

PA Literacy Corps

Theory to Practice:

Adult Teaching & Learning Strategies

For Tutors



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INTRODUCTION



A good theory is based on information gained from research and practice. A good practice is based on research findings and carefully crafted theory. They are interdependent.

Theories

A **theory** is a well-substantiated explanation of a set of related observations or events based upon proven hypotheses and verified multiple times by detached groups of researchers.

- A theory is complex and dynamic, and explains a whole series of related phenomena.
- A theory is accepted to be true by the professional community as a whole, and is used to make predictions of events.
- A theory not only explains known facts, it also allows predictions of what should be observed if it is true.
- Theories can be tested—new evidence should be compatible with a theory. If it isn't, the theory needs to be refined or rejected.
- The longer the central elements of a theory hold, the more observations it predicts, the more tests it passes, and the more facts it explains—the stronger the theory.

Principles

According to *Webster's New World Dictionary of the American Language*, a **principle** is a fundamental truth, law, doctrine, or motivating force upon which others are based.

- Principles are overwhelming or obvious ideas that are often accepted as a matter of fact or faith.
- Principles are considered an essential element or constituent of a process.
- Principles are key characteristics that separate one approach from other approaches.

Strategies

A **strategy** is the answer to the question, “*How?*”

- Strategies are actions that enable an organization or individual to achieve results.
- Programmatic strategies address how to develop, manage and deliver programs.

Don't overwhelm tutors with the large number of theories or the details of each. Instead, help them see the main elements of each and the commonalities among them, which are the basis for adult learning principles.

TEACHING AND LEARNING THEORIES

Effective Tutoring Strategies Are Based On Principles Derived From Research-Based Learning Theories

The following brief descriptions of theories represent only a sample of the total number of learning theories that have been developed by education researchers. Some of the theories are the result of research on children, but have relevance for adult learners, as well. Many share common elements, with slightly different areas of focus. All in all, they provide guidance for effective adult education practices, and, in particular, tutoring practices.

Behaviorist Theories

Behaviorists look at learning in terms of observable behaviors, rather than as internal thinking processes. They believe that the environment shapes learning and behavior, and that learning is an association built between two events that occur simultaneously. In other words, learning takes place because of the consequences of a behavior; consequences can be pleasant or positive, the removal of something unpleasant, or both. Behaviorists look for change in behavior that is prompted by stimuli in the external environment, and they see the educator's role as one who arranges the environment to elicit desired responses. A behaviorist orientation to adult education includes behavioral objectives, competency-based education, and skill development training. Well-known behaviorist include E. Thorndike and B.F. Skinner.

Connectionism Theory (E. Thorndike)

E. Thorndike's *Connectionism Theory* proposes that learning is the result of associations forming between stimuli and their responses. The kind and frequency of stimulus-response occurrences either strengthen or weaken these associations or *habits*. According to connectionists, the transfer of learning depends on the presence of identical elements in the original and new learning situations—transfer is always specific, never general.

Operant Conditioning Theory (B.F. Skinner)

Skinner's *Operant Conditioning Theory* proposes that individuals daily encounter reinforcing stimuli that increase or decrease the likelihood of a particular behavior re-occurring. Each behavior is followed by a consequence, and the nature of the consequence has an impact on whether or not that behavior is repeated in the future. Positive consequences encourage repeat behavior. Reinforcement, such as praise or a good grade, strengthens the desired response. On the other hand, removal of positive consequences, or the addition of negative consequences, decreases the likelihood of a behavior being repeated.

Humanist Theories

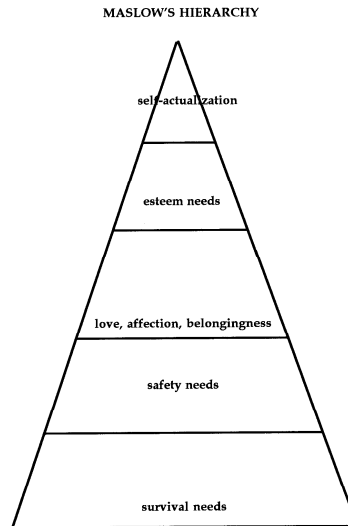
Humanists see the potential for individual learner growth, and believe that affective (emotional) functioning can result in learning. They believe that that motivation, choice, and responsibility are what influence learning, as such individuals determine their own learning—they reject behaviorists' belief that environmental factors determine learning.

According to humanists, life experiences initiate learning, and learning results from an individual's attempt to meet a perceived need or to reach one's potential. These theories propose that learning is generated by emotional and cognitive needs, and that students want to learn to become self-actualized and autonomous. The adult educator's role is to facilitate development of the whole person. Humanist-based theories include

the studies of andragogy and self-directed learning. Prominent humanists theorists include A. Maslow, M. Knowles, C. Rogers, and K. P. Cross.

Abraham Maslow's Hierarchy of Needs

Maslow's *Hierarchy of Needs* was developed in the late 1960s, based on his theory that people are able to move from lower levels of needs to higher levels, provided they are given an education that promotes growth. Lower levels of needs must be at least partially satisfied before higher levels can be attained.



