in a wide variety of circumstances. It applies in circumstances where 'wholeness' is important, and this is usually the case when dealing with the problems of education." (p. 3)

Capra (1982) makes an even broader and more contemporary case for the application of systems theory to our global situation:

We find ourselves today in a state of profound, worldwide crisis. We can read about the various aspects of this crisis every day in the newspapers. We have an energy crisis, high inflation and unemployment, pollution and other environmental disasters, the ever-increasing threat of nuclear war, a rising wave of violence and crime, and so on.

All of these threats are actually different facets of one and the same crisis—essentially a crisis of perception. We are trying to apply the concepts of an outdated world view—the mechanistic world view of Cartesian-Newtonian science—to a reality that can no longer be understood in these terms.

We live in a globally interconnected world, in which biological, psychological, social, and environmental phenomena are all interdependent. To describe this world appropriately we need an ecological perspective that the Cartesian world view cannot offer.

What we need, then, is a fundamental change in our thoughts, perceptions, and values. The beginnings of this change are already visible in all fields, and the shift from a mechanistic to a holistic conception of reality is likely to dominate the entire decade. The gravity and global extent of our crisis indicate that the current changes are likely to result in a transformation of unprecedented dimensions, a turning point for our planet as a whole. (p. 19)

Further support of the application of systems theory is given by W. G. Walker in a previous publication of the UNESCO Institute for Education (1980): "Systems theory provides a promising foundation for approaching the question of the administration of lifelong education. The extraordinarily rich and diverse institutional resources which demand co-ordinating and communicating links for their optimum utilization can be seen clearly in their interacting reality through the eyes of this theory. Although it originated in the area of engineering (Griffiths, 1964), its significance in demonstrating relationships among institutions (systems and subsystems) and directions of change is too valuable to ignore. A system is a complex of elements in mutual interaction." (p. 145)

The central thesis of this paper is that any social system (family, neighborhood, organization, agency, community, state, nation, world) can be conceptualized as a system of learning resources, and that when it is so conceptualized, one perceives the organization and delivery of educational services in a different way from the traditional view of education as a mosaic of educational programs conducted by a plethora of largely unconnected institutions. It calls for a new institutional form for education—a lifelong learning resource system or "Learning Community." I shall try to sketch out in broad strokes how I visualize how such a system can be organized and how it will operate in a community in North America.

Assumptions on Which This Model Is Based

This model of a Lifelong Learning Resources System is based on the following assumptions:

1. Learning in a world of accelerating change must be a lifelong process.
2. Learning is a process of active inquiry with the initiative residing in the learner.
3. The purpose of education is to facilitate the development of the competencies required for performance in life situations.

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4. Learners are highly diverse in their experiential backgrounds, pace of learning, readiness to learn, and styles of learning; therefore, learning programs need to be highly individualized.
5. Resources for learning abound in every environment; a primary task of a learning system is to identify these resources and link learners with them effectively.
6. People who have been taught in traditional schools have on the whole been conditioned to perceive the proper role of learners as being dependent on teachers to make decisions for them as to what should be learned, how it should be learned, when it should be learned, and if it has been learned; they therefore need to be helped to make the transition to becoming self-directed learners.
7. Learning (even self-directed learning) is enhanced by interaction with other learners.
8. Learning is more efficient if guided by a process structure (e.g., learning plan) than by a content structure (e.g., course outline).

Steps in Creating a Lifelong Learning Resource System

1. Identifying all the learning resources in a community. By using community survey techniques (see Knowles, 1980, pp. 106-118), information can be assembled regarding the wide variety of learning resources available in every community, including the following:
 - a. Institutions: educational, religious, health and social service agencies, governmental agencies, libraries, etc.
 - b. Voluntary organizations: labor unions, consumer and producer cooperatives, civic and fraternal societies, agricultural organizations, youth organizations, political organizations, professional societies, etc.
 - c. Economic enterprises: business and industrial firms, farms, markets, trades, etc.
 - d. The media.
 - e. Episodic events: fairs, celebrations, exhibits, trips, rituals, etc.
 - f. Environmental resources: parks, reserves, zoos, forests, deserts, streams, etc.
 - g. People: workers, elders, specialists, families, neighbors, etc.
 - h. The inner resources of the individual learner: curiosities, aspirations, past and present experiences, etc.
2. Incorporating information about these resources into a data bank. What is called for here is a new institutional form that is spreading rapidly in North America and is being called an "educational bro-

3. Establishing a mechanism for policy making and administration. A cardinal principle in systems theory is that all parties that have a stake in a system should be represented in its management. In the case of our Lifelong Learning Resources System, this would include representatives of the participating institutions, organizations, economic enterprises, media, and various categories of learners. The kind of "flat" administration and "ad hoc" proposed by Cropley (1980) and his associates would seem to be most appropriate for a system such as this.
4. Designing a lifelong learning process. As Capra (1982, p. 23) puts it, "Systems thinking is process thinking; form becomes associated with process, interrelation with interaction, and opposites are unified through oscillation . . . The systems view is an ecological view. Like the view of modern physics, it emphasizes the interrelatedness and interdependence of all phenomena and the dynamic nature of living systems. All structure is seen as a manifestation of underlying processes, and living systems are described in terms of patterns of organization." My vision of a *process design* for a Lifelong Learning Resource System is described here.

