

Systematic Lesson Design for Adult Learners

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Abstract. It has often been the mistake of educators to treat instruction for adults like instruction for children. In recognizing adults as the unique learners they are, characteristics of adult learners are integrated with the lesson design level of the Gagne-Briggs model of instructional design to produce a design model which accommodates adult learning. The implications of learner characteristics such as experience, motivation, physiological barriers, psychological barriers, and memory are indicated for the components of the model, including objectives, instructional events, conditions of learning, media, and assessing learner performance. It is concluded that the Gagne-Briggs design model can be extended to a more holistic view of learning by attending to specific characteristics of adult learners.

Though much of the instruction developed by instructional designers is for adult learners, the fields of instructional design and adult education have quite different philosophical and theoretical emphases. The adult educator's approach to learning is frequently a combination of various philosophies of adult education with a primary emphasis on humanism. In humanistic adult education, the key ideas are related to "freedom and autonomy, trust, active cooperation and participation, and self-directed learning" (Elias & Merriam, 1980, p. 10). As presented here, instructional design is based on cognitive, particularly information-processing, and behavioral theories of learning. Given these different views of learning, approaches to instruction by adult educators and instructional designers differ significantly. Some adult educators do not believe the

use of systematic instructional design will create the most efficient learning outcomes for adult learners because the theories on which it is based represent a less than holistic view of learning (Apps, 1981).

The model for lesson design presented in this paper is basically that of Gagne and Briggs (1979) where a lesson is defined as "the smallest unit for which instruction is usually planned" (Briggs, 1977, p. xxii) and, as "the formal presentation of instructional stimuli to the learner" (Briggs and Wager, 1981, p. 137). The lesson level of instructional design consists of four stages:

1. Definition of Performance Objectives
2. Preparing Lesson Plans (or Modules)
3. Developing, Selecting Materials, Media
4. Assessing Student Performance (Gagne & Briggs, 1979, p. 23)

These stages do not exist independently of each other; hence it is somewhat difficult to discuss any one stage as distinct from the others. I have attempted to integrate characteristics of adult learners with each stage separately to make this information more readily applicable to the instructional designer who wishes to use it; however, some overlap remains.

The design model is intended for general application to a broad range of learners. Though determining learner characteristics is considered a component of the entire model (Andrews & Goodson, 1980), no procedures are presented to operationalize this component at the lesson design level. The designer takes responsibility for utilizing the design framework in view of the characteristics of the target group for which the instruction is being designed. The designer identifies the gross characteristics in the needs analysis; however, these are not the specific learner characteristics which may affect the design of lessons or materials.

Increased attention to the character-

istics of learners has been identified as a future trend in the implementation of instructional systems (See Dick, 1981). As an instructional designer, there is no particular reason to believe that designing instruction should be totally different for adults than for youth since the learning and memory structure is considered to be the same for both. However, designers continue to make the mistake of treating instruction for adults like instruction for youth with little or no consideration of the characteristics of adults which have an impact on the teaching/learning process. In view of the fact that adults do possess many characteristics specific to how they learn, I believe that the Gagne-Briggs design model can be extended to account for those characteristics so we can design more effective instruction for adults.

Various definitions of "adult learner" have been proposed in the literature (See Verner, 1964; Knowles, 1978; Cross, 1979; Apps, 1981). For the purpose of this paper, adult learners are broadly defined as persons who are 22 or older and who are participating in a purposeful, planned learning experience after being removed from such an experience for at least two years. Such a learner may be participating in a single experience or a program related to higher education, basic skills, or leisure time. Participation may be for personal or professional reasons, and the activity may be credited or non-credited.

The characteristics of adult learners are those which have been identified by numerous educators and researchers in adult learning. A selected few prominent sources will be cited. These characteristics which are addressed are related to factors such as memory, reaction time, motivation, learning strategies, psychological barriers, and experience, and have been the basis for adult learning principles.

This attempt to synthesize procedures for systematic lesson design and principles of adult learning might be viewed

as an attempt to integrate the humanistic with the cognitive and behavioral approaches to learning. Such a synthesis has not been evident in the literature. Each section presents some assumptions of the Gagne-Briggs design model and characteristics of adult learners relevant to aspects of the design model. Implications for instructional lesson design are noted with a bullet (•) throughout and summarized in the tables.