Maslow's hierarchy, from the lowest to the highest level of the pyramid, describes the following needs:

- *Physiological (survival) needs* include the need for oxygen, water, food, rest, and sleep. These needs must be met before people can begin to address higher-level needs in their lives.
- *Safety and security needs* include safe circumstances and surroundings, stability, and protection. They also include a need for structure, order, and some limits or boundaries.
- *Love and belonging needs* include the need for affectionate relationships and a sense of belonging and community. When these needs are not met, people experience loneliness and social anxieties that can become barriers to meeting higher-level needs.
- *Esteem needs* include the need for respect from others, status, fame, glory, recognition, attention, reputation, appreciation, dignity, and dominance. This level also involves the need for self-respect and includes feelings of confidence, competence, achievement, mastery, independence, and freedom. If these needs are not met, people are immobilized by low self-esteem and little or no self-confidence.
- The highest level, *self-actualization*, is reached when people become fully functional and are able to think and act independently.

Maslow describes another set of basic human needs that do not appear in the hierarchy, but provide some additional insights into adult learning. These include the need to:

- Know and understand.
- Analyze or reduce things to their most basic elements.
- Experiment to see what will happen.
- Explain.
- Construct a personal theory that makes sense of events in one's world.

Actualizing Tendency (Carl Rogers)

Rogers' theory is built on a single *force of life* that he calls the *actualizing tendency*; the actualizing tendency is the built-in motivation present in every life form (not just humans) to develop its potential to the fullest extent possible. According to Rogers:

- Individuals instinctively value *positive regard*, which includes love, affection, attention, and nurturance.
- Individuals value *positive self-regard*, which includes self-esteem, self-worth, and a positive self-image.
- Society can lead individuals astray with *conditions of worth*. As children grow up, parents, teachers, peers, the media, and others, only give them what they need, when they show they are *worthy*, not just because they need it.
- Individuals need *positive regard*, so they mold themselves according to societal influences (*conditional positive regard*), which may or may not be in their best interest. Over time, this *conditioning* results in them liking themselves only if they have met the standards others have applied to them, as opposed to when they have truly actualized their potential. And since these standards were created without keeping each individual in mind, adults may find they are unable to meet them, which lowers their self-esteem.
- An *ideal self* is not real and is something that is always out of reach—a standard that can't be met. This gap between the real self and the ideal self, the *I am* vs. the *I should* is called *incongruity*. The greater the gap, the more incongruity; the more incongruity, the more anxiety.

As such, the fully-functioning person:

- Is open to experience and able to accept reality, including one's own real feelings.
- Lives in the present—remembering and learning from the past, and planning or thinking about the future.
- Trusts one's self to do what feels right, and what comes natural.
- Acknowledges the feeling of freedom, and takes responsibility for their own choices.
- Contributes to the actualization of others through creativity in the arts or sciences, through social concern and love, or simply by doing the best job possible.

Andragogy - Malcolm Knowles

Knowles, often referred to as the *father of adult education*, is best known for further developing the concept of *andragogy* in the late 1960s. His work helped professionalize the field of adult education and distinguished it from other areas of education.

The five assumptions underlying andragogy describe the adult learner as someone who: (1) has an independent self-concept and who can direct his or her own learning, (2) has accumulated a reservoir of rich life experiences that is a rich resource for learning, (3) has learning needs closely related to changing social roles, (4) is problem centered and interested in immediate application of knowledge, and (5) is motivated to learn by internal, not external factors (Merriam, 2001).

The term *andragogy* was originally coined in 1833 by a German teacher, Alexander Kapp, to describe elements of Plato's education theory.

Kapp's use of the term *andragogy*, did not become popular at the time, but it reappeared in 1921 and eventually became popular in North America and Britain in the 1960s as a way of describing adult learning through the work of Malcolm Knowles.

Imel (1989) explains the underlying principles, which include: (1) adults are self-directed, (2) adults have many life experiences to contribute to the learning process, (3) adults are problem centered, and (4) adults are motivated by internal factors to learn. Lewis (1997) adds the desire, on the part of the adult learner, for a collaborative educational climate and a trusting and respectful relationship between educator and student.

It has been argued that andragogy is not really a theory, but rather a model. It has also been argued that the assumptions underlying the theory are not strictly adult oriented. In fact, Imel (1989) points out that Knowles modified his educational theory in later years, claiming that many of the learning characteristics he attributed specifically to adults are noticeable characteristics in all human beings. Yet, he still maintained that adults should be educated using techniques different from those used for teaching children.

Lifelong Learning Theory (K.P. Cross)

Cross's *Lifelong Learning Theory* incorporates four principle-based strategies of adult learning:

1. Incorporate the experience of the learner.
2. Adapt to the age limitations of the learner.
3. Challenge the learner to advance to more difficult stages of personal development.
4. Offer a variety of availability and organization of learning programs (Galicia-Castillo, 2004).

Cross integrated the theories of Knowles and Rogers in her *Characteristics of Adults as Learners (CAL)* model. In relation to her theory of adults as lifelong learners, Cross's model assumes that the critical foundation of successfully teaching adults is to gain an understanding of adult characteristics and to apply those qualities to adult education.

The CAL model compares two variables: personal characteristics and situational characteristics—one variable is directly affected by the other variable.

- Personal characteristics include aging, life phases, and developmental stages that can have an impact on learning abilities (for example: prior knowledge, educational attainment level, family situations, attitudes, reasoning, and physical impairments).
- Situational characteristics pertain to participation in adult education in terms of the administration of learning opportunities, such as class schedules, procedures, and location.