Process Design for a Lifelong Learning Resource System

This model proposes that the process of lifelong learning consists of individuals engaging in a series (or, perhaps even better, spirals) of learning projects involving these elements: (1) a broadening and deepening of the skills of self-directed inquiry; (2) the diagnosis of learning needs (or, perhaps even better, competency-development needs); (3) translation of these needs into learning objectives; (4) identification of human and material resources, including guided experiences, for accomplishing the objectives; (5) designing of a plan of strategies for using these resources; (6) executing the plan; and (7) evaluating the extent to which the objectives have been accomplished. Let me follow an individual learner through this process:

1. The individual enters one of the centers of the system (and I visualize that there would be a main center with satellite centers within walking distance of every citizen) and is referred to a learning skill assessment

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laboratory. Here an assessment would be made of the individual's current level of skill in planning and carrying out a self-directed learning project (see Exhibit D-1). Skill-development exercises would be provided to help the individual move to a higher level of ability in self-directed learning.

2. The individual would then be referred to an educational diagnostician. This person would have access to a set of models of the competencies for performing the various life roles (see Exhibit D-2).

Exhibit D-1
The Skills of Self-Directed Learning

On the assumption that the primary purpose of schooling is to help individuals develop the skills of learning, the ultimate behavioral objective of schooling is: "The individual engages efficiently in collaborative self-directed inquiry in self-actualizing directions." I believe that these skills of learning include at least the following:

1. The ability to develop and be in touch with curiosities. Perhaps another way to describe this skill would be "the ability to engage in divergent thinking."
 2. The ability to perceive one's self objectively and accept feedback about one's performance nondefensively.
 3. The ability to diagnose one's learning needs in the light of models of competencies required for performing life roles.
 4. The ability to formulate learning objectives in terms that describe performance outcomes.
 5. The ability to identify human, material, and experiential resources for accomplishing various kinds of learning objectives.
 6. The ability to design a plan of strategies for making use of appropriate learning resources effectively.
 7. The ability to carry out a learning plan systematically and sequentially. This skill is the beginning of the ability to engage in convergent thinking.
 8. The ability to collect evidence of the accomplishment of learning objectives and have it validated through performance.
-

The diagnostician and learner would determine which life role, at what level of performance, is appropriate for the learner's next stage of development. The diagnostician would then engage with the learner in a set of performance assessments to determine what knowledge, understandings, skills, attitudes, and values the learner needs to acquire in order to achieve the level of performance specified by the competency model. Much of this process can be accomplished through group activity in conjunction with self-administered assessment modules. Each learner would leave the diagnostician with a profile of diagnosed learning needs.

3. The individual would next be referred to an educational planning consultant. This person would have immediate access to the data bank of learning resources and would work with the individual learner (again, often in groups) in designing a learning plan (currently often called a "learning contract") that would specify: (a) the learning objectives translated from the diagnosed needs; (b) the resources which the learner would utilize in accomplishing each objective; (c) perhaps a time frame for completing each objective; (d) specification of the evidence to be collected to indicate the extent to which each objective has been accomplished; and (e) specification of the means by which the evidence will be validated (preferably through some form of performance assessment rather than information recall).
4. The learner would then go to the resources, wherever they are in the community, alone or with groups, and carry out the learning plan.
5. Upon completion of the learning plan the individual would return to a center of the system for a rediagnosis of learning needs and the development of a next level of learning plan. This is what is meant by "spirals" of learning projects. A three-year-old might start with the simplest competencies of performing the role of "friend," as described in Exhibit D-2 and then move to one of the competencies of the role of "citizen" and then to one of the competencies of the role of "learner." These roles might well be the focus for the next several years, with increasingly complex competencies for each role—particularly those of the role of "learner"—being undertaken. In early adolescence the emphasis would gradually shift to the roles of "unique self," "citizen," and "worker." In the young adult years the emphasis would be on the roles of "worker," "citizen," "family member," and "leisure-time user." In middle-adult years "worker," "family member," and "leisure-time user" might get most attention; and in later years, "leisure-time user."