Defining Performance Objectives

Designers are well aware that lesson design begins with defining the objectives and they base subsequent lesson design decisions on the performance objectives which they have defined for the lesson. Needless to say, unless objectives are pre-set, a lesson cannot be systematically designed to achieve particular outcomes.

Briggs indicates that the role of the designer may be limited to this stage of lesson design when he states: "For adult learners such as graduate students, it may be necessary to agree upon the objectives; then the student teaches himself" (1977, p. 195).

The characteristics of adult learners which affect defining performance objectives include their motivation and their approach to the learning experience. Adults often have multiple motives or reasons for participating in learning experiences. In reporting the data from state studies, Cross (1979) presents a typology of motives along with the percentage of potential learners who reported such motives:

- (a) practical goals (increase in income, job promotion, new job)—about 50%
- (b) personal satisfaction or inner-directed personal goals—about 50%
- (c) to gain new knowledge (including learning for its own sake)—about 50% to about 75%
- (d) to achieve formal educational goals (degrees, certification)—about 8% to about 28%
- (e) to socialize—about 33%
- (f) to achieve societal goals—about 25%

Related to these motives is the adult's approach to learning. Knox (1977) states: "Most adults approach learning activities with expectations about what they will gain from the experience" (p. 425).

When defining performance objectives for adult learners:

- Explore the learners' expectations regarding what they expect to gain from

the learning experience (Knox, 1977).

- Keep objectives realistic so that they are not overwhelming yet they remain challenging (Knox, 1977).

- Remain open to compromising your expectations with those of the learners so that the learners will not be so dissatisfied that they don't wish to achieve the objectives (Knox, 1977).

- Sequence objectives so that as many as possible are independent of each other. You can then present the learner with options regarding the order in which objectives will be achieved. Such options provide the learners with more involvement with objectives than they would have with a highly sequenced set of objectives. Of course this strategy is only available when the nature of the learning outcome does not require hierarchical sequencing.

- If the learners are to be on their own once objectives are agreed upon, anticipate objectives which may be of interest to them, so that materials can be prepared to help them meet these objectives. Such materials may include self-instructional packages which either contain all the materials needed by the learner, part of the materials with referral of the learner to other sources, or total referral of the learner to other sources.

conditions of learning are a way of operationalizing the instructional events, they are also supportive of the internal processes of learning and memory.

What I think has been overlooked by instructional design due to its adherence to cognitive and behavioral theories is the potential for conditions of learning which support other aspects of learning—social, emotional, and physical aspects. For those designers using the lesson design component of the Gagne-Briggs model of instructional design, integrating the characteristics of adult learners with instructional events and conditions of learning can result in practical, useful information for designing lessons. By attempting the integration at a general level, I am proposing that learner characteristics in addition to, but not unrelated to, memory and learning processes are relevant bases for determining conditions of learning that promote effective, efficient learning.

The characteristics of adult learners support or indicate certain instructional events while at the same time indicating conditions of learning for those events. The section of this paper entitled "Instructional Events" presents those events as well as concomitant conditions of learning implied by certain characteristics of adult learners. The following

"It has often been the mistake of educators to treat instruction for adults like instruction for children."

Preparing Lesson Plans

At this stage of the lesson design process, the designer writes prescriptions for the instructional events in the lesson. Basing each prescription on the conditions of learning for the learning outcome stated in the objective, the designer describes the media and the teacher and learner activities which will operationalize the instructional events. Though the instructional events are the same for each type of learning outcome, the specific conditions of learning differ for the different kinds of learning identified by Gagne (Gagne & Briggs, 1979). Briggs suggests that in addition to being specific for each instructional event, certain conditions of learning may be diffused throughout a lesson. Since the

section, "Conditions of Learning," presents characteristics of adult learners which imply certain conditions of learning and then that indicates the instructional events to which these conditions may be applicable. This organization results from the notion that certain characteristics of adult learning have implications for events first and conditions of learning second; and other characteristics have implications for conditions of learning first and events second.

Instructional Events

The instructional events of the Gagne-Briggs (1979) model of instructional design are:

1. gaining attention

2. informing the learner of the objective
3. stimulating recall of prerequisites
4. presenting the stimulus material
5. providing learning guidance
6. eliciting performance
7. providing feedback
8. assessing performance
9. enhancing retention and transfer

Characteristics of adult learners which hold implications for the instructional events of a lesson include learner sophistication, motivation and expectations for participating in a learning experience, the value placed on incidental learning, experience, and learning strategies.

conditions of learning related to the event of choosing objectives include:

- Provide questions, prompts, organizers, or directions to guide attention when helping learners set realistic objectives (Knox, 1977).
- Help learners establish connections between known information and new information when helping learners define objectives (Knox, 1977).
- Provide examines in the form of a human role model, or a diagram or verbal description to help the learners clarify their expectations (Knox, 1977).