Principles of the CAL model include:

- Adult learning programs should capitalize on participants' experiences.
- Adult learning programs should be adaptable to participants' aging limitations.
- Adults should be encouraged and challenged to move to increasingly advanced stages of individual development.
- Adults should be allowed choice in the availability and organization of learning opportunities.

Adult educators, according to this model, must develop their roles as synthesizers and adapters of a broad body of knowledge. Critics of the CAL model claim that Cross has identified too many variables, which reduces the practicality of utilizing the model to any great extent in the creation of adult education programs.

Informal/Popular Education (Paulo Freire)

Freire, a Brazilian educator, developed his theory of education as a result of his literacy work in South America and Africa. According to Freire, all learning is relational and interaction among individuals results in knowledge. Freire believes that learning is also a shared experience between learner and teacher. He is opposed to *banking* education, which is typically a lecture setting where the teacher presents a fixed curriculum to the learner. Instead, he emphasizes respectful dialogue between teacher and learner.

A fundamental aspect of Freire's theory is the idea of developing consciousness, *conscientization*, which has the power to transform not only an individual's reality, but society's as well. Ultimately, according to Freire, knowledge can be utilized to eradicate political and social injustices in working toward a more egalitarian society.

Self-Directed Learning Theory (Cyril Houle)

Houle developed the *Self-directed Learning Theory* (SDL) in the 1960s. According to the SDL, the more mature individuals are, the more likely they are to take control of their own learning.

SDL has three major goals: (1) to develop the learner’s ability to be self-directed, (2) to foster transformational learning, and (3) to promote emancipatory learning and social action (Merriam, 2001). It is seen by some researchers as “a trial-and-error activity, with many loops and curves” (Caffarella, 2000 p. 57).

SDL applies to learning that occurs informally everyday without the interaction of an instructor, as well as formal classroom learning. It has encouraged the use of learner contracts and individualized learning plans (Caffarella, 2000).

Cognitive Science Learning Theories

Cognitive science research focuses on the processes that occur inside the brain and nervous system as a person learns. Cognitive-based learning theories build on the idea that people actively process information and that learning takes place through the efforts of the learner.

According to cognitive theorists, the educator’s role is to structure content in a way that develops students’ learning capacities and skills. In particular, educators help students (1) develop and improve mental processes (information processing), such as inputting, organizing, storing, and retrieving information; (2) find relationships between information; and (3) link new information to prior knowledge. Prominent cognitive theorists include Koffka, Kohler, Lewin, Piaget, Ausubel, Gagne, and Bruner.

Field Theory (Kurt Lewin)

Lewin’s *Field Theory* proposes that behavior is determined by the totality of an individual’s situation. Lewin believes that individuals behave differently according to the way in which they deal with tensions between their perceptions of themselves and of their environment. He feels the whole psychological *lifespace*, within which people exist, has to be viewed in order to understand behavior—these lifespaces, including the family, work, school, and church, are created under the influence of various forces.

Lewin’s work has had a profound impact on what is known about group dynamics and training practice. He borrowed the term *feedback* from electrical engineering and applied it to the behavioral sciences. He also pioneered cognitive aids, such as instructional models of concepts and instructional handouts describing ideas. One well-known cognitive aid that evolved from Lewin’s work is the *Johari Window* (below) created by Joseph Luft and Harry Ingram (Johari) in 1955 to help people better understand their interpersonal relationships and communications.

	Known to Self	Not Known to Self
Known to Others	Open	Blind
Not Known to Others	Hidden	Unknown

Open: things that both I know about myself, and that you know about me.

Blind: things that you know about me, but that I am unaware of.

Hidden: things that I know about myself, that you do not know.

Unknown: things that neither I know about myself, nor you know about me.

Lewin is also generally credited as the person who coined the term *action research*, which is defined as the research needed for social practice—that is, research leading to social action. According to Lewin, research that produces nothing but books will not suffice. His approach involves a spiral of steps, each of which is composed of a circle of planning, action, and fact-finding about the result of the action.

The consistent theme in all Lewin’s work, according to David A. Kolb (1984) was his concern for the integration of theory and practice. This was symbolized in his best-known quotation: “There is nothing so practical as a good theory.”

Conditions of Learning (Robert Gagne)

Gagne identifies five major categories of learning: (1) verbal information, (2) intellectual skills, (3) cognitive strategies, (4) motor skills, and (5) attitudes. Different internal and external conditions are necessary for each type of learning.

According to Gagne’s theory, instruction can be analyzed and broken down into component parts, which can then be taught sequentially.

- Gaining attention (reception).
- Informing learners of the objective (expectancy).
- Stimulating recall of prior learning (retrieval).
- Presenting the stimulus (selective perception).
- Providing learning guidance (semantic encoding).
- Eliciting performance (responding).
- Providing feedback (reinforcement).
- Assessing performance (retrieval).
- Enhancing retention and transfer (generalization).

Gagne believes that learning tasks for intellectual skills can be organized in a hierarchy according to complexity: stimulus recognition, response generation, procedure following, use of terminology, discriminations, concept formation, rule application, and problem solving. The purpose of the hierarchy is to identify prerequisites that should be completed to facilitate learning at each level.

Constructivist Theory (Jerome Bruner)

Bruner’s *Constructivist Theory* proposes that learning is an active process in which learners construct new ideas or concepts based on their prior knowledge. According to this theory, the learner selects and transforms information, constructs hypotheses, and makes decisions, relying on a cognitive structure to do so.