Notice that there are no "teachers" in this system. There are educational diagnosticians, educational planning consultants, and resource

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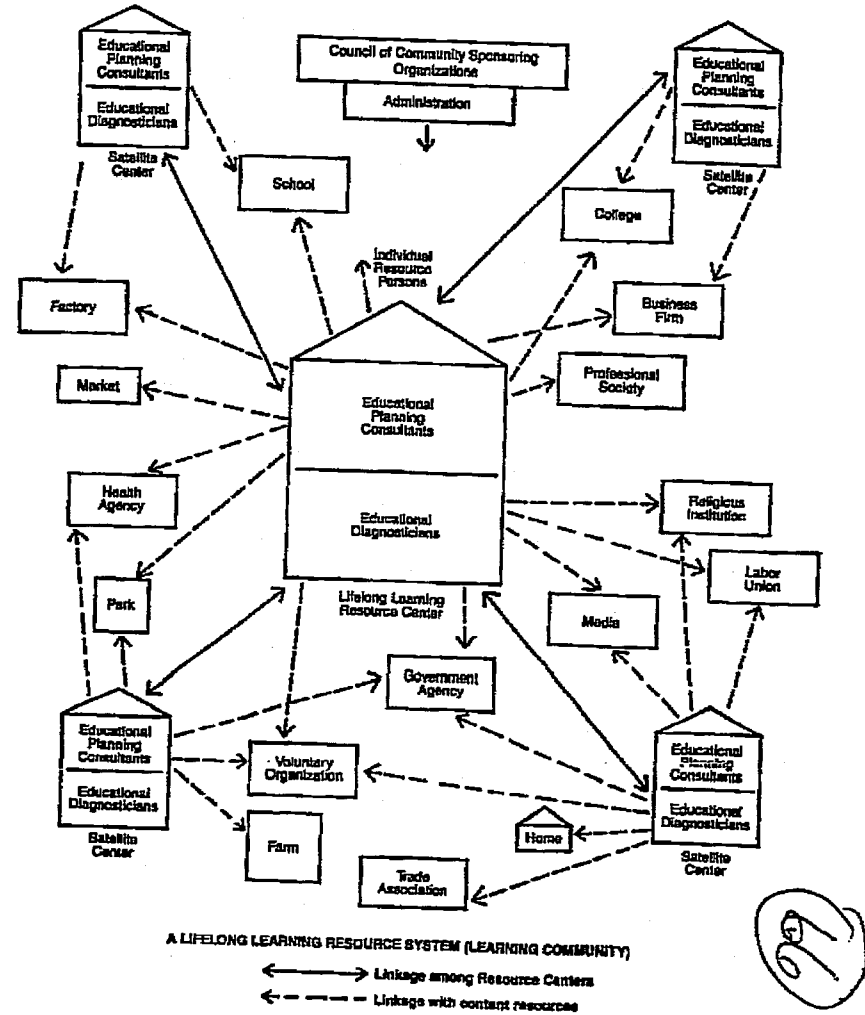
Exhibit D-2
Competencies for Performing Life Roles

Roles	Competencies
Learner	Reading, writing, computing, perceiving, conceptualizing, imagining, inquiring, aspiring, diagnosing, planning, getting help, evaluating
Being a self (with unique self-identity)	Self-analyzing, sensing, goal-building, objectivizing, value-clarifying, expressing, accepting, being authentic
Friend	Loving, empathizing, listening, collaborating, sharing, helping, giving constructive feedback, supporting
Citizen	Caring, participating, leading, decision-making, acting, "conscientizing," discussing, having perspective (historical and cultural), global citizen
Family member	Maintaining health, planning, managing, helping, sharing, buying, saving, loving, taking responsibility
Worker	Career planning, using technical skills, accepting supervision, giving supervision, getting along with people cooperating, planning, delegating, managing
Leisure-time user	Knowing resources, appreciating the arts and humanities, performing, playing, relaxing, reflecting, planning, risking.

people (and, of course, administrators or coordinators). These are roles that require a very different set of skills, attitudes, and values from those of the traditional classroom teachers, and so a process of retraining of teachers would be required to put the system into operation. The resource people would function most like teachers, in that they would be the content specialists. But they would be working with proactive rather than reactive learners, and so their content resources would be used differently from those of traditional teachers.

An attempt is made in Exhibit D-3 to portray this model of a Lifelong Learning Resource System graphically.

