Meeting the needs of the adult learner in the instructional design environment

Takeisha Henfield
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Abstract
There are an increasing number of adults who are seeking further education and training for various purposes, ranging from English as a Second Language to doctoral degrees. These adults possess different characteristics and require different conditions than traditional younger learners. In an effort to design effective instruction for adults as learners, the basic instructional design process should be understood. Through that understanding, a taxonomy of instructional design models as well as specific models can be discussed. The knowledge of adults' learning needs, plus an understanding of instructional design and its models, can help instructional designers produce more effective instruction for the adult learner.
MEETING THE NEEDS OF THE ADULT LEARNER

IN THE INSTRUCTIONAL DESIGN ENVIRONMENT

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ABSTRACT

There are an increasing number of adults who are seeking further education and training for various purposes, ranging from *English as a Second Language* to doctoral degrees. These adults possess different characteristics and require different conditions than traditional younger learners. In an effort to design effective instruction for adults as learners, the basic instructional design process should be understood. Through that understanding, a taxonomy of instructional design models as well as specific models can be discussed. The knowledge of adults’ learning needs, plus an understanding of instructional design and its models, can help instructional designers produce more effective instruction for the adult learner.
# TABLE OF CONTENTS

ABSTRACT ........................................................................................................... III

TABLE OF CONTENTS ......................................................................................... IV

INTRODUCTION .................................................................................................... 1

METHODOLOGY ................................................................................................... 3

THE ADULT LEARNER ......................................................................................... 5

Andragogy vs. Pedagogy ....................................................................................... 5

What Do Adults Learn? ......................................................................................... 8

How Do Adults Learn More Effectively? ............................................................. 10

INSTRUCTIONAL DESIGN .................................................................................... 14

Principles of Instructional Design ........................................................................ 16

Instructional Goals ............................................................................................... 17

Instructional Analysis .......................................................................................... 18

Entry Behaviors and Learner Characteristics ...................................................... 19

Performance Objectives ....................................................................................... 19

Criterion-Referenced Test Items .......................................................................... 20

Instructional Strategy .......................................................................................... 20

Instructional Materials ......................................................................................... 21

Formative and Summative Evaluation .................................................................. 21

INSTRUCTIONAL DESIGN PROCESS MODELS .................................................. 22

Examples of Instructional Design Models ........................................................... 25

Classroom-Oriented Models ................................................................................. 26

Product-Oriented Models ..................................................................................... 29

Systems-Oriented Models ................................................................................... 31
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONCLUSION AND RECOMMENDATIONS</td>
<td>34</td>
</tr>
<tr>
<td>The Adult Learner</td>
<td>34</td>
</tr>
<tr>
<td>Instructional Design</td>
<td>34</td>
</tr>
<tr>
<td>Designing Effective Instruction</td>
<td>35</td>
</tr>
<tr>
<td>Recommendations</td>
<td>37</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>39</td>
</tr>
</tbody>
</table>
INTRODUCTION

When the process of education is addressed, generally people think about the education of children and young adults. However, there is an increasing number of adults who are deciding to further educate themselves or are forced to educate themselves. According to the National Center for Education (Creighton, 2000), over half, 51.6% of this nation’s adults ages 35 – 64, participate in some form of adult education. Those adults represent many who were pursuing education in order to meet job requirements, but many are not. Because of this increasing number of older Americans seeking education, it is important for educators to understand how adults learn.

In planning for meeting effective objectives, professional instructional designers have developed models that can be followed in order to produce effective instruction. Currently, many instructional design models exist (Gustafson & Branch, 2002). All of these models serve different purposes. However, there is no model that focuses primarily on the specific needs of the adult learner. The question is: how can learning experiences for the nontraditional student align with effective instruction?

This literature review will address several areas, the first being how do adults learn? This question will be addressed first by discussing the difference between andragogy and pedagogy. Different adult choices in education will be discussed, as well as effective learning strategies.

Next, the review will shift into instructional design, the definition, and how it is used. Within this section Robert Gagne’s Principles of Instructional Design (1988), will be used to explain the basic instructional design process. Because instructional design models are keys to the instructional design process, the review will reference models documented within Gustafson and Branch’s Survey of Instructional Design Models (2002). Once the literature of adult learning and
instructional design has been effectively discussed, the reviewer will discuss the adult learner in relationship to instructional design and why there is not currently a specific instructional design model tailored for their purpose.
METHODOLOGY

Multiple procedures were used in order to locate valid and reliable sources. The reviewer used the University of Northern Iowa’s Rod Library to locate information on how adults learn. Also used were the ERIC (Educational Resources Informational Catalog) Silver Platter sources to locate research articles on adult learning using the following keywords; adult learning, instructional design, how adults learn, Malcolm Knowles, and andragogy. ERIC and Rod Library were also used to locate information on specific adult education principles.

When selecting resources from the University of Northern Iowa’s Rod Library, selections were made according to the relevance of the topic. Traditionally, the most recent information is desired for review. However, because of the foundational history of instructional design and adult learning, included in this literature review, initiators of adult learning (Malcolm Knowles) and instructional design (Robert Gagné) must be referenced.

Internet searches of instructional design models led to Gustafson and Branch as well as the recommendation of Dr. J. Ana Donaldson. This source was found to be credible due to the extensive citations as well as the authors’ credentials, and the recommendation to the reviewer. The reviewer used the source, Survey of Instructional Development Models (2002), written by Kent Gustafson and Robert M. Branch, in order to begin the process of finding more valuable and specific information pertaining to the different kinds of instructional development models. Within this text the authors discussed a widely accepted taxonomy of instructional design models, as well as different models within that taxonomy. Gustafson and Branch also discussed other alternatives to their taxonomy of instructional design models. Many of the key words used for searches were found in the Gustafson and Branch publication.
The World Wide Web was used to identify information about the topic of adult learning and instructional design, using many of the same key word searches. Education web sites and web sites that supported the instruction of Performance and Training Technology professors were considered valid.
ANALYSIS AND DISCUSSION

The Adult Learner

Generally people think about the education of children and young adults when the process of instruction is addressed. However, there are an increasing number of adults who are deciding to seek further education for various reasons. The reviewer will identify how the adult and the child learn differently. Various forms of adult education and how adults learn most effectively will be included in this segment.