Cognitive structure (schema, mental models) provides meaning and organization to experiences and allows the individual to go beyond the information given. Bruner believes that the teacher should encourage students to discover principles by themselves, using an active dialogue. The teacher or tutor must translate information to be learned into a format appropriate to the learner’s level of understanding, and the curriculum should be organized so that students continually build upon what they have already learned.

Contextual Learning Theory

Contextual learning theory is based on cognitive science and is considered a constructivist approach to teaching and learning as it engages learners in constructing their own meaning, based on their own experiences and contexts. It also involves elements of transformative and self-directed learning.

Contextual learning theory proposes that learning only occurs when students process new information in a way that makes sense to them, within their own contexts or frames of reference. Contextual approaches are

learner-centered and application-oriented, with explicit purposes and goals for learning. Contextual learning is effective because it actively involves the learner in the learning process, combines content and context, and uses authentic materials. Learners search for their own meaning using real-life resources to gather information, engage in problem-solving strategies, integrate new knowledge and skills with their prior knowledge, and immediately transfer and, thereby, maximize new knowledge.

Functional Context (Tom Sticht)

Sticht's *Functional Context* proposes that literacy is developed while it is being applied. Sticht emphasizes the importance of making learning relevant to the experience of learners and their lives. He believes that adults possess prior knowledge that can be used to construct meaning from new information, making it possible for them to transform old knowledge into new knowledge and then transfer the new knowledge to uses that are relevant to them. According to Sticht, using authentic materials in learning tasks enhances the transfer of learning from the classroom to the real-life applications.

Sticht believes the role of the adult educators is to help learners see the relationship between what they want to learn, what is being taught, and its real-life application. Teachers and tutors must relate instruction to learners' prior knowledge, and develop meaningful learning activities in which learners can practice newly acquired knowledge in the contexts in which they will use the new knowledge.

Multiple Intelligences Theory (Howard Gardner)

Gardner's *Multiple Intelligences Theory* suggests that there are a number of distinct forms of intelligence that each individual possesses in varying degrees. Gardner proposes eight different ways of knowing (learning styles): visual/spatial; verbal/linguistic; musical; logical-mathematical; body-kinesthetic; intrapersonal (e.g., insight, metacognition); interpersonal (e.g., social skills); and naturalistic intelligences. This theory implies that learning should focus on the particular intelligences of each person, and that different intelligences represent not only different content domains, but also learning modalities.

- *Visual/Spatial Intelligence*: the ability to perceive the visual. These learners tend to think in pictures and need to create vivid mental images to retain information. They enjoy looking at maps, charts, pictures, videos, and movies.
- *Verbal/Linguistic Intelligence*: the ability to use words and language. These learners have highly developed auditory skills and are generally elegant speakers. They think in words, rather than pictures.
- *Logical/Mathematical Intelligence*: the ability to use reason, logic, and numbers. These learners think conceptually in logical and numerical patterns making connections between pieces of information.
- *Bodily/Kinesthetic Intelligence*: the ability to control body movements and handle objects skillfully. These learners express themselves through movement, and have a good sense of balance and eye-hand coordination. Through interacting with the space around them, they are able to remember and process information.
- *Musical/Rhythmic Intelligence*: the ability to produce and appreciate music. These musically inclined learners think in sounds, rhythms, and patterns. They immediately respond to music either appreciating or criticizing what they hear. Many of these learners are extremely sensitive to environmental sounds (e.g. crickets, bells, dripping water).
- *Interpersonal Intelligence*: the ability to relate and understand others. These learners try to see things from other people's point of view in order to understand how they think and feel. They often have an uncanny ability to sense feelings, intentions, and motivations. They are great organizers, although they sometimes resort to manipulation. Generally they try to maintain peace in group settings and encourage cooperation. They use both verbal (speaking) and non-verbal language (eye contact, body language) to open communication channels with others.
- *Intrapersonal Intelligence*: the ability to self-reflect and be aware of one's inner state of being. These learners try to understand their inner feelings, dreams, relationships with others, and strengths and weaknesses.

- *Naturalist Intelligence*: the ability to recognize and classify things found in the environment. These learners have a strong ability to identify and remember the names of plants, minerals, and animals, including rocks and grass and all variety of flora and fauna.

Situated Learning Theory (Jean Lave)

Lave's *Situated Learning Theory* proposes that learning is a function of the activity, context, and culture in which it occurs; in other words, a function of how the learning activity is *situated*. This theory combines two concepts: (1) learning takes place in context and (2) learning occurs in collaboration with others. It emphasizes that "learning is not something that just happens, or is just inside the head, but instead is shaped by the context, culture, and tools in the learning situation" (Hansman, 2001, p. 45).

Social interaction is a critical component of situated learning; learners become involved in *a community of practice*, which shares certain beliefs and behaviors to be acquired. Learners, as novices, move from the edge of this community to its center, with the help of *experts* who teach them; as novices become more active and engaged within the culture, they become what are considered to be the *experts* and, in turn, they teach other novices. Students learn through "modeling, approximating, fading, self-directed learning, and generalizing" (Hansman, p. 47).

Communities of practice develop around things that matter to people. Through cooperative interactions among community members that build trusting relationships, communities develop the ability to undertake larger or more complex activities and projects. Situated learning often applies to less formal educational settings and involves using the surroundings, culture, and societal norms of a community in the learning process.