Exhibit D-3
A Lifelong Learning Resource System (Learning Community)



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Life Tasks of American Adults

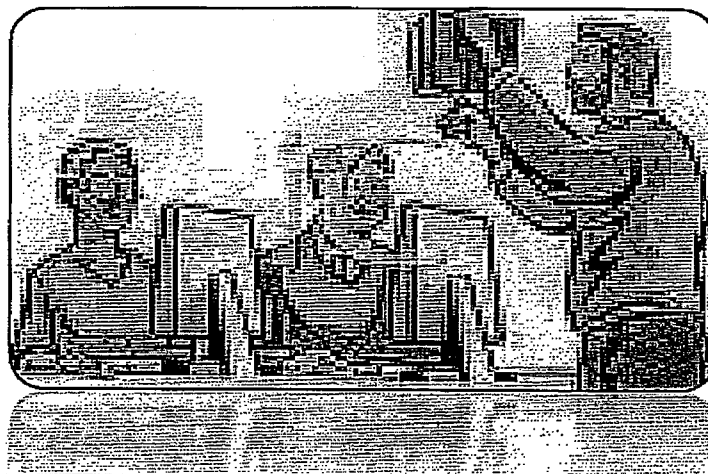
Modern Practice of Adult Education: From Pedagogy to Andragogy

(Knowles, 1980, p. 263-264)

	Enjoyment of Leisure Time	Health	Community Living
Older Adulthood (65 and over)	Establishing Affiliations with the older age group Finding new hobbies Learning new recreational skills Planning a balanced recreational program	Adjusting to decreasing strength and health Keeping fit Changing your diet Having regular medical exams Getting appropriate exercise Using drugs and medicines wisely Learning to deal with stress Maintaining your reserves	Working for improved conditions for the elderly Volunteering your service Maintaining organizational ties
	Vocation and Career	Home and Family Living	Personal Development
Older Adulthood (65 and over)	Adjusting to retirement Finding new ways to be useful Understanding social security, medicare, and welfare	Adjusting to reduced income Establishing new living arrangements Adjusting to death of spouse Learning to live alone Relating to grandchildren Establishing new intimate relationships Putting your estate in order	Developing compensatory abilities Understanding the aging process Re-examining your values Keeping future-oriented Keeping up your morale Keeping up to date Keeping in touch with young people Keeping curious Keeping up personal appearance Keeping an open mind Finding a new self-identity Developing a new time perspective Preparing for death

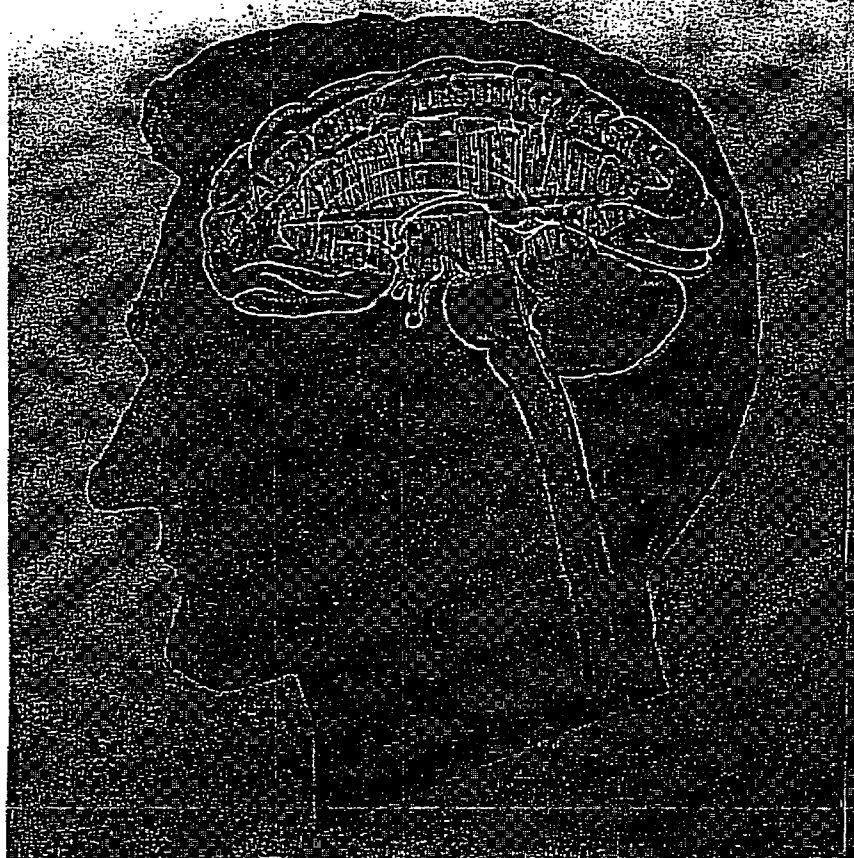
As you are readying yourself to teach older adults, what would / do you focus on regarding:

- **5. Implementing the Prepared Plan of Teaching Older Adults**



No One Is Too Old To Learn

Neuroandragogy: A Theoretical Perspective on Adult Brain Functions and Adult Learning



Clive A. Wilson

Foreword by John A. Henschke

PLASTICITY TESTING AGING
LEARNING EDUCATION
INTELLIGENCE RECALL

EDUCATION

NEUROANDRAGOGY tells of new advances in brain research. Much of this new research confirms what teachers of adults have been saying for years. A very good example of this is that children and adults do not learn in the same way. The brain of the child does not reach new brain function and true maturity until age 21 and older. This is clearly seen when youths use their emotions to decide and not their executive brains as adults do.