Andragogy vs. Pedagogy

Malcolm S. Knowles is considered an important figure in adult education. According to the Encyclopedia of Informal Education (Smith, 2002), Malcolm Knowles “was a, perhaps ‘the’, central figure in US adult education in the second half of the twentieth century” (p. 1). Although the term andragogy is accredited to Dr. Alexander Kapp and sometimes to Eduard Lindeman (Hunt, Kilburn, Long, & Murray, 2000), Knowles popularized the term in his work on adult learning. Knowles’ description of andragogy as a learner-centered approach respects the experiences of adults who are self-directed and want to be in charge of their own learning (Williams, 1998).

Williams (1998) states that, Malcolm Knowles has been criticized for creating a distinct separation between pedagogy, the learning of children, and andragogy, the learning of adults. “Knowles is often criticized for introducing a divisive paradigm into the field of adult education; he was certainly responsible for providing teachers of adults with a framework for building our practice” (p. 59). Although Knowles has fallen under disapproval by some, he is still held accountable for being one of the founding fathers within the field of adult education.
Knowles states his observed differences between pedagogy and andragogy in a chart where he describes several learning characteristics of adults and children (Knowles, 1977). The reviewer will describe a few of the differences according to Knowles. The concept of the learner: in a pedagogical view the learner is dependent and in the andragogical view the learner is increasingly self-directed. The role of the learner’s experience: in a pedagogical view, the author suggests past experiences are to be built upon and in the andragogical arena this is a “rich resource for learning” (Knowles, 1977, p. 206). These ideas are what Knowles discusses as being assumptions to learning. These assumptions state that the child learner is dependent upon the teacher to provide and direct learning and in adult learning the student takes charge of his or her own learning. Knowles also states that in the adult learner, past experiences are important for the student in order to understand ideas presented, unlike in the child where the experiences are limited and therefore built upon by the instructor. Stated more plainly by Elizabeth Williams (1996):

A major difference between teaching children and helping adults learn is that children usually come to the classroom with very short, simple life stories. This is not to say that the stories are always happy or easy-to-read but rather to emphasize that the life stories of adults are longer, more complicated, and loaded with characters, conflict ethical dilemmas and sub-plots that relate to career, family and financial issues. (p. 13)

Merriam and Caffarella (1999) explain why these past experiences are so valuable. They state that learning happens when adults connect what they have learned from current experiences to experiences in the past or even possible future experiences. These experiences are
compounded over time. “Learning from experience is cyclical in nature; whatever we learn from one experience is then applied to new experiences” (p. 246).

Knowles identified process elements as the individual elements used in developing instruction. Some differences due to age include planning; which in the pedagogical stance is done primarily by the teacher, and in the andragogical view, is done by “participative decision making” (Knowles, 1977, p. 205). Goal setting, another process element, in the pedagogical view is done primarily by the teacher and in the andragogical view done by mutual negotiation. Evaluation in the pedagogical view is done again primarily by the teacher and in the andragogical view, by mutual assessment of the students’ self-collected verification. Finally, the climate in the pedagogical view is “formal authority oriented, competitive judgmental” (p. 205), while in the andragogical arena it is “informal, mutually respectful, consensual, collaborative and supportive” (p. 205). According to Knowles (1977):

The big difference between a pure andragogue and a pure pedagogue is this: the pedagogue not only is willing to accept dependency, but feels so much more comfortable teaching dependent personalities that the teacher will tend to do everything one can to maintain dependency on the part of the learner, whereas the andragogue, while able to accept dependency at a given time and moment, or time with a given person, has a built-in sense of obligation to do everything one can to help that person move from dependency toward increasing self-directiveness. In other words, the andragogue has a value system that places self-directiveness on a much higher level of dependency and so will do everything one can to help a learner become increasingly self-directive in his or her learning. (p. 206)
Knowles’ perspective on the differences between the adult and child learner is that children are almost completely dependent upon the instructor for direction and because of this the instructor operates in a more authoritative and formal climate. The adult learner is self-directed and self-motivated and therefore more able to participate in a comfortable and respectful learning environment.

Knowles states that the child educator creates an atmosphere of dependency for the child while the adult educator should try to foster a climate of self-directed learning. Although this was a popular methodology to follow in the past, today “children are encouraged to become responsible for their own learning in ways that Knowles originally asserted were appropriate only for adults” (Williams, 1996, p. 59). This is reflected in the growing popularity of constructivist leaning environments for children. A critique of the question of andragogy vs. pedagogy stated, “Knowles’ approach is not dissimilar to the present constructivist view. But Knowles in fact suggested that children as well can be self-directed, are good problem solvers, and can be internally motivated” (Hunt, Kilburn, Long, & Murray, 2000, p. 1). This idea of children as self-directed learners was not addressed in Knowles’ early works. However, he did ask the readers of his chart to “please read as poles on a spectrum not as black-and-white” (Knowles, 1977, p. 211).

What Do Adults Learn?

When considering the number of adults pursuing further education, a natural question arises as to what are the adults learning? Williams (1996), addresses the various purposes in which adults may choose to educate themselves, including the following areas of interest.

Personal interest and leisure courses are described as the courses adult may decide to partake in order to learn a new hobby like sewing or woodworking. These would also include
any health and fitness classes that an adult may pursue. Workplace Training courses includes any on the job training and all courses that are offered for employees held around business hours.

Computer courses are becoming more popular as the usage of the computer increases in homes and on the job. It has been “speculated that half of what most professionals know when they finish their formal training will be outdated in less than five years, perhaps even months for those in technology related careers” (Merriam & Caffarella, 1996, p. 2).

Technical Skills training are classes that address the need for the constant upgrading of skills. These classes are usually related to workplace machinery. Because of the increase in technology, companies are now constantly offering technical skills training courses. Job search skills programs, many adults partake in these sorts of classes to help with career planning, interview skills, and resume preparation. Welfare-to-work programs can also be included in this category. Williams (1996) includes the programs for unemployed and governmentally-funded individuals.

Williams also incorporates additional categories for adult basic education. This includes English-as-a-Second-Language programs, and certification, diploma and degree programs that are also typically regulated and funded by governments, licensing bodies, or professional associations. These also may include the college and graduate courses that many 25–65 year-old adults pursue. When William’s publication discussed why adults take certain classes it stated, . . . some adults may be unsure about why they are in particular course. . . . In the absence of long-term planning adults may find themselves in courses that are inappropriate, irrelevant or at a level that is too advanced. . . . Furthermore, adults may also come to class for reasons that have nothing to do with education. For example, taking a course
may provide an escape from home, and opportunity to meet new friends, or a way to stay on government benefits. (p. 17)

Williams discusses many other reasons adults choose to educate themselves, she tells us most adults come into classes because they are genuinely interested in the intended classroom material and are willing to learn.