Adult learners place a high value on incidental learning. The gradual decline in incidental learning for older adults

structures may be based more on experience than on the structure of content (Knox, 1977).

- Provide activities to assess recall of related learning, so that the learners can find out what is familiar and unfamiliar to them.
- Branch learners to unfamiliar areas.
- Provide an option for review of familiar areas.
- Diagnose how topics and problems are viewed (Knox, 1977).

Providing (Pre-)Learning Guidance. Though this event ordinarily occurs after the stimulus material has been presented, some characteristics of adult learners call for attention to learning guidance prior to presenting the stimulus. Thus it may be re-named as pre-learning guidance. Learning strategies, cognitive structure, and related learning of adults receive attention here.

Adults tend to acquire more learning strategies with age; but, older adults tend to rely on those strategies already held rather than to acquire new ones (Knox, 1977).

- Help older adults modify their learning strategies or increase their repertoire of learning strategies. For example: the learner has some knowledge of a topic, begins reading materials from beginning to end at a steady pace and then goes to the next activity. The suggested alternative for the learner might be to skim the materials with particular attention to main ideas identifying that with which they are and are not familiar and giving most of their attention to the unfamiliar (Knox, 1977).

- Include an objective in the lesson which would address learning strategies. Intersperse instruction for such an objective with other lesson objectives.

- Present the learner with a variety of optional strategies regarding how to learn the material being presented.

Knox (1977) suggests that adult learners be assisted in building cognitive structure. Frankly, I don't have much to suggest, and Knox only suggests two generalities:

- Base attempts at building cognitive structure on the assessment of how topics and problems are viewed. (Knox, 1977).

- Present questions and basic ideas (Knox, 1977).

Knox reports that studies of adult problem-solving have indicated that problem-solving effectiveness requiring novel solutions declines with age. The accumulation of solutions over the years

"Social, emotional, and physical aspects of learning have been overlooked by instructional design."

Briggs (1977) states that the teacher or designer decides which events to supply for learners and which the learners may provide for themselves. He also suggests that adult learners can provide more events for themselves so that fewer events are provided by the teacher or class activities. Briggs is probably referring to learner sophistication which does not necessarily result from age. In addition, factors such as available time, ready access to resources, and self-directedness will affect whether or not adults provide themselves with the events needed to facilitate effective instruction. In planning for which events to include in the lesson, the designer should consider whether or not the learners are knowledgeable and skilled enough to organize and carry out their learning activities and whether or not they have the time and resources to do so.

Some characteristics of adult learners support the need for providing certain instructional events and others call for extending these events to account for the characteristics. I will illustrate this idea by examining most of the events.

Informing the learner of the objective. Instead of "informing the learner of the objective," the designer may think of this event as "choosing the objectives." Choices by the learner can contribute to interest, achievement, and application of the learning (Knox, 1977). Specific

may mean that older adults adapt by concentrating on relevant cues and ignoring irrelevant ones or, that the older adult loses previously acquired information related to the new learning; therefore, information which could have served to enhance understanding or establish connections is not available (Knox, 1977). In order not to stifle incidental learning by emphasis on performance objectives, provide conditions of learning which are diffused throughout the lesson:

- Keep each task as simple as possible, breaking complex tasks into a series of simple tasks when possible (Knox, 1977).

- Pace slowly (Knox, 1977).

- Emphasize relevant cues (Knox, 1977).

Stimulating recall of prerequisites. This event may be extended to "stimulating and assessing recall of related learning." Through previous learning and life experience, adults may have gained knowledge and skills which they can draw upon to facilitate learning new content. A further extension of this event is stimulating and assessing recall of cognitive structure. Older adults have had more time to develop detailed cognitive structures, and if these cognitive structures are inadequate they may interfere with effective learning (Knox, 1977). The adult's cognitive

forms a reservoir of solutions from which older adults tend to draw solutions rather than generate novel solutions.