Transformational Learning Theory (Jack Mezirow)

Mezirow's *Transformative Learning Theory* proposes that learning is a means to change the way people see themselves and their world (Baumgartner, 2001). Transformational learning tasks encourage adults to scrutinize their previously unexamined values, actions, and ideas (Ross-Gordon, 1998). Often, transformational learning is the result of critically reflecting on a problem affecting one's life. Dover (2006) describes transformative learning as an experience that allows the individual to become more critical and reflective, that enhances the development of a perspective that is open to the thoughts of others, and that increases the likelihood that the learner will be less defensive and more open to new learning experiences.

Baumgartner (2001) explains that the process of transformative learning as beginning with a disorienting dilemma. This event can be the result of a personal crisis or a situation that does not fit into the preconceived thought process of the individual (Dover, 2006). This incident forces the individual to critically reflect upon prior assumptions and re-evaluate perceptions. This type of learning process is primarily cognitive, rational, and analytical (Imel, 2001).

The role of the educator, according to Mezirow, is to help students articulate their current views and ideas, and, then, reflect on these views. Mezirow believes that reflection will lead to learners' changing their current views and, eventually, changing their lives. Transformative learning in the educational environment is an active engagement of both learner and educator in the attempt to redefine and expand their belief system in terms of their life existence.

This theory leads to many questions, including:

- The willingness of students to participate in this type of learning.
- The expectation that students will examine and change their views.
- The responsibility of educators to force students to recognize issues (Caffarella, 2000).

Experiential Learning Theory (David Kolb)

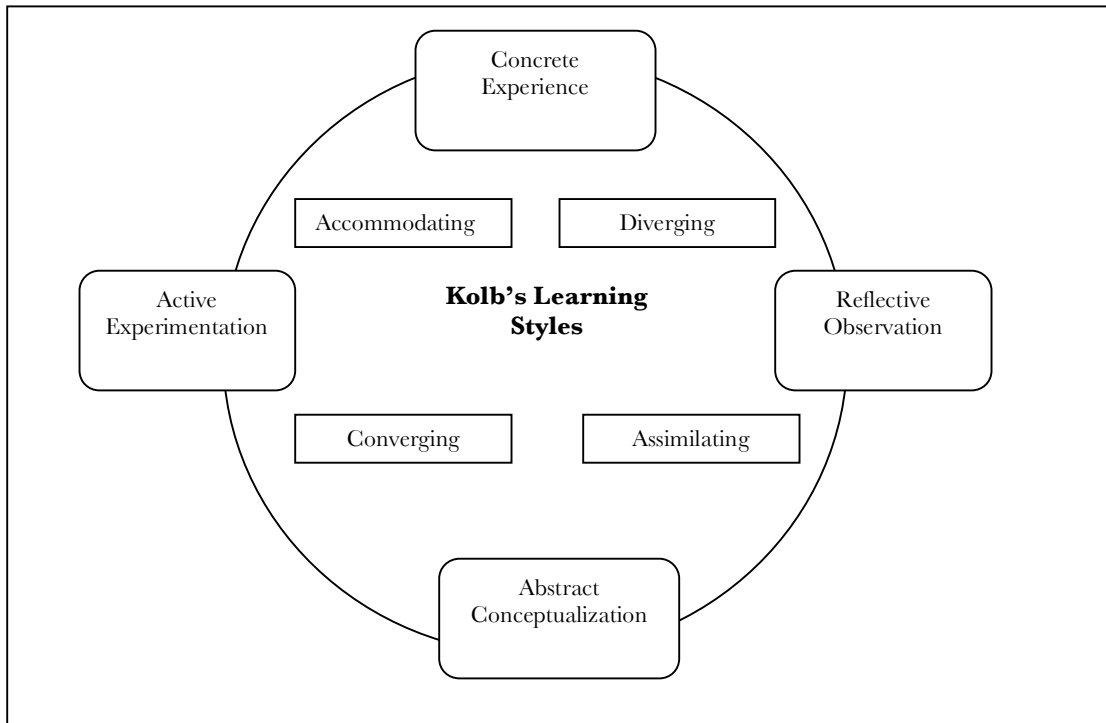
Kolb's *Experiential Learning Theory* identifies four distinct learning styles (or preferences), which are based on a four-stage learning cycle.

Kolb's four learning styles:

- Diverging (CE/RO)
- Assimilating (AC/RO)
- Converging (AC/AE)
- Accommodating (CE/AE)

Kolb's four-stage learning cycle:

- Concrete Experience (CE)
- Reflective Observation (RO)
- Abstract Conceptualization (AC)
- Active Experimentation (AE)



	Active Experimentation (AE) <i>doing</i>	Reflective Observation (RO) <i>watching</i>
Concrete Experience (CE) <i>feeling</i>	Accommodating (CE/AE)	Diverging (CE/RO)
Abstract Conceptualization (AC) <i>thinking</i>	Converging (AC/AE)	Assimilating (AC/RO)

Experiential Learning Theory (Carl Rogers)

Rogers' *Experiential Learning Theory* proposes that learning is a process where learners are actively involved in real-life experiences or simulations, and then explore their feelings through reflection. He makes a distinction between learning from experience and experiential learning—experiential learning is planned, while learning from experience involves the learning that happens informally in everyday life (Miller, 2001).