How Do Adults Learn More Effectively?

Adults come to the learning environment with more experiences than children. How can an instructor teach people with all these different experiences? Draves (1984) states, “A prerequisite to helping adults learn is to understand how they learn...the way to approach this diversity in learners is with variety in your teaching” (p. 7). Draves goes on to discuss some major characteristics of adults that contribute to how they learn.

Draves offers that there are four main characteristics that make each individual unique: (a) emotional, (b) physical, (c) social, and (d) mental. By understanding these traits in learners, teachers can better help reorganize the thoughts and skills of their learners. Beginning with emotional characteristics; teachers must understand, “adults’ emotional states are inextricably tied up in their ability to learn” (Draves, 1984, p. 8). Within all instructional situations, educators should try to induce positive feelings within students in order for their knowledge acquisition to be improved. “In helping a person learn, the teacher must be able to help create a positive emotional climate, and the key to that state is one’s self-image” (Draves, 1984, p. 8). Because adults come from a variety of experiences, the reason for a less than positive self-image may come from a variety of sources. However, low-self esteem may “stem from natural feelings about inadequacy and growing older and some are induced artificially by society” (Draves, 1984, p. 8).
Another important aspect of adult learning is the physical characteristics of the learning environment. “Adults are more attuned to comfortable surroundings, more sensitive to discomfort” (Draves, 1984, p. 9). As we age, all adults even the younger adults, are declining physically. Draves states that, “physique and intelligence are related because our bodies influence how and whether we [adults] learn” (p. 9). Because of this, adults’ physical state affects their capacity to learn.

Unlike the declining physical state of adult learners, their mental state may be much sharper in the learning situation. “Adults are eager to learn – or else they would not be there” (Draves, 1984, p. 10). Draves identifies several aspects of the adult mentality that relate to helping them learn. A readiness to learn suggests that adults come to class ready to acquire new knowledge and skills. This is true because most adult learning is voluntary. Because adults come to class with this readiness to learn, they come with a purpose or problem orientation. “Adults want to learn to solve or address a particular problem, and are more satisfied with their learning if it applies to their everyday experiences, is practical, or is current” (p. 11). This readiness to learn, and the choice to pursue further education is what makes adults responsible for their own learning. When learning aids adults in being more effective in something that they value, they are likely to be intrinsically and positively motivated (Johnson, 1989; Wlodkowski, 1985). Therefore the success rate of mature learners is heightened.

The last aspect of the adult mentality, that Draves discusses, is that of time-perspective. As people grow older their idea of time changes, and becomes less expendable and more limited. As an adult, a year into the future seems like a short amount of time, as to where ten years in the past seems like it was not that long ago. Because of this, adults prefer to learn material that can be used today, as opposed to what can be learned and used in the future. This makes “adults
more concerned with specific, narrow topics of relevance than broad, generalized or abstract subjects” (p. 11). These three aspects of adult mentality are directly related to one another; together, “a readiness to learn, problem orientation, and specific time perspective contribute to an internal motivation to learn” (p. 11).

The final and most important social characteristic of the adult learner is the idea that the adult learner comes into the learning situation with a variety of experiences. Williams (1996) states that the more the educator knows about adults’ past experiences the more the teacher or facilitator can effectively encourage learning. However, educators must decide “if education includes taking responsibility for helping adults ‘unpack’ and lighten their psychological and emotional burdens or simply teach a particular subject” (Williams, 1996, p. 13).

Williams (1996) briefly discusses some principles that help facilitate learning in the adult learning environment. Like Draves, Williams states that adult learning is enhanced when “the learning climate fosters self esteem and interdependence” (p. 56). Because the adult knows what they want to learn, they value a learning environment that supports them in their learning without direct dependency on the educator. Adult learners also want learning outcomes to have meaning for them in their lives.

Learning is enhanced when the learner plays an active role in decision-making and planning for the learning experience and when authority is shared (Williams, 1996). This is a difference often discussed between children as learners and adults as learners. Older learners want and need to be treated like adults in all learning environments; this means that the adult learner needs to have some direct control over what happens within their learning. Again in Knowles’ (1977) discussion of process elements, he writes that the pedagogue (child learner) is dependent upon the teacher for direction and the adult learner is capable of directing her or his
own learning and learners and teachers make classroom decisions collaboratively. Williams' (1996) final three principles discuss the importance of a synergistic view. She states that in order for adults to effectively evaluate their own learning they must be able to transfer their learning into other areas of life. When they do this they will have a synergistic view.

The Adult Educator

It is important to also review effective characteristics of the adult learner. Because of special considerations and accommodations that should be implemented with the adult learner, it is necessary to review some characteristics of the adult educator. Grabowski (1976) states:

Various reviewers have determined characteristics that also make a successful adult educator. Intrinsically adult educators should be good communicators and listeners.

Instructors should be open-minded and allow adults to pursue their own interests. These educators should value learning enough to know the importance of continuing their own education, and be able to evaluate and appraise educational programs. (p. 10)

As adults teach other adults, it is important that they understand the process of adult learning and view it as necessary and attainable.

Dean and Ferro (1991) state that educators should adopt the viewpoint that adults can change and learn. Educators should not hold on to past beliefs that adults cannot learn. Instructors should be enthusiastic about the learners as well as the topic they are teaching. Furthermore, educators should have patience and a willingness to listen to others carefully, and they should be knowledgeable in the topic they are teaching. More obvious to learners, instructors should be able to articulate the material clearly, be flexible, open, and possess a sense of humor. These characteristics are key to an educator's teaching style, "teaching style consists of the characteristic ways in which you help adults learn" (Dean, 1994, p. 4). After educators
identify whether they possess the characteristics of a good teacher, they must develop appropriate, effective instruction and delivery strategies.

**Instructional Design**

Identifying characteristics of both the educator and the learner are important components of the learning process. When planning for learning, these traits are just a portion of the many aspects that must be considered. “Instructional design involves organizing and using tools of the mind and tools of learning, to improve the conduct of education and training” (Johnson, 1989, p. 2).