- Help older adults compensate for deteriorations in problem-solving performance which result from interference from previous learning by assisting them in identifying prior ideas or practices that need to be unlearned and providing opportunities for such unlearning (Knox, 1977). Though unlearning is recognized as a sometimes necessary process, little if anything is known about how to assist learners with it.

Eliciting Performance, Providing Feedback, Assessing Performance. Knox (1977) reports that the adult's perception in attending to detailed and complex learning situations may be both useful and detrimental. The familiarity with information may enable the learner to use selective perception accurately or it may result in misunderstandings.

- Assess learning frequently to catch misunderstandings that may lead to cumulative failure (Wager, 1977).

- Relate feedback to progress toward goals. According to Kidd (1973), when the learning experience is voluntary, motivation for the adult learner is dependent on the adult being convinced that progress is being made toward his goals.

- Utilize peer review in providing feedback (Knox, 1977).

- Utilize comparisons with external standards in providing feedback (Knox, 1977).

Enhancing retention and transfer. If any event is likely to be left out of a lesson, it is that of enhancing retention and transfer. Since "adults usually engage in purposeful learning because they want to apply or transfer what they learn to a variety of conditions beyond the one in which the learning occurred" (Knox, 1977), this is a particularly important event for adult learners.

- Provide experiences in which learners can plan and rehearse the application of what was learned to daily life (Knowles, 1980).

Table 1 summarizes the instructional events and some specific and diffused conditions of learning for the events.

Conditions of Learning

There are a number of characteristics of adult learners which have implications for conditions of learning. Such characteristics are related to memory, experience, reaction time, and psychological barriers. Though conditions of learning are considered to be different

Table 1
Instructional Events and Conditions of Learning
Indicated by Adult Learner Characteristics

Instructional Events	Conditions of Learning	
	Diffused	Specific
Gaining Attention* Choosing the Objective	Break complex tasks into series of simpler tasks. Pace slowly. Emphasize relevant cues. Intersperse activities related to learning strategies. Make resources readily available.	Provide questions, prompts, organizers, directions to guide attention in setting realistic objectives. Assist learner in establishing connections between known information & what is to be learned. Assist learner in clarifying expectations using human role model, diagram, or verbal description. Provide learner with life-long objective.
Stimulating (& Assessing*) Recall of Prerequisites* of Related Learning Of Cognitive Structure		Pre-test for related ideas. Identify ideas & practices that need to be unlearned.
Providing Pre-Learning Guidance Unlearning Building Cognitive Structure Learning Strategies		Provide opportunities for unlearning. Present learner with a variety of optional learning strategies. Provide questions and basic ideas regarding cognitive structure.
Presenting the Stimulus*		
Providing Learning Guidance*		
Eliciting Performance*		Elicit performance frequently.
Providing Feedback*		Provide feedback regarding progress frequently, including extent & type of change in competence.
Assessing Performance*		
Enhancing Retention & Transfer*		Provide opportunity for learner to plan & rehearse application of learning to daily living.

*events proposed by Gagne & Briggs.

for different types of learning (Gagne & Briggs, 1979), I have not made this distinction here. I consider the conditions of learning identified from experience and psychological barriers to be generalizable to different learning outcomes. Those conditions related to memory and reaction time may best be suited to verbal information learning since most of the research in these areas has been with verbal learning.

Memory. Knox (1977) describes problems adults have with memory (based primarily on studies of short-term memory) and gives some suggestions for practitioners regarding how to help adult learners overcome memory problems in learning. He describes three phases of memory: registration (exposure to stimulus, acquisition of information, encoding), retention (persistence of encoded information), and recall (search and retrieval).

As age increases, there is an increasing registration deficit whether the stimulus

is presented visually or auditorily with the deficit being greater for the visual than for the auditory. Information which is highly organized during the registration phase is more likely to be remembered. The strength of the registration also affects how well it is remembered. Strong registration occurs when the stimulus is presented at spaced intervals where the intervals are short and adequate time for attending is provided without distraction.

There is little decline in retention ability as age increases as long as what has been stored is meaningful, accurately coded, and not excessive in amount.

As age increases, there is some decline in recall ability, particularly for older adults with low verbal ability. Recall is greatest when the material is meaningful and when the recall conditions are similar to the conditions under which the material was registered. Much of the decline in recall results when the adult is trying to store and respond to new infor-

mation and recall old information at the same time. The process of recalling old information interferes with the new information. Even greater interference may occur when the older adult increases the time spent in searching through accumulated information. It has also been found that errors in recall are more often errors of forgetting than mistakes.