NEUROANDRAGOGY includes research that confirms ways adults can improve their IQ and sharpen their minds even into old age. This is possible because "brain plasticity" still occurs late in life. Even more interesting is the fact that we may even be able to experience neurogenesis (new brain cell growth) through life if we continue to learn new things and live within a brain stimulating environment.

NEUROANDRAGOGY also makes the case for a possible delay of Alzheimer's disease by the activity of new learning (music, a new language, a new town, etc.) All this contributes to good brain health which improves on life itself.

Clive has an earned Doctorate in adult studies from Oral Roberts University. He specializes in andragogy (the science of adult education and learning), and has over 30 years of experience working with adults. Clive is the founder of an adult training institute. He and his wife have made NY home.

ISBN: 0-595-38766-7



9 780595 387663

5 1695



\$16.95 U.S.

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NO ONE IS TOO OLD TO LEARN

Neuroandragogy: A Theoretical Perspective on Adult Brain Functions and Adult Learning

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ISBN-13: 978-0-595-38766-3 (pbk)
ISBN-13: 978-0-595-83148-7 (ebk)
ISBN-10: 0-595-38766-7 (pbk)
ISBN-10: 0-595-83148-6 (ebk)

Printed in the United States of America

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FOREWORD

The term "Andragogy" was coined and first appeared in published form in 1833 by German School Teacher, Alexander Kapp in his book entitled *Platon's Erziehungslehre* (Plato's Educational Ideas) (See Appendix). He intended andragogy to be the education adults experienced which included and combined the education of inner, subjective personality ("character") and outer, objective competencies. Kapp also promoted andragogy as learning that takes place beyond self-reflection and life experience and, that it is more than just teaching adults (photo-copies of early German works can be found in the appendix).

Since Kapp's time andragogy as a term, as a theory, as a subject and as a science has been studied widely and has gained international recognition, developing deep roots in spite of repeated philosophical and ideological transformation. Historically speaking, when adult education became a field of theorizing in Germany in the 1920's, the term andragogy was not in use and had not been for more than 85 years. A reintroduction of the term brought a change to the direction of educational theory and practice. Andragogy then became the description of sets of explicit reflections, related to the why, what for, and how of teaching adults. With the passing years, andragogy was declared in different ways, such as the true method by which adults keep themselves intelligent about the modern world, and representing the learning process in which theory and practice become one.

With new insights in adult learning habits, scientific research, as well as modern approaches to theory and practice, a new foundation for Andragogy began to emerge. By the 1980's andragogy began to take on a professional appearance and soon became recognized by some researchers as a fairly independent scientific discipline, and was established as a subject of study. Through the years andragogy's growth has resulted from changes and also additions of empirical research to its scientific foundation.

Clive Wilson's original edition of *No One Is Too Old To Learn: Neuroandragogy: A Theoretical Perspective On Adult Brain Functions And Adult Learning*, represents such an addition, and is a landmark in the presentation of a scientific foundation for research in adult learning and its roots in and relationship to the adult human brain. This is the only book I know that delivers such in-depth

information and research about the scientific foundation of how adults learn. In this book, Clive has focused purposefully on the adult brain, its cognitive functions, its graduation, and its relationship to the education and learning process of the adult. This book is an important contribution to our literature as well as a valuable resource for those individuals who wish to contribute to andragogy as a scientific discipline of study.

John A. Henschke
St. Louis, Missouri

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Healthy older adults and IQ.

Although there remains numerous debates on the nature of IQ, its origin and development, Restak is very positive regarding the healthy, older adult and his IQ. Restak does not argue like Horn or Catell for measuring intelligence in old age by fluid measurements or crystallized measurements. He simply states that among other things such as language skills, vocabulary, abstract thinking, verbal expression, IQ remains the same. For Restak the older adult even gets better with age, and as a result, is given the responsibility to make the tough executive decisions. Restak's reasoning is that with age comes experience, with experience comes accumulated wisdom, with wisdom one may know how best to proceed in tough situations (Restak, 2001).

Restak (2000) states that the real challenge for older adults intellectually is how to keep the aging brain maintaining healthy circuits and healthy synapses, especially the hippocampus and the nearby entorhinal cortex. This is because both areas are needed for the formation of new memories and recalling of old ones.