Johnson (1989) states that instructional design is based on two ideas. The first is that, “the common goal of education and training is the development of human potential” (p. 4). This is why it is important to understand the characteristics of learners as well as be able to identify the strengths and weaknesses of the educator. The second is that “there is sufficient knowledge about the nature of learning to improve the process of developing that potential” (p. 4). Through the historical research of education and learning, Johnson feels that enough data has been collected to aid educationalists in effective learning for all students.

Instructional design integrates the knowledge of several disciplines in order to produce the desired outcomes within the learning environment. “The foundations of instructional design are in the behavioral and social sciences-in particular in behavioral, developmental, social, and cognitive psychologies” (Johnson, 1989, p. 4). Instructional design also draws upon the fields of management and computer science. Examples are systems analysis and management theory as well as organizational development. Because instructional design is built upon so many different sciences, Johnson defines it as an “emerging, applied, and creative science” (p. 14).
The major difference between conventional curriculum development and instructional design is philosophical. Within instructional design, activities are based upon the audience characteristics and instructional objectives. The learners’ perspectives also drive the instruction within instructional design. This goal is unlike traditional instruction, which is to acquire a captive audience based on predetermined activities. However, instructors of both should be constantly aware of student reactions and their learning throughout a course (Johnson, 1989).

The second difference Johnson discusses is that instructional designers “consciously use a systematic process to create instruction, whereas most traditionalists do not” (p. 13). Dean describes instructional design as a “systematic decision making process that allows educators to identify the most important elements of the learning process and to make decisions about what will be the most effective way to plan and implement a learning activity” (Dean, 1994, p. 2). Gagné and Briggs (1988) discuss this systematic development of instruction within their foundational publication, *Principles of Instructional Design*. They stated that systematic design encourages educators to set goals so they can monitor when objectives have been met. This process gives educators a tool in which to gage and maximize individual learning potential. “The explicit assumption of instructional design is that its use will yield better instruction [and] more effective education and training” (Johnson, 1989; Richey, 1986). Johnson concludes,

*Instructional design is an evolving discipline. Drawing on social science, management science, and information science, it is becoming both a body of knowledge about learning and learners, and a process for organizing and managing the development of complex instructional programs...it makes educators and trainers more conscious of their instructional decisions, and helps to focus their instructional expectations.* (p. 14)
Although instructional design has been found to be fundamental to the building of successful instruction, it is a process, and this process is “a method to achieve an end, not an end in itself” (Dean, 1994, p. 14). However, when instructional design is appropriately applied it “promotes creativity during development and results in instruction that is both effective and appealing to learners” (Gustafson & Branch, 2002, p. 2).

**Principles of Instructional Design**

Robert Gagné (1916-2002), best known for his *Conditions of Learning*, contributed significant knowledge to the processes of instructional design within his text *Principles of Instructional Design* (1988). He believed that instruction does not happen haphazardly; it must be planned, or designed, in order for it to effectively serve its purpose, which is learning. “Instruction is planned for the purpose of supporting the processes of learning” (p. 18).

“The purpose of instruction is to arrange external events that support these internal learning processes” (Gagné & Briggs, 1988, p. 18). In order to achieve this, a system must be developed. “An instructional system may be defined as an arrangement of resources and procedures used to promote learning....Instructional systems design is the *systematic* process of planning instructional systems” (Gagné & Briggs, 1988, p. 20). In order to begin this systematic process, the designer must establish a rationale for what is going to be learned. This requires the designer to understand the original reasons that the instruction was chosen for development. In the adult situation this could be for career advancement, to learn a second language, or simply for leisure purposes. Recognizing the need of the existing problem is crucial for beginning the step-by-step process of developing a system of instruction.

Gagné states that all stages in any instructional systems model can be categorized into one of three functions: (a) identifying the outcomes of the instructions, (b) developing the
instruction, and (c) evaluating the effectiveness of the instruction. Within his text, *Principles of Instruction Design* (1988), he describes a general nine-step design process, which instructional systems are derived from. The steps of the process are as follows:

**The Derivation of an Instructional System**

1. Instructional Goals
2. Instructional Analysis
3. Entry Behaviors and Learner Characteristics
4. Performance Objectives
5. Criterion – Referenced Test Items
6. Instructional Strategy
7. Instructional Materials
8. Formative Evaluation
9. Summative Evaluation

A detailed description of each step will be given in the following sections.

**Instructional Goals**

After establishing the need for instruction, which is the foundation of the initial design, goals must be established. A general goal is defined by Gagné (1988) as “a desirable state of affairs” (p. 20), however he states that the role of the instructional designer is to distinguish between a general goal and an instructional goal. *Instructional goals* are those that are attained through instruction. An example of a goal would be: every able adult will obtain employment. This is a general goal that cannot be realized through instruction. However, every willing adult shall have job search skills, is a goal that can be realized through instruction.
Once the goals of instruction have been formulated the designer must conduct a *needs analysis*. The need is the difference between what currently exists in the learning situation and what is desired, the goal (Gagné & Briggs, 1988). In the earlier example, the instructional goal was, all willing adults shall have job search skills. The difference between the current job search situation and the goal could be; statistically, job-searching adults do not know how to use Internet job search engines. This determines that there is a need for adults to learn how to use the Internet in order to have access to more jobs.

*Instructional Analysis*

Gagné’s second discussed step is the instructional analysis. This is the step of the learning process that discusses what procedures need to be achieved before the learner can accomplish the overall goal. Gagné discusses several classifications of instructional analysis that can reveal the component skills that the learner has to learn.

Task or procedural analysis determines the list of tasks or procedures the learner must reach in order to advance to the next step. This analysis would inevitably lead to the acquisition of the instructional goal. Information-processing analysis is the mental processes a learner must go through in order to learn a complex skill. Task classification is the “categorization of the learning outcome into a domain or sub domain of types of learning” (Gagné & Briggs, 1988, p. 23). Gagné states that classification into the five major types of learning outcomes (goals) can help determine if instruction is being approached in the most effective way. Grouping tasks into the appropriate categories of verbal information, intellectual skills, cognitive strategies, motor skills, and attitudes, can guide instructors in the most effective teaching methods for those tasks.

Finally, the last type of analysis discussed by Gagné is the learning-task analysis. This task analysis identifies the subordinate skills the learner must have in order to achieve the task. If
the need is for adults to use the computer for job search skills, they must first be able to read, sign on to the Internet, type, and use a mouse. “The purpose of a learning-task analysis is to reveal the objectives that are enabling and for which teaching sequence decisions need to be made” (p. 24). After primary skills are identified, there can be a continuation of the process.