Knox (1977) states that factors related to memory seem to contribute to a decline in problem-solving performance for older adults. These factors include decline in short-term memory, and increased difficulty in organizing complex material, and in disregarding irrelevant aspects in the learning situation. Some of the ways he suggests for practitioners to help adults compensate for memory deficits and deterioration in problem-solving performance may serve as conditions of learning.

- Provide memory aids, e.g., paper and pencil for taking notes, lists of needed information for ready reference and summary materials.

- In presenting new information, use aids that help the learner organize the information, e.g., advance organizers, sets of categories, and generalized structures to assist in grouping information.

- Minimize distracting and irrelevant information and activities in the learning materials and setting.

- Review prerequisite ideas from prior lessons.

- Pace the learning for mastery and continuity.

Table 2 contains both specific and diffused conditions of learning based on research about adult memory. These conditions of learning are suggested for use by designers in conjunction with those posed by Gagne and Briggs (1979, p. 166), and by Briggs (1977, pp. 275-277). It should be noted that certain conditions derived from research and from Knox' suggestions overlap with those of Gagne and Briggs.

Experience. One of the most distinctive aspects of adult learning is the wealth of experience adults bring to the learning situation. Kidd (1973) states that, to some, experience is the principal factor in adult learning. He notes three factors about adult experience as distinct from the experience of children:

1. Adults have *more* experiences
2. Adults have different *kinds* of experiences
3. Adults' experiences are *organized differently*. (p. 46)

Adult educators emphasize the impor-

Table 2
Conditions of Learning Derived from
Research on Adult Memory

Instructional Events	Conditions of Learning	
	Diffused	Specific
Gaining Attention Choosing the Objective Enhancing Retention & Transfer	Minimize distracting & irrelevant information and activities.* Pace for mastery and continuity.*	
Providing Pre-Learning Guidance		
Stimulating Recall		Review prerequisite ideas** from prior lessons.*
Presenting the Stimulus		Present information in small chunks Use aids to help learner organize material.* Allow adequate time to attend.* Present information in different ways to overcome interference.
Providing Learning Guidance		Provide memory aids.* Provide meaningful context.**
Eliciting Performance		Have learner recall in situation similar to that in which stimulus presented. Use measure of cued recall.
Providing Feedback		Identify accuracy/inaccuracy.**
Assessing Performance		Self-pace to allow time for search.
Enhancing Retention & Transfer		Provide spaced reviews** with short intervals in between. Provide summary materials.*

*Indicates Knox's suggestions.

**Indicates overlap with Gagne & Briggs.

tance of the adult's experiences for teaching and learning:

The resource of highest value in adult education is the learner's experience . . . Too much of learning consists of vicarious substitution of some one else's experience and knowledge . . . In teaching children it may be necessary to anticipate objective experience by uses of imagination but adult experience is already there waiting to be appropriated.

(Lindeman, 1961, pp. 6-7.) Knowles includes the role of experience as a main assumption in adult learning theory:

This assumption is that as an individual matures he accumulates an expanding reservoir of experience that causes him to become an increasingly rich resource for learning, and at the same time provides him with a broadening base to which to relate new learning... to an adult, his experience is *who he is*. (1978, p. 56.)

Two types of experience that have an impact on adult learning are: experience which is a function of fulfilling adult roles (life experience), and experience related to feelings and ideas arising from pre-adult learning encounters. Bergevin,

McKinley, and Smith (cited in Apps, 1981), call the combination of these two kinds of experience "internal knowledge," as opposed to "external knowledge," which is what is to be learned (p. 76).

Life experience and experience with prior learning (adult or pre-adult may have positive or negative effects on a new learning experience. Apps (1981) points out that having a large amount of life experience often causes paradoxes for adult learners on examinations because it is difficult for them to choose a single answer.

Knowles (1980) addresses the implications of adult experience for educational practice. Some of these implications can serve as conditions of learning in designing learning experiences for adults:

- Emphasize practical application by illustrating new concepts and ideas with life experiences drawn from the learners.
- Build experiences into the lesson which help adults learn to learn from experience by providing opportunities for them to look at themselves more objectively and to free their minds from preconceptions.
- Gear presentation of resources to the levels of experience of particular

learners.

- Help learners apply new learning to their experiences to make learning more meaningful and integrated.