For intelligence to remain, the aging brain must also remain, plastic and stable. For this to happen, John Morrison (as cited in Restak, 2001) claims the aging healthy brain must keep neurons alive and make every effort to keep them communicating. It is also important that the synapses remain plastic causing new learning, which must be stable so that these new things learned will remain and not be forgotten. Morrison mentions the genes playing a roll in the securing of IQ into old age, but admits that not enough is known about it.

However, says Restak (2001), for the time being we must work with what we understand. So far, the most promising tools of maintaining IQ into old age is the synapse and the neurochemicals that influence it. Restak stresses the point made by Morrison that the synapse seems to be the site of aging and not the loss of neurons as once believed. Morrison points out that contrary to popular opinion aging isn't accompanied by a large loss of neurons. This being the case, the aging synapse is becoming a major focus for neurobiologists who have an interest in the neurological cause of mental decline. It is within the power of the older adult to maintain their intellectual powers by using what they have and stimulating the synapses by newness and novelties which cause the growth of new connections.

8. Why Age-Related Physical Changes Do Not Dictate Decrease in Brain Plasticity

Neuroandragogy upholds research that the brain plasticity of the aging adult is not necessarily affected as long as the adult keeps using the brain correctly. Rybash, Roodin & Santrock (1991) found that despite biological age related changes, there was still a great deal of brain plasticity in adult intelligence. Restak (2001) believes loss of plasticity is a result of expectation and misuse of the brain. However, if the "use it or lose it" model is taken seriously by the aging adult, plasticity remains possible.

9. Testing and the Adult Brain

Researchers in adult education have concluded that intelligence tests, with emphasis on cognitive skills and formal logic, are no longer considered appropriate for all adult life situations (Tennant & Pogson, 1995). Also, adults have been found to perform poorly on timed tests. Gregory (ed., 1998) believes the adult's brain becomes hidebound or inflexible if placed under pressure to respond to any learning situation. Neuroandragogy emphasizes that adult students are more likely to experience timed test anxiety than their youth counterparts. However, they will do just as well if not timed or placed under pressure.

Teachers of adults, policy makers, administrators etc. must begin to seek new ways to evaluate adult students outside of timed testing. Adults should not be measured in this way, but must be judged on their own merits, their own capabilities, and in their own timing. Open book test, take home exams, timeless class room test, projects, papers etc. are effective ways used to evaluate adults.

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10. The Adult Educator

Adult educators should 1) teach with as much novelty as possible, for example: teach by way of controversy and in conflict to standard beliefs held by adult students; 2) Employ activities or teaching practices that involve all five senses to heighten memory and recall possibilities (Marieb, 1999; Hansome, 1931, Solomon, Breg & Martin, 1999).

- a. Adult educators must depart from decrementalistic views of inevitable decline often found in studies of psychology and give their students hope by promoting a continued potential view that acknowledges compensation for loss (Lemme, 1999).
- b. Adult educators must reevaluate old theories regarding adults, their education and learning. They must begin to show interest in understanding current research regarding adults, including brain sciences, as this will contribute to improved professional practice (Bruer, 1999; Sousa, 1998).
- c. Adult educators must involve students in designing curriculums that encourage complexity, novelty and creativity according to the interest of the adult student, and the scope of their experience and expertise (Knowles, 1990; Tennant & Pogson, 1995). However, each educator must bear in mind that what's complex to one student is not to the other. Thus variety is important.
- d. Adult educators must teach students to learn how to memorize, how to store information and how to recall it upon demand (Bruer, 1999; Fisher & Rose, 1998).
- e. Adult educators must lead students through the process of unlearning; this helps to eliminate old ideas making room for new ones, especially new information regarding their neural development and learning abilities (Bruer, 1999; Rosenstock in Hansome, 1931).

11. Adult Education

- a. Adult education must help students unlearn old ideas and myths about the brain. There must be more effort made to teach how the brain learns and the many benefits of new learning. (Bruer, 1999; Rosenstock in Hansome, 1931).

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- b. Adult education should not be approached or presented as a means to an end (job promotion, degree, etc.), but must be presented as an instrument of improvement for ones-self and the community at large. It must also be presented as an instrument capable of improving brain health.
- c. Adult education must in itself be promoted as a health tool. It is time to recognize education as a discipline that contributes to the well being of the individual. The brain must be recognized as being a critical part of the body and education must be used to maximize its capacity and sustain its health (Nussbaum, 2003).
- d. Adult education must encourage a proactive lifestyle among adults involving novelty, creativity and complexity. Adult education must encourage adult students to seek a life style that will improve their chance for longer life, better brain health and memory improvement. Exercise and nutrition programs should become a part of all adult education programs.
- e. Adult education should always make available new research regarding the brain and learning, to improve an awareness of the neurosciences.
- f. Adult education must be highlighted as a preventable measure against some neurodegenerative disorders.
- g. Adult education must create enriched learning environments to include: mental stimulation, socialization, and physical activity.