Entry Behaviors and Learner Characteristics

The third step can be completed concurrently with the second step, per Gagné. The purpose of understanding the learners’ entry behaviors and characteristics is to determine what the learners already know and how they learn. Some learners will know more and therefore not need or want to begin at remedial levels. It is important for instructional designers to know and understand their learners, especially if they are designing instruction for adults. Adults have a readiness to learn; therefore it is imperative that the relevance of the class is actualized in the beginning of instruction (Draves, 1989). There are different methods that designers can use in order to determine learners’ entry behavior. Surveys, statistics, questionnaires, interviews and observation all are examples of tools that can be utilized for this purpose (Dick & Carey, 1994). However, Gagné (1988) states, “a better procedure is to interview and test the skills of the target population until you know enough about them to design the instruction appropriately” (p. 25).

Performance Objectives

During the fourth step of Gagné’s Principles of Instructional Design, he states step one’s needs and goals must be actualized into performance objectives. “Performance objectives are statements of observable, measurable behaviors” (p. 26). Meaning the goals and instructional planning that have been accomplished at this point in the planning process can now be used to help the designer establish concrete behaviors in order for the learners to determine if they are learning the information properly and in the preferred time period.
Four functions of performance objectives are outlined by Gagné. Step one, is to provide a means for determining if the instruction relates to the accomplishment of goals. The second step provides a means for focusing the lesson planning upon appropriate conditions of learning. The third is to guide the development of learner performance. Finally, the last step is to assist learners in their study efforts.

The authors discuss the common fallacy of using the predetermined instructional plans and evaluation to establish performance objectives. “It is apparent that objectives should guide the instruction and evaluation” (Gagne & Briggs, 1988, p. 26). Instruction and evaluation should influence performance objectives only after the stated performance objectives have proven ineffective or incomplete.

Criterion-Referenced Test Items

After the performance objectives are stated, a tool to measure student performance must be prepared. There are multiple purposes to the development of criterion-referenced test items discussed by Gagné and Briggs (1988). The first is to “assure that an individual possesses the necessary prerequisites for learning new skills” and the second to “check the results of students learning during the progress of a lesson” (p. 27). Criterion referenced test items can be utilized throughout the instructional design process.

Instructional Strategy

“By instructional strategy we mean a plan for assisting the learners with their study efforts for each performance objective” (Gagné & Briggs, 1988, p. 27). This can also be viewed as a strategy for instruction, or the method in which instruction will be delivered. There are many ways that instruction can be delivered to students. Instruction can be facilitated by teachers or by students, depending on the environment. In the teacher-led environment, the instructor gives
directives to the learners and makes steps to achieving the performance objectives. This is usually done without the students understanding the content of the learning or knowing that the instructional steps they are reaching are leading to a bigger goal. An example of this is the natural progression of elementary math; students first learn numbers, then addition, subtraction, multiplication, and so on. This all occurs without the student necessarily knowing the ultimate goal of Trigonometry.

Within learner-centered instruction the instructor directly communicates the ultimate goal of the class to the student and student learning is done at a self-pace. This is usually done by completing the necessary readings or self checks to make sure self knowledge is taking place. This type of learning is most effective in the andragogue, or adult learning, environment.

*Instructional Materials*

"The word, materials here refers to printed or other media intended to convey events of instruction" (Gagné & Briggs, 1988, p. 29). The selection of instructional materials is very important and may be the most expensive process within instructional planning. The biggest concern with selecting materials is choosing existing materials for convenience or to economize. When choosing pre-existing materials, sometimes objectives are forced to be changed. Designers should be aware that often times, they might need to produce new and innovative instructional materials. "The more innovative the objectives, the more likely it is that a greater portion of the materials must be developed since they are not likely to be available commercially" (Gagné & Briggs, 1988, p. 29).

*Formative and Summative Evaluation*

The most frequently overlooked portion of the development of instructional material is the formative evaluation. "The purpose of formative evaluation is to revise the instruction so as
to make it as effective as possible for the largest number of students” (Gagné & Briggs, 1988, p. 30). This requires an evaluator interacting with the learner throughout the instruction to understand how and if the instructional materials are being used for the purpose intended.

Because of this direct interaction with the learner by the evaluator, which often times is the instructor, a loop emerges. This formative evaluation may (and should) lead to constant revision and review of the instructional process. This constant revision makes lessons self-sufficient and better utilized by a larger number of learners.

Summative evaluation differs from formative because an outside evaluator often carries out the evaluation. This ultimate evaluation is done after the instruction has been carried out. Many times this instruction has already been adopted by a large number of students, and sometimes after a period of years. The purpose for this summative evaluation is to “study the effectiveness of a system as a whole” (Gagné, 1989, p. 31).

Planning instruction is a systematic process, and because of its “attention to consistency and compatibility of technical knowledge” (p. 15) the process is labeled the systems approach, as a general term. Many models of instructional systems design exist. In the following, Gagné provides a general description of the design process, with general descriptive characteristics.

**Instructional Design Process Models**

“Stages of design are often presented as a flow diagram or model to be followed in the design of instructional materials” (Gagné, 1989, p. 34). It is these stages of design that authors Gustfason and Branch (2002) chose to research and document in order to better utilize these tools. Authors discuss the value of visually representing instructional design processes:

Models help us conceptualize representations of reality. A model is a simpler representation of more complex forms, processes and functions of physical phenomena or
ideas. Models, of necessity, simplify reality because often reality is too complex to portray. (p. 1)

Many learners grasp more information if they are presented with it visually. Visual learners get more information from visual images (pictures, diagrams, graphs, demonstrations) than from verbal material (written and spoken words), and vice versa for verbal learners (Cuyamaca College, 2003).

Instructional design is a creative process; the designer is creating effective instruction. It is also a complex process with multiple steps that the designer must complete before concluding the design process. The purpose for instructional design models is to visually communicate steps in order to produce effective instruction. “Instructional development models provide communication tools for determining appropriate outcomes, collecting data, analyzing data, generating learning strategies, selecting or constructing media, conducting assessment, and implementing and revising result” (Gustafson & Branch, 2002, p. 2).