According to Rogers, the characteristics of experiential learning include: personal involvement, self-initiated, evaluated by learner, and pervasive effects on the learner. Experiential learning connects instruction to learners by providing relevant information, offering an opportunity for practice, and allowing

for adaptation of material learned. Rogers feels that all human beings have a natural propensity to learn—the role of the teacher is to facilitate such learning.

Post-structural Feminist Pedagogy Theory

Post-structural Feminist Pedagogy Theory addresses issues of gender, class, race, and sexual orientation. Four major underlying themes are identified in the literature concerning this theory: (1) the construction of knowledge, (2) voice, (3) authority, and (4) positionality (Tisdell, 1998). Positionality refers to the place that is assigned to an individual based on his or her group membership within the major categories of race, gender, class, age, and sexual orientation (Lee & Johnson-Bailey, 2004).

This theory is built on:

- The constant shifting of identities of participants in order to facilitate individual and social transformation.
- The connections between social identity construction and how knowledge is individually constructed in the politics of knowledge construction.
- The development of *voice* of those who have been marginalized in society.

The instructor's role is assisting adult learners to examine their own unique voices and positionality in conjunction with the educator's constant evaluation of his or her own positionality. Educators must constantly question not only what their positionality has to do with knowledge construction, but also the impact it has on their own teaching around issues of knowledge construction, authority, shifting identity, and dealing with others different from themselves. This theory is based on experiential learning and takes into account the nature of the experience and its relationship to adult learning (Tisdell, 1998).

Social Learning Theory (Albert Bandura)

Bandura's *Social Learning Theory* integrates behavioral and cognitive science theories, and emphasizes the importance of observing and modeling the behaviors, attitudes, and emotional reactions of others. Bandura believes most human behavior is learned observationally through modeling. From observing others, an individual forms an idea of how new behaviors are performed.

Bandura incorporated his findings in a four-step pattern:

1. Attention: the individual notices something in the environment.
2. Retention: the individual remembers what was noticed.
3. Reproduction: the individual produces an action that is a copy of what was noticed.
4. Motivation: the environment delivers a consequence that changes the probability the behavior will occur again (reinforcement or punishment).

According to the theory, learning is stimulated in the relationship between people and environment. Learners participate in learning activities to enable them to fully participate in communities of practice. The educator's role is to facilitate the establishment of communities of practice in which conversation and participation can occur.

Social Development Theory (Lev Vygotsky)

Vygotsky's *Social Development Theory* (1934) proposes that social interaction plays an important role in the learning process. This theory looks at the cognitive development that occurs socially and individually, and attempts to explain consciousness as the end product of socialization. It also describes an aspect of social behavior Vygotsky calls the *zone of proximal development*.

According to Vygotsky, the zone of proximal development is the distance between the *actual developmental* level, as determined by independent problem solving, and the level of *potential development*, as determined through problem solving under guidance or in cooperation with more capable individuals. Learners first develop concepts by talking to others and then solve the problems they face on their own—social interaction enables them to gain knowledge and build their inner resources. Vygotsky emphasizes the role of *shared language* in the development of thought and language.

This theory promotes scaffolding, reciprocal teaching, and communities of learners as techniques for providing guidance to learners.

- Teachers and tutors can help students master a task or a concept by providing support or *scaffolding*. Scaffolding can take many forms, such as templates, checklists, outlines, recommended documents, storyboards, or key questions. These supports are gradually removed as students develop independent learning strategies, thereby promoting their own cognitive, affective, and psychomotor learning skills and knowledge.
- Palincsar (1986) describes the concept of *reciprocal teaching* as an instructional activity that takes place in the form of a dialogue between teachers and students regarding segments of text. The dialogue is structured by the use of four strategies: summarizing, question generating, clarifying, and predicting. The teacher and student take turns assuming the role of teacher in leading this dialogue.

Language Acquisition Theories

Research on language acquisition addresses both first and second language learning—first language learning is most relevant to child development, while second language learning pertains primarily to adult learning, although most general theories of language learning apply to both.

- Linguistic-oriented theories of language learning tend to emphasize genetic mechanisms in explaining language acquisition.
- Behavioral theories argue that association, reinforcement, and imitation are the primary factors in the acquisition of language.
- Cognitive theories suggest that schema, rule structures, and meaning are the distinctive characteristics of language learning.
- Discourse theories argue that interaction with other speakers is the critical dimension in learning language, and that syntactic structures develop from conversations.

Nature vs. Nurture Theories

Traditionally, language acquisition theories have been oriented toward a nature or a nurture perspective. Nature versus nurture debates argue the relative importance of an individual's *innate* qualities (nature) versus *personal experiences* (nurture) in determining or causing individual learning differences. However, it is important to note that nurturists (environmentalists) do not disagree totally with nativist ideas, nor do nativists disagree totally with nurturist ideas.

Nature Theories

Nature theories claim that at least some degree of knowledge is *genetically transmitted and innate*, and is not acquired through interaction with the environment. These nativist theories assert that much of the capacity for language learning is determined by the genetic makeup of human beings and is nearly independent of any particular experience which may occur after birth. Nativists do not deny the importance of environmental stimuli, but they believe that language acquisition cannot be accounted for on the basis of environmental factors only—there must be some innate guide to achieve this end.

According to Noam Chomsky, children are born with a hard-wired *language acquisition device* (LAD) in their brains. When exposed to a language, the LAD makes it possible for them to deduce the grammatical principles of a language, because the principles are innate.