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ADULT LEARNING | NEUROSCIENCE

How to Train the Aging Brain

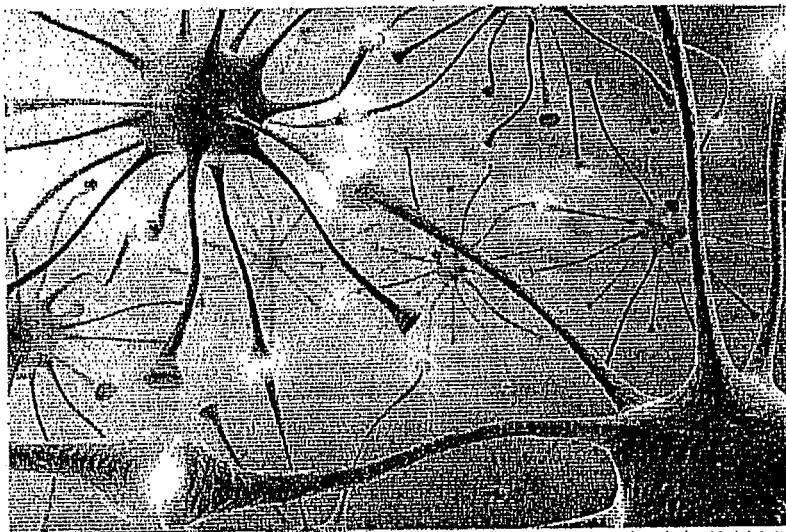


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GRAY MATTER Neurons make new connections during learning.

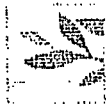
By BARBARA STRALICH
Published: December 29, 2009

I LOVE reading history, and the shelves in my living room are lined with fat, fact-filled books. There's "The Heminges of Monticello," about the family of Thomas Jefferson's slave mistress; there's "House of Cards," about the fall of Bear Stearns; there's "Titan," about John D. Rockefeller Sr.

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The problem is, as much as I've enjoyed these books, I don't really remember reading any of them. Certainly I know the main points. But didn't I, after underlining all those interesting parts, retain anything else? It's maddening and, sorry to say, not all that unusual for a brain at middle age: I don't just forget whole books, but movies I just saw, breakfasts I just ate, and the names, oh, the names are awful. Who are you?

CAREY MULLIGAN

Brains in middle age, which, with increased life spans, now stretches from the 40s to late 60s, also get more easily distracted. Start boiling water for pasta, go answer the doorbell and — whoosh — all thoughts of boiling water

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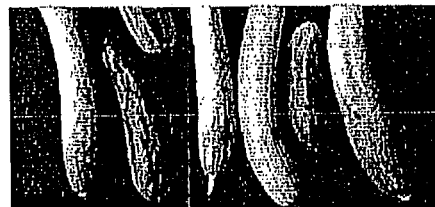
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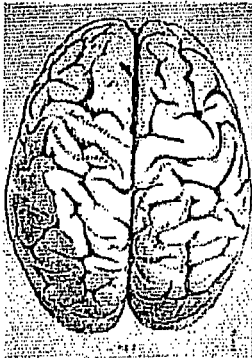


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A really old brain — from a 19th-century textbook.

disappear. Indeed, aging brains, even in the middle years, fall into what's called the default mode, during which the mind wanders off and begin daydreaming.

Given all this, the question arises, can an old brain learn, and then remember what it learns? Put another way, is this a brain that should be in school?

As it happens, yes. While it's tempting to focus on the flaws in older brains, that inducement overlooks how capable they've become. Over the past several years, scientists have looked deeper into how brains age and confirmed that they continue to develop through and beyond middle age.

Many longheld views, including the one that 40 percent of brain cells are lost, have been overturned. What is stuffed into your head may not have vanished but has simply been squirreled away in the folds of your neurons.

One explanation for how this occurs comes from Deborah M. Burke, a professor of psychology at Pomona College in California. Dr. Burke has done research on "tots," those tip-of-the-tongue times when you *know* something but can't quite call it to mind. Dr. Burke's research shows that such incidents increase in part because neural connections, which receive, process and transmit information, can weaken with disuse or age.

But she also finds that if you are primed with sounds that are close to those you're trying to remember — say someone talks about cherry pits as you try to recall Brad Pitt's name — suddenly the lost name will pop into mind. The similarity in sounds can jump-start a limp brain connection. (It also sometimes works to silently run through the alphabet until landing on the first letter of the wayward word.)