Like Gagné’s familiar description of instructional systems, there are five major activities that Gustafson and Branch discuss:

1. Analysis of the setting and learner
2. Design of a set of specification that are the most relevant and effective for the setting and learner
3. Development of materials
4. Implementation of the results
5. Formative and summative evaluation

These designs are very similar to the nine step procedures of Gagné’s *Derivation of an Instructional System* (Gagné & Briggs, 1988). These five steps as discussed by Gustafson and
Branch are the generic ID model referred to as ADDIE, it is the simplicity of the ADDIE that allows it to survive. The acronym of ADDIE did not become popular in terminology until the 1990’s, however the process has existed since circa 1975 (Clark, 2004). However, because of the advances within the field of instructional design, designers question its “effectiveness and appropriateness” (Malachowski, 2002).

Although ADDIE is one of the original instructional design models, many different models exist and serve different purposes. Because of this, Gustafson and Branch developed a taxonomy in order to organize the research and literature. This taxonomy is also an organizational tool for helping designers evaluate and select appropriate models to use. The categories the models are placed into are classroom, product, and system models. They are categorized due to how the instruction is applied; whether instruction is intended for individual classroom instruction (*classroom*). The end result is a product to be used by others (*product*). Or, finally, the model is used by organizations to solve problems or achieve goals (*system*). This beneficial taxonomy discusses different models of instruction, however these models can be used in multiple settings successfully.

Gustafson and Branch (2002) also take into consideration the assumptions of the creator of the particular model in order to categorize them. In each of the three categories; classroom, product, and system creators share similar attributes. However the classroom environment presents special challenges:

The classroom perspective typically assumes that: little time will be devoted to front-end analysis; the development and learning environments will likely be relatively low-tech; the amount of tryout and revision will be limited, and the amount of dissemination beyond that classroom will be very low. (p. 15)
These are circumstances that many educators face. Therefore, many instructors may choose to review the classroom models for adoption.

Gustafson and Branch (2002) document that the creators of the models discussed assume that the product portion of the taxonomy will result in the creation of a specific product. Product development models require substantial resources, highly trained individuals, and often a manager. Usually the products developed are original in nature and technology driven.

Finally, system-oriented models are larger and more complex. These models make the assumption that “a substantial amount of instruction will be created, such as an entire course or entire curriculum” (p. 16). Depending on the setting in which this instruction is developed, technology and time needed for development varies; however, because of the larger developmental scope, tryout and revision time is usually high.

Examples of Instructional Design Models

Many instructional design (ID) models exist (Reigeluth, 1983). It is difficult and relatively impossible for them all to be known. However for the scope of this review, there will be a discussion of widely accepted ID models for each category within Gustafson and Branch’s (2002) taxonomy. It is important to remember that although models are categorized for specific uses and users, they are often used outside of this scope of discussion. When focusing on the adult learner, it is important to review different models in order to understand which type of model best fits a particular group of adults.

Several important elements to adult learning have been discussed. Dean and Ferro (1991) discuss the importance of educators’ ability to change and learn; therefore, it is important to choose a model that best supports this characteristic of the adult learner. Because adults are self directed learners and like to play an active role in their own learning (Williams, 1996), a model
should be chosen that produces an outcome of instruction that is cohesive to learners. Finally, because time is a factor it is important that a model is considerate of the learning audiences' time perspective (Dean, 1984).

Classroom-Oriented Models

Classroom-oriented models are ideally used by educators when planning classroom instruction. “Users include elementary and secondary schoolteachers, community college and vocational school instructors and university faculty. Some training programs in business and industry also assume this classroom orientation” (Gustafson & Branch, 2002, p. 18). When developing classroom instruction teachers must identify the situation within which the instruction will exist (i.e. elementary, secondary, college).

Often, teachers are developing instruction for a specific period of time with limited resources. Because of this lack of resources it is necessary for them to identify and adapt the resources that already exist and tailor them to the environment, as opposed to creating original materials. As a result of these rigid conditions, models are usually used as a basic roadmap to guide teachers in their planning. Interestingly, many teachers choose not to follow any ID model for fear that it dehumanizes instruction. Teachers may also view the process depicted in many ID models as mechanistic and resulting in dehumanized instruction. There are several widely accepted classroom-oriented models (Gustafson & Branch, 2002).

The Gerlach and Ely model (1980 places importance on the content to be taught in the classroom. The Newby, Stepich, Lehman and Russell model (2000); also known as the PIE model, is written primarily for pre-service teachers. The Morrison, Ross and Kemp (2001) model focuses on curriculum planning. The Heinich, Molenda, Russell and Smaldino Model (1999), the ASSURE model, is very important for classroom application.
The ASSURE model is the most widely accepted model within collegiate textbooks on instructional media (Gustafson & Branch, 2002). Most ID models are represented in a graphical context. The ASSURE model like the ADDIE model is represented in acronym form (Heinich, Molenda, Russell & Smaldino, 1999):

A – analyze learners
S – state objectives
S – select media and materials
U – utilize media and materials
R – require learner participation
E – evaluate and revise

*Analyze learners* is a step that is very important to the production of effective instruction. The ASSURE model suggests that users examine general characteristics. Examples include grade, age, ethnic group, sex, mental, emotional, physical, or social problems, and socioeconomic level. It also suggests that specific entry competencies are investigated, i.e. prior knowledge, skills, and attitudes. Finally, the ASSURE model recognizes the importance of understanding the students' learning styles whether they are verbal, logical, visual, musical, etc (Clark, 2004). This step is comparative to the third step within Gagné’s Nine Step *Derivation to Instructional Design*, understanding entry behaviors and learner characteristics.

When *stating objectives*, the ASSURE model “emphasizes the need to state the desired outcomes of instruction in specific and measurable terms” (Gustafson & Branch, p. 22). The ASSURE model’s concept includes developing ABCD objectives (p. 23). This is the format of writing complete objectives by representing the audience (A), behaviors (B), conditions (C), and degree (D). An example of an ABCD objective would be; graduate students (audience) will be
able to name (behavior) 100% (degree) of Gagné's Derivation of Instructional System when
given a multiple-choice test (condition).

The second s of ASSURE is for selection of media and materials. Because this model is
oriented to the classroom environment, it considers the fact that most teachers do not have the
time and resources to develop original materials (Gustafson & Branch, 2002). This process also
includes the selection of the instructional method. The user would select the media that is most
appropriate for their learning objectives. Media and materials chosen would be that which best
support the instructional method.