Experience with prior learning, both adult and pre-adult, has implications as diffused conditions of learning since these experiences will determine the learners' attitudes toward the learning situation and the style with which they approach the learning situation.

- Provide a supportive atmosphere, and establish a cooperative relationship between the learner and the instruction to facilitate positive attitudes toward learning.

Life experience in particular has implications for specific conditions of learning. Table 3 contains the conditions of learning implied by the wealth of experience the adult brings to the learning situation.

Reaction Time. Knox (1977) describes reaction time as the time it takes to respond to a stimulus, and as involving stimulus perception, transmission of information to the brain, and response selection. He describes changes in reaction time as a result of physiological changes in the brain and nervous system: In young adulthood, at about the age of twenty, reaction time peaks; in middle and old age, it slowly declines. Adults compensate for their reduction in reaction time by giving increased attention to accuracy, by carefully attending and responding to stimuli, and by avoiding situations that involve time pressures and potential surprises.

- Avoid placing the adult in timed, high pressure situations (Apps, 1981).

Related to reaction time is the speed or pace of the learning situation:

The speed or pace at which learning occurs is one of the major age-related influences on adult learning effectiveness. Adults of any age, but especially older adults learn most effectively when they set their own pace, take a break periodically, and fit the distribution of learning episodes to the content. (Knox, 1977, p. 440.)

- Help adults improve speed and accuracy by providing clear instructions and reinforcement procedures (Knox, 1977).

One of the reasons for using instructional events and conditions of learning in designing lessons and materials, particularly of the self-instructional type, is to promote efficiency in learning. Apps states:

For those instructors who hold effi-

Table 3
Conditions of Learning
Derived from Wealth of Experience

Instructional Events	Conditions of Learning	
	Diffused	Specific
Gaining Attention	Provide supportive atmosphere, cooperative relationship.	Tell of a work or life experience that relates to the content to be learned, or elicit such an experience from the learners.
Informing the Learner of the Objective, or Choosing the Objective		Provide opportunity for learner to free mind from preconceptions about learning.*
Stimulating Recall of Prerequisites		Have learner recall experiences that involve required or related prerequisites.
Presenting the Stimulus		Gear presentation to learner's level of experience.* Present information or skills in context of life or work situations drawn from the learners. Help learner establish connections between organized material & personal experience.*
Providing Learning Guidance		Use examples of work or life experiences as cues, prompts, links.
Eliciting Performance		
Providing Feedback		Reinforce use of work or life experience in new learning.
Assessing Performance		Ask learner to apply information or skills to past experience. Provide an open-response assessment
Enhancing Retention & Transfer		Have learner speculate upon how new learning could have changed past experiences, or may change future.

*Knowles

ciency in learning as a major guide for their activities, rethinking is necessary. Efficiency, meaning in this instance the speed at which learning can take place, is a problem for the adult learner. (1981, p. 87.)

Perhaps by accounting for the adult's slower reaction time in the conditions of learning used to design lessons and materials, designers can increase learning efficiency for the adult learner. The specific and diffused conditions of learning implied by the adult's slowed reaction time appear in Table 4.

Psychological Barriers. Apps (1981) identifies three psychological barriers of adults that interfere with learning: guilt feelings, recall of previous formal learning, and lack of confidence as a student.

The adult's feelings of guilt about the effects of his role as a student on his family (e.g., less time with family, less money coming in) cannot be dealt with as conditions of learning for just any type of content. However, in the event of enhancing transfer, opportunities could be provided

that assist the learner in transferring the new learning to family situations when the content is appropriate for such transfer.

Recall of previous formal learning has been mentioned earlier in this paper as a part of experience which could have positive or negative effects on learning. Diffused conditions of learning were suggested to enhance positive attitudes toward the learning situation.

Lack of confidence as a student manifests itself in the adult learners' doubts about their ability to study and capacity to learn. Many adults fail to see that they are already learners in the informal learning situations in which they participate as parents, members of a community, and professionals. By drawing upon the experiences of adults in real-life learning situations, we can assist them in appreciating the value of informal learning experiences for formal learning.

Lack of confidence as a student implies several specific conditions of learning which are summarized in Table 5.