This association often happens automatically, and goes unnoticed. Not long ago I started reading "The Prize," a history of the oil business. When I got to the part about Rockefeller's early days as an oil refinery owner, I realized, hey, I already know this from having read "Titan." The material was still in my head; it just needed a little prodding to emerge.

Recently, researchers have found even more positive news. The brain, as it traverses middle age, gets better at recognizing the central idea, the big picture. If kept in good shape, the brain can continue to build pathways that help its owner recognize patterns and, as a consequence, see significance and even solutions much faster than a young person can.

The trick is finding ways to keep brain connections in good condition and to grow more of them.

"The brain is plastic and continues to change, not in getting bigger but allowing for greater complexity and deeper understanding," says Kathleen Taylor, a professor at St. Mary's College of California, who has studied ways to teach adults effectively. "As adults we may not always learn quite as fast, but we are set up for this next developmental step."

Educators say that, for adults, one way to nudge neurons in the right direction is to challenge the very assumptions they have worked so hard to accumulate while young. With a brain already full of well-connected pathways, adult learners should "jiggle their synapses a bit" by confronting thoughts that are contrary to their own, says Dr. Taylor, who is 66

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Teaching new facts should not be the focus of adult education, she says. Instead, continued brain development and a richer form of learning may require that you "bump up against people and ideas" that are different. In a history class, that might mean reading multiple viewpoints, and then prying open brain networks by reflecting on how what was learned has changed your view of the world.

"There's a place for information," Dr. Taylor says. "We need to know stuff. But we need to move beyond that and challenge our perception of the world. If you always hang around with those you agree with and read things that agree with what you already know, you're not going to wrestle with your established brain connections."

Such stretching is exactly what scientists say best keeps a brain in tune: get out of the comfort zone to push and nourish your brain. Do anything from learning a foreign language to taking a different route to work.

"As adults we have these well-trodden paths in our synapses," Dr. Taylor says. "We have to crack the cognitive egg and scramble it up. And if you learn something this way, when you think of it again you'll have an overlay of complexity you didn't have before -- and help your brain keep developing as well."

Jack Mezrow, a professor emeritus at Columbia Teachers College, has proposed that adults learn best if presented with what he calls a "disorienting dilemma," or something that "helps you critically reflect on the assumptions you've acquired."

Dr. Mezrow developed this concept 30 years ago after he studied women who had gone back to school. The women took this bold step only after having many conversations that helped them "challenge their own ingrained perceptions of that time when women could not do what men could do."

Such new discovery, Dr. Mezrow says, is the "essential thing in adult learning."

"As adults we have all those brain pathways built up, and we need to look at our insights critically," he says. "This is the best way for adults to learn. And if we do it, we can remain sharp."

And so I wonder, was my cognitive egg scrambled by reading that book on Thomas Jefferson? Did I, by exploring the flaws in a man I admire, create a suitably disorienting dilemma? Have I, as a result, shaken up and fed a brain cell or two?

And perhaps it doesn't matter that I can't, at times, recall the given name of the slave with whom Jefferson had all those children. After all, I can Google a simple name.

Sally.

Barbara Strauch is The Times's health editor; her book "The Secret Life of the Grown-Up Brain" will be published in April.

A version of this article appeared in print on January 3, 2010, on page ED10 of the New York edition

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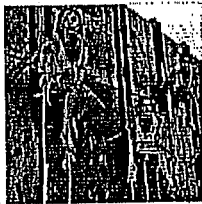
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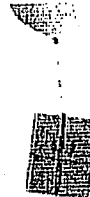
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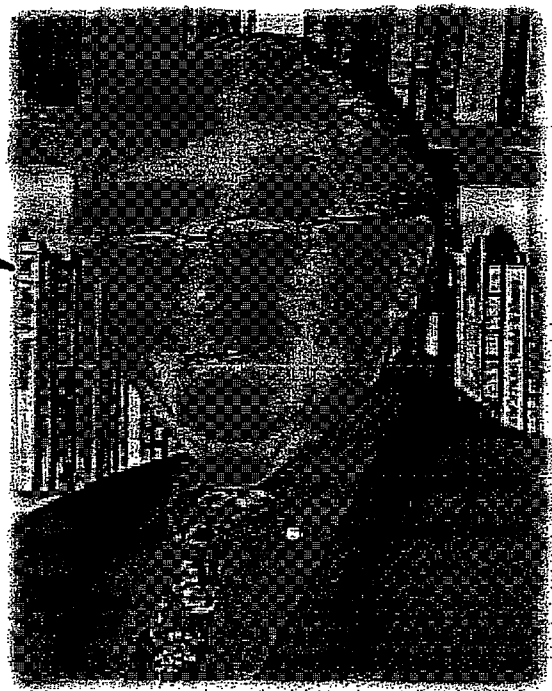
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