After the selection of media and materials, instructional designers/teachers need to plan
for the utilization of the materials and media selected. “Make sure that your instructional
materials are suitable and working the best you can and then use it in the classroom” (The
University of North Carolina at Ashville, n.d., p. 5). The fourth step, require learner
participation, reflects the importance of keeping learners actively involved. Heinich, Molenda,
Russell, and Smaldino believe that learner participation is of primary importance. A respected
advocate of active learning, Dr. R.M. Felder (2006) suggests in his website the following:

Active learning in which students solve problems, answer questions, formulate
questions of their own, discuss, explain, debate, or brainstorm during class, and
cooperative learning, in which students work in teams on problems and projects
under conditions that assure both positive interdependence and individual
accountability. This conclusion applies whether the assessment measure is short-
term mastery, long-term retention, or depth of understanding of course material,
acquisition of critical thinking or creative problem-solving skills, formation of
positive attitudes toward the subject being taught, or level of confidence in knowledge or skills. (p. 1)

Finally, the last step is evaluation and revision. This is the cyclical process found in most ID models. This is the process of reviewing all of the steps chosen and the instruction that was produced and delivered and then revising the process based on the discrepancy between what was anticipated and the actual result of the instruction. This continues the journey to realize the best instruction for the intended audience.

Product-Oriented Models

Unlike Gagné's Derivation of Instructional Systems model (Gagné & Briggs, 1988) often times the front-end (needs) analysis has already been conducted, as is reflected in many product-oriented instructional design models. In these situations the needs analysis is completed for the creation of many different products. Therefore, product-oriented models focus more on the development of a product than on the users' needs (Gustafson & Branch, 2002). When examining product oriented models Gustafson and Branch (2002) define them using four basic assumptions:

1. the instructional product is needed
2. something needs to be produced rather than selected or modified from existing materials
3. there will be considerable emphasis on tryout and revision
4. the product must be usable by learners with only 'managers' or facilitators. (p. 30)

Product development is used for different types of vocational training, and the rapidly growing distance education environment. Like all ID models, product-oriented models can be used in any environment where a model is needed. However, it is necessary to understand that there is a
lack of a detailed needs analysis and requires a more extensive tryout and revision period. The end product often goes into mass production or immediate use, therefore, appearance and usability is crucial (Gustafson & Branch, 2002). Within Survey of Instructional Design Systems, Gustafson and Branch discuss several product-oriented models.

The Gustafson and Branch discuss several models in their text; Bergmand and Moore (1990) product-oriented model was developed specifically to aid in the production of interactive multimedia products. The de Hoog, de Jong and de Vries model (1994) is geared to the development of expert systems and simulations. The Bates model (1995) “presents a model for developing open and distance learning” (Gustafson & Branch, 2002, p. 37). The Seels and Glasgow model (1998) is geared toward practitioners. This model assumes that design and development of a project takes place within the context of project management (Gustafson & Branch, 2002). This de-emphasizes the front–end analysis (needs assessment). Lastly, Gustafson and Branch discuss the Nieveen Model.

The Nieveen Model (Nieveen, 1997) has been used for the creation of lesson materials and courses for distribution within schools. Nieveen produced multiple versions of a “computer-based electronic performance support system (EPSS)” (Gustafson & Branch, p. 39); this is an ID system reflective of these developments. The EPSS was made known in 1991 by Gloria Grey. Grey, quoted by Dickelman (2004), describes EPSS as:

An integrated electronic environment that is available to and easily accessible by each employee and is structured to provide immediate, individualized on-line access to the full range of information, software, guidance, advice and assistance, data, images, tools, and assessment and monitoring systems to permit job performance with minimal support and intervention by others. (p. 1)
Although the Nieveen Model (1997) is consistent with the steps in the generic ADDIE model, it is reflective of Nieveen’s extended work with EPSS. This is evident in the extensive use of formative evaluation within the model. "Nieveen’s model is driven by extensive use of formative evaluation of successive versions of the design documents and then of the actual curriculum materials until a satisfactory level of quality has been achieved" (Gustafson & Branch, 2002, p. 39). Nieveen defines quality curriculum materials as valid, practical, and effective.

**Systems-Oriented Models**

Systems-oriented models are of a larger scale than classroom and product-oriented models: they are usually developed for the planning of large amounts of instruction. Gustafson and Branch (2002) state:

> Systems-oriented models typically assume that a large amount of instruction, such as an entire course or entire curriculum, will be developed with substantial resources being made available to a team of highly trained developers. (p. 45)

Many of the system models begin with data collection, because a great deal of information is needed to produce an entire course or curriculum. Often there is the development of original materials that are used for the delivery of the end design. Gustafson and Branch selected six system models to discuss.

The Interservice Procedures for Instructional Systems Development, or the IPISD model, was created by the military for a more comprehensive instructional development methodology within the military (Gustafson & Branch, 2002). The Gentry Model (1994), entitled the Instructional Project Development and Management (IPDM) model, is intended for graduate students, practicing instructional developers, and teachers. The IPDM model focuses on "what needs to be done and how something is done during an instructional development project"
“(Gustafson & Branch, p. 49). This is done by Gentry’s inclusion of techniques and job aids that facilitate the instructional development.

The Diamond Model as cited in Gustafson and Branch (2002); which like the IPDM model is geared towards higher education institutions, is also discussed. This is considered a politically correct model. Diamond’s model “emphasizes the need to be sensitive to political and social issues existing on the campus and within academic departments” (Gustafson & Branch, 2002, p. 56). The Smith and Ragen Model (1999) is a popular model within the field of instructional technology. Here the creators place particular interest on the intellectual reasoning.

The Dick, Carey, and Carey model (2001) is the most popular model of the system-oriented models. “The Dick, Carey and Carey model has become the standard to which all other ID models are compared” (Gustafson & Branch, 2002, p. 59). This model is often utilized because of the many examples and worksheets it includes in the textbook that lead to the development of specific instructional products.

Finally, Gustafson and Branch (2002) discuss the idea of Rapid Collaborative Prototyping. This is a process that is best utilized by experienced instructional designers who may be able to “anticipate the results of much of the analysis” (Smith & Ragen, 2005, p. 361). Kruse defines a rapid prototype as “… simply a quickly assembled module that can be tested with the student audience early in the ISD process” (2004, p. 1). Therefore, the idea of rapid collaborative prototyping involves the concentration of one unit of instruction completed and improved upon and then the creation of the next unit. This allows for the expedient completion of portions of the instruction for delivery. Instructional designers should have a working knowledge of several models, within each category; whether instruction is intended for individual classroom instruction (classroom) or the end result is a product to be used by others
(product) or if the model is used by an organization to solve problems or achieve goals (system) (Gustafson & Branch, 2002).
CONCLUSION AND RECOMMENDATIONS

The purpose of this literature review was to develop a basic understanding of how adults learn and then an understanding of instructional design models. From these two understandings instructional developers are better equipped to successfully choose an appropriate instructional design model for adult educational purposes.