Table 4
Conditions of Learning
Implied by Reaction Time

Instructional Events	Conditions of Learning	
	Diffused	Specific
Gaining Attention	Allow self-pacing* when possible.	
Informing the Learner of the Objective, or Choosing the Objective		Provide clear expectations related to accuracy, speed, size of chunk.
Stimulating Recall of Prerequisites		
Presenting the Stimulus		
Providing Learning Guidance		
Eliciting Performance		Provide clear instructions.* Emphasize accuracy rather than speed when possible. Allow time for accuracy.
Providing Feedback		Reinforce accuracy.* Reinforce increases in speed.*
Assessing Performance		Provide clear instructions. Emphasize accuracy rather than speed when possible. Allow time for accuracy
Enhancing Retention & Transfer		Provide experiences in anticipating potential surprises in different situations.

*Knox

Table 5
Conditions of Learning Implied by
Lack of Confidence as a Student

Instructional Events	Conditions of Learning
Gaining Attention	
Informing the Learner of the Objective, or Choosing the Objective	
Stimulating Recall of Prerequisites	Remind the learner that he has learned concepts & skills related to the learning at hand
Presenting the Stimulus	
Providing Learning Guidance	Suggest ways to study or practice.
Eliciting Performance	
Providing Feedback	Point out misperceptions.* Provide supportive comments for both correct and incorrect performance.
Assessing Performance	
Enhancing Retention & Transfer	

*Apps

Developing or Selecting Media

"Media are the physical means for presenting stimuli to the learner" (Briggs & Wager, 1981, p. 114), including books, charts, films, photographs, field trips, computer-assisted instruction, lectures, and discussion.

Gagne and Briggs (1979), and Briggs and Wager (1981), point out that learner

characteristics are a factor in media selection. Gagne and Briggs state that agreement has not been reached on which characteristics are important, but that educators have posed characteristics such as learning style, reading ability, and family background (1979).

Knox (1977) states that the appropriateness of resources (media) for

adults is dependent on such learner characteristics as interest in the topic, opportunity for application, level of education, and age. In addition, he states that the effectiveness of learning resources also depends on interests at different stages of adult development, memory, and pacing.

Vision. Apps (1981) describes vision as gradually declining from ages 18 to 40, sharply declining for many from ages 40 to 45, and less rapidly declining from age 45 up. After age 18, there is a slow decline in the ability to adapt to the dark, and the field of vision narrows somewhat. Ways to help adults compensate for age-related changes in vision (besides obtaining needed corrective lenses) should be considered in selecting, developing, and using media:

- Provide large, clearly produced visual materials (Apps, 1981).
- Make certain that light conditions are proper (Apps, 1981).
- Combine audio and visual presentation (Apps, 1981; Knox, 1977).
- Increase contrast by increasing illumination, reducing glare, closer seating, large type, and great contrast between type and background (Knox, 1977).
- Allow longer exposure time (Knox, 1977).
- Simplify sequences of information or exposure (Knox, 1977).
- Allow more time for adaptation between lighted and darkened surroundings (Knox, 1977).

Hearing. Knox (1977) states that ability to hear sounds gradually declines until the fifties, then impairments increase more rapidly. Pitch discrimination declines gradually between the twenties and fifties and then drops more abruptly. Apps (1981) states that as age increases, we hear more slowly and it takes longer to translate the meaning of sounds. "Older adults also have more difficulty screening out interfering noises" (Knox, 1977, p. 314).

Attention to changes in hearing should be considered in the selection, development, and use of media. Ways to help adult learners compensate for decline in hearing include the following:

- Enunciate clearly (Knox, 1977). Talk slowly and deliberately with sufficient volume (Apps, 1981).
- Provide sound amplification in a large room (Apps, p. 86).
- Face the group so nonverbal cues can be received (Apps, 1981), enabling use of facial and lip cues (Knox, 1977).
- Reduce background noise (Knox,

1977).

Memory. Older adults can be given assistance in compensating for inadequacies in memory which result in difficulty with recalling and verbally expressing what has been learned (Knox, 1977).

- Use visual displays such as posters to evaluate learning (Knox, 1977)

Learning Strategies and Preferences. It is difficult for some adults to learn new ideas through reading, and easier for them to learn the same ideas from other media such as conversation or demonstration (Knox, 1977). Also, adults "tend to persist and learn better when they are able to use preferred resources" (Knox, 1977, p. 443).

- Accommodate their preferences by providing a variety of media or at least two media from which the learner can choose. Near the end of a lesson presented by a videodisc/microcomputer system for example, the learner is given a choice of two kinds of review—review of a short video segment illustrating the achievement of the purposes of an interview, or review of a list of the purposes to be achieved in an interview.