Nature Theories

Nurture theories claim that knowledge comes from *experience*—ultimately, from our interaction with the environment through our reasoning or senses. Environmentalist theories of language acquisition believe that experiences are of greater significance to development than innate contributions; yet, they do not completely reject the innate factors.

Universal Grammar Theory

Universal Grammar Theory is based on the idea that there are principles of grammar shared by all languages, and thought to be innate to humans. It attempts to explain language acquisition, in general, not describe specific languages. This theory does not claim that all human languages have the same grammar, or that all humans are programmed with a structure that underlies all expressions of human language. Rather, it proposes a set of rules that would explain how individuals acquire their language(s). This theory can be traced back to Roger Bacon's 13th century observation that all languages are built upon a common grammar; later linguists who have influenced this theory include Noam Chomsky, Edward Sapir and Richard Montague.

Cognitive Theories of Language Acquisition

Cognitive theories emphasize the importance of meaning, knowing, and understanding. Language learners pay attention to any aspect of the language that they are attempting to understand and produce. Then, step-by-step, they become able to use certain parts of their knowledge through experience and practice.

Communicative Theories of Language Acquisition

Some researchers argue that the central human cultural skill is linguistic communication, and that communicative function is the determining factor in producing language structure. They believe that language acquisition is related to general social, cognitive, and symbolic development (Lieven, 1994, 1997).

Discourse Theory

Discourse Theory emphasizes that language development should be viewed within the framework of how the learner discovers the meaning capacity of language by taking part in communication. *Communicative competence* includes knowledge of the grammar and vocabulary, knowledge of rules of speaking, knowledge of how to use and respond to different types of speech acts and social conventions, and knowledge of how to use language appropriately. Discourse theorists believe that language acquisition will successfully take place when language learners know how and when to use the language in various settings and when they have successfully learned various forms of competence such as grammatical competence and pragmatic competence (conversational strategies).

Stephen Krashen's Theory of Second Language Acquisition

Krashen's theory of second language acquisition consists of five main hypotheses:

1. *Acquisition-Learning Hypothesis*: the most fundamental of all the hypotheses in Krashen's theory and the most widely known among linguists and language practitioners. According to Krashen, there are two independent systems of second language performance: the *acquired system* (acquisition) and the *learned system* (learning)—learning is less important than acquisition.
 - The *acquired system* (or acquisition) is the product of a subconscious process very similar to the process children undergo when they acquire their first language. It requires meaningful interaction

- in the target language - natural communication - in which speakers concentrate not in the form of their utterances, but in the communicative act.
- The *learned system* (or learning) is the product of formal instruction and comprises a conscious process, which results in conscious knowledge about the language, such as knowledge of grammar rules.
2. *Monitor Hypothesis*: encapsulates the relationship between acquisition and learning, and defines the role of grammar. According to Krashen, the acquisition system is the utterance initiator, while the learning system performs the role of the monitor or the editor.
 - The monitor acts in a planning, editing, and correcting function when three specific conditions are met: (a) second language learners have sufficient time at their disposal, (b) they focus on form or think about correctness, and (c) they know the rules.
 - The role of the monitor is minor, being used only to correct deviations from normal speech and to give speech a more polished appearance.
 - There is individual variation among language learners with regard to monitor use—learners who monitor all the time (over-users); learners who have not learned or who prefer not to use their conscious knowledge (under-users); and learners who monitor appropriately (optimal users). Lack of self-confidence is frequently related to over monitoring.
 3. *Natural Order Hypothesis*: suggests that the acquisition of grammatical structures follows a natural order, which is predictable. For a given language, some grammatical structures tend to be acquired early, while others are acquired later. This order appears to be independent of learners' age, first language background, and conditions of exposure. Krashen points out that the implication of a natural order is not that a language curriculum should be based on the order of acquisition identified by research. In fact, he rejects grammatical sequencing, when the goal is language acquisition.
 4. *Input Hypothesis*: Krashen's attempt to explain how the learner acquires a second language—this hypothesis is only concerned with acquisition, not learning. According to this hypothesis, learners improve and progress along the natural order when they receive second language input that is one step beyond their current stage of linguistic competence. Since not all learners can be at the same level of linguistic competence at the same time, Krashen suggests that *natural communicative input* is the key to designing a curriculum, ensuring in this way that learners will receive some input that is appropriate for their own current stage of linguistic competence.
 5. *Affective Filter Hypothesis*: embodies Krashen's view that a number of affective variables play a facilitative, but non-causal, role in second language acquisition. These variables include motivation, self-confidence, and anxiety. Krashen claims that learners with high motivation, self-confidence, a good self-image, and a low level of anxiety are better equipped for success in second language acquisition.
 - Low motivation, low self-esteem, and debilitating anxiety can combine to raise the affective filter and form a mental block that prevents comprehensible input from being used for acquisition.
 - On the other hand, positive affect is necessary, but not sufficient on its own, for acquisition to take place.

Critical Period Hypothesis

Linguist Eric Lenneberg (1964) believed that the crucial period of language acquisition ends around the age of 12 years—that if no language is learned before then, it could never be learned in a normal and fully functional sense. A more up-to-date view of the *Critical Period Hypothesis* is held by Robert DeKeyser, who argues that, although there is a critical period, this does not mean that adults cannot learn a second language perfectly, at least on the syntactic level. He talks about the role of *language learning aptitude*, as opposed to the critical period. Language learning aptitude assumes that virtually everybody can learn a language given adequate opportunity, and is thought to be relatively stable throughout an individual's lifetime.

BICS and CALP (Jim Cummins)

Cummins has made a distinction between two types of language: basic interpersonal communications skills (BICS) and cognitive academic language proficiency (CALP). Research has shown that the average student can develop conversational fluency within two to five years, but that developing fluency in more technical, academic language can take from four to seven years depending on many variables such as language proficiency level, age and time of arrival at school, level of academic proficiency in the native language, and the degree of support for achieving academic proficiency (Cummins, 1981, 1996; Hakuta, Butler, & Witt, 2000; Thomas & Collier, 1997).

Cummins has expanded this concept to include two distinct types of communication, depending on the context in which it occurs:

- *Context-embedded* communication provides several communicative supports to the listener (such as gestures or vocal inflections), which help make the information comprehensible.
- *Context-reduced* communication provides few, if any, communicative clues to support understanding.

Cummins also distinguishes between the different cognitive demands that communication can place on the learner:

- *Cognitively undemanding* communication requires a minimal amount of abstract or critical thinking, such as a short conversation with an acquaintance at a grocery store.
- *Cognitively demanding* communication requires a learner to analyze and synthesize information quickly, and contains abstract or specialized concepts, such as an academic content lesson.

Continuum of Learning Concept

The *continuum of learning concept* involves predictable and sequential stages of language development, in which the learner progresses from no knowledge of the new language to a level of competency closely resembling that of a native speaker. Understanding that students are going through a predictable and sequential series of developmental stages helps teachers or tutors predict and accept a student's current stage, while modifying their instruction to encourage progression to the next stage.

Stage I: The Silent/Receptive or Preproduction Stage: This stage can last from 10 hours to 6 months. Students often have up to 500 *receptive* words (words they can understand, but may not be comfortable using) and can understand new words that are made comprehensible to them. This stage often involves a *silent period*, during which students may not speak, but can respond using a variety of strategies including pointing to an object; performing an act; gesturing or nodding; or responding with a simple *yes* or *no*.

Stage II: The Early Production Stage: This stage can last an additional six months after the initial stage. Students have usually developed close to 1,000 receptive/active words—words that they are able to understand and use. During this stage, students can usually speak in one- or two-word phrases, and can demonstrate comprehension of new material by giving short answers to simple yes/no, either/or, or who/what/where questions.

Stage III: The Speech Emergence Stage: This stage can last up to another year. Students have usually developed approximately 3,000 words and can use short phrases and simple sentences to communicate. Students begin to use dialogue and can ask simple questions, such as “Can I go to the restroom?” and are also able to answer simple questions. Students may produce longer sentences, but often with grammatical errors that can interfere with their communication.

Stage IV: The Intermediate Language Proficiency Stage: Intermediate proficiency may take up to another year after speech emergence. Students have typically developed close to 6,000 words and are

beginning to make complex statements, state opinions, ask for clarification, share their thoughts, and speak at greater length.

Stage V: The Advanced Language Proficiency Stage: Gaining advanced proficiency in a second language can typically take from five to seven years. By this stage students have developed some specialized content-area vocabulary and can participate fully in grade-level classroom activities, if given occasional extra support. Students can speak English using grammar and vocabulary comparable to that of same-age native speakers.

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ADULT TEACHING AND LEARNING PRINCIPLES

Irving Lorge (1947) suggested that to reach the adult learner, you have to teach to what adults want. He believed that adults have “wants” in the following four areas:

1. To gain something.
2. To be something.
3. To do something.
4. To save something.

In the 1940s, Eduard Lindeman proposed that adults learn best when they are actively involved in determining what, how, and when they learn.

According to Robert F. Mager (1992), the more you know about participants, the better you can tailor instruction to meet their needs. He provided the following list of key points concerning experience:

- Everyone comes to the learning situation with a lifetime of experience, regardless of age.
- The lifetime experiences of each learner are different from those of others.
- Lifetime experiences also include misconceptions, biases, prejudices, and preferences. In other words, some of what people think they know is actually wrong.
- It is important to recognize that the experience that adults possess is significantly different in quality from that of youths: Few youths have had the experience of being full-time workers, spouses, parents, voting citizens, organizational leaders, or other adult roles. Accordingly, adults have a different perspective on experience: it is their chief source of self-identity.
- To youths, experience is something that happens to them, whereas adults define themselves in terms of their unique experiences.
- An adult's experience is who he or she is. So if an adult's experience is not respected and valued, it cannot be used as a resource for learning. Adults experience this omission as a rejection of their experience and as a rejection of them as persons, which negatively affects learning.

Ten Principles of Learning

1. We learn to do by doing.
2. We learn to do what we do and not something else.
3. Without readiness, learning is inefficient.
4. Without motivation there can be no learning at all.
5. For effective learning, responses must be immediately reinforced.
6. Meaningful content is better learned and longer retained than less meaningful content.
7. To transfer learning, responses should be learned in the way they are going to be used.
8. One's response will vary according to how one perceives the situation.
9. An individual's responses will vary according to the learning atmosphere.
10. One does what one can do given physical inheritance, background, and present acting forces.

Source: <http://honolulu.hawaii.edu/intranet/committees/FacDevCom/guidebk/teachtip/assumpt