The Adult Learner

Research and writings from Malcolm Knowles (1977) found that adults are self-directed learners. They choose the intensity of participation and whether or not learning occurs. The literature confirms (Merriam & Cafferella, 1999) that adults are participative decision makers, which again alludes to their self-directiveness. The authors all discussed the importance of past experiences for adults and the importance those experiences have on their learning.

Knowles (1977) states that past experiences are important in order for adults to understand the ideas presented. Merriam and Cafferella (1999) confirmed the idea that past experiences help adults connect to what they are learning.

Finally, Draves (1984) discussed his four main unique learner characteristics. Emotional, physical, social and mental aspects are the components of all students' characteristics. Adults are more in tune to these characteristics, therefore more affected by a negative or positive change in one of these areas. Because of these characteristics, adult educators have the potential to be good communicators and listeners. Educators should remain open-minded and allow adults to pursue their own interests.

Instructional Design

How can we use instructional design models as a tool for designing effective instruction? Johnson stated, "the common goal of education and training is the development of human
potential” (1989, p. 4). The development of human potential is why it is important to understand the characteristics of learners as well as be able to identify the strengths and weaknesses of the educator. After discussing the attributes of the adult learner we can better tailor instruction to them.

Gagné and Briggs (1988) developed the **Derivation of An Instructional System**. This nine-step process is a well-defined description of the general process of an instructional design system. **ADDIE** is the simplified general instructional design model that almost all other instructional design models replicate. Although there are innumerable instructional design models in existence, Gustafson and Branch (2002) provide an overview of the most popular and well-known models. They created a taxonomy for these models consisting of three different categories. Classroom-oriented models are ideally used in classrooms, with consideration to lack of teacher time and resources. Product-oriented models use a multitude of resources and usually ends with a particular product. Lastly, the system-oriented models are much larger and the most complex, and usually result in mass instruction, e.g. an entire course or curriculum. However, with so many models, and different experiences and characteristics of adults, how can we design effective instruction? What makes instruction effective?

**Designing Effective Instruction**

Goodwin and Kincaid (1998) defined effective instruction as “the actual production of an intended or desired outcome or result” (p. 2). To these authors, effectiveness of instruction is in the implementation. Until the product is implemented, no one will learn. Goodwin and Kincaid state that instructional designers often jump into production without considering essential elements that are needed to produce effective instruction. These essential elements are the product, the stakeholders, and the setting.
Goodwin and Kincaid (1998) express that there is a need for quality products. “Designers satisfy this standard by demonstrating credibility striving for the ‘ideal’ instruction, producing the promised deliverables, delivering instruction on time and within budget, and conducting formative and summative evaluations” (p. 4). They also state that many instructional designers underestimate the role of the stakeholder in the effectiveness of the final product. By rallying support from stakeholders, early in the design of a product, instructional designers make themselves aware of what the stakeholders would like. If leaders are not comfortable with the product it will be doomed as fully ineffective, from its’ lack of implementation.

Finally Goodwin and Kincaid (1998) discuss the importance of the environment or setting. Things like social, political, or technical conditions should be investigated for instruction to be effective. In the classroom setting teachers should be “sensitive to limited budget and teachers’ scheduling issues, [if not] instruction will be ineffective because it will not be used” (p. 5). In the adult learning environment considerations need to be made for individual technology levels, what knowledge students already possess, as well as, past experiences and comfort within the classroom environment. They also affirm “Professionals must investigate the culture and economics of the setting if they are going to be successful” (p. 5).

Reiser and Dick (1996) define effective instruction by performance and affective measurements. Effective instruction is determined by “what the students are able to do and how they feel as a result of the instruction they received” (p. 3). What instructional designers need to understand about this process is that it is not rigid and the models or procedures can and should be adapted to the learning situation.
Recommendations

Based on the literature, I suggest the best way for instructors to approach the design of adult instruction is with flexibility and adaptability. The first issue addressed within this literature review was to determine how adults learn. Based on the literature, it was determined that adults learn best in an environment where they are physically comfortable, that also provides a positive emotional climate. Adult learners are self-motivated and ready to learn; therefore instruction should be designed around what they already know and what they desire to learn. In order to achieve these things instruction should be designed to include feedback from adults, throughout its course.

It is necessary for instructional designers to design models that have the simplicity of the ASSURE model, with the examples and charts of the Dick, Carey, and Carey model. Importance should be placed on learner assessment. Current models discuss analyzing the learner in terms of observable behavior. However, a simple pre-assessment before instruction begins, considering learners’ four characteristics (emotional, physical, social, and mental), is recommended. These four characteristics are considered keys to successful learning for adults. The levels that students are at, according to these traits, are crucial to know in order to design effective instruction.

This pre-assessment would be invaluable in tailoring instruction as well as guiding students through a course. Being self-motivated, the time spent to generate motivation within adults could be used to discover the comfort level, as well as what kind of experiences the student is anchoring the instruction. The experience that the instruction is compared to, helps to clarify how and where the learner is in terms of understanding the instruction.

The development of a Model of Adaptability and Flexibility would be ideal for the adult learner. This model would have a general layout of the instructional process; however the
students would actually design the course. Because adults have a readiness to learn, an instructor could ask questions and through student answers design the course. Adults are capable of stating the objectives that they feel are important in the class. Once this is done the instructor tailors the pre-planned instruction to these expectations. It would be beneficial and interesting to see how adults would learn in this hands-on environment.

By reviewing how the adult learner acquires knowledge most effectively and the basic principles of instructional design, I was able to understand the models discussed by Gustafson and Branch (2002), with the adult learner’s needs identified. It is difficult to determine how useful these models would be in the adult classroom, because none of them are specific to the adult learner. The final key is the fact that there must be a discovery process; the instructional designer must take the time to understand the characteristics of the learners and the environment in which the learning process exists.

To answer the original general question: How does the nontraditional student align with nontraditional instruction? The answer is: it is not up to the nontraditional student to align with instruction. When instruction is planned, it is up to the instructional designer to have the ability to provide flexibility within the model and the classroom materials. Then in order for the adult to receive maximum attainment of knowledge, it is primarily up to the learner and their readiness to accept the material for learning.
REFERENCES


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