"Compared to children, adults have more experiences; adults have different kinds of experiences; and adults' experiences are organized differently."

Cross (1979) reported that surveys have indicated that adults favor a variety in learning methods, with 75 to 80 percent favoring something other than lecture. She also reports that most adults prefer more interactive and action-oriented learning to passive, non-interactive learning; and, that it is believed that more active learning modes would be especially appealing to the educationally disadvantaged. Cross attributes this preference for active learning to the fact that adults usually want to be able to use the knowledge and skills they learn outside of the learning situation.

Experience. Knowles (1980) suggests that the use of experiential techniques such as group discussion, case studies, simulation, role-play, skill-practice experience, field projects, demonstrations, and seminars help adult learners use their individual experiences as well as those of others as resources for learning. Knox

(1977) states that these kinds of learning experiences help the adult learner bring organized learning and personal experience together.

Assessing Student Performance

Kidd (1973) has indicated that self-assessment is important for adults, and that the adult learner needs guidance in how to go about such evaluation. In addition to evaluating planned learning, he suggests evaluating incidental learning.

Knowles has stated (rather strongly) a rationale for the use of self-assessment with adult learners:

Nothing makes an adult feel more childlike than being judged by another adult; it is the ultimate sign of disrespect and dependency, as the one who is being judged experiences it. (1980, p. 49.)

He views self-evaluation as a mutual undertaking by the learner and instructor where the instructor serves as a role model by accepting feedback about himself and establishing a supportive atmosphere for self-evaluation. Also, the instructor has responsibility for involving learners in developing and carrying

out "mutually acceptable criteria and methods" (Knowles, 1980, p. 58) for self-measurement of progress toward the learning objectives. Knowles suggests that in addition to performance tests and student products, adult learners can be evaluated using case studies and job performance records. He acknowledges that case studies are time consuming, however, the benefit is that effects of the learning experience on the whole person can be detected including changes in outlook, adjustment, and habits. He indicates that job performance records are especially appropriate for learning experiences related to professional performance.

Providing for self-evaluation can serve as a condition of learning for the instructional events, eliciting performance, providing feedback, and assessing performance. Case studies and job performance records could serve as media to

implement these events.

Conclusion

The proposed integration of the characteristics of adult learners into the Gagne-Briggs model of instructional design has resulted in suggestions for components in each of the four stages of the lesson design process. These suggestions have been made to assist designers in developing effective lessons and materials for adult learners. Many areas for further investigation can be identified from the ideas presented here. The following list of questions proposes some areas for investigation which I have not addressed and which I believe merit further consideration.

1. Are there any differences in learning from experiences designed by the Gagne-Briggs model as opposed to experiences designed by the same model extended to account for the characteristics of adult learners? Specifically, what differences exist?

2. Which aspects of learning (cognitive, social, emotional, physical) are enhanced by attention to the characteristics of adult learners? For example: Does attention to adult learner characteristics increase positive attitudes toward learning; and, does this in turn facilitate achievement of the primary objectives of the instruction?

3. Which characteristics of adult learners should be considered in designing instruction for adults? Perhaps some or all of the characteristics presented in this paper should be given attention. Perhaps characteristics not addressed in this paper should be considered, such as time perception, decline in physical strength, and other characteristics. Which characteristics vary with culture, and how do they vary?

4. Which instructional events and conditions of learning derived from characteristics of adult learners are most effective for the different types of learning outcomes; and, which ones are applicable to all learning outcomes?

5. How do we go about analyzing characteristics of adult learners, such as experience, to determine how, when, and where to utilize these characteristics in designing learning experiences for adults?

6. How do we assist adult learners in such processes as unlearning and building cognitive structure?

7. How are other components of instructional systems design such as course organization, delivery systems, needs assessment, and formative evaluation

specifically affected by characteristics of adult learners?

It is my opinion that the Gagne-Briggs model of instructional design is a clear and useful model for designing instruction for adult learners of any age for any type of learning experience. It is limited, however, in that it is based on principles of learning and memory and does not consider other aspects of learning (social, emotional, physical) which may contribute to learning as a more than temporary change in behavior.

Attention to specific learner characteristics can extend the Gagne-Briggs design model to a more holistic view of learning, thus promoting more effective and efficient learning for adults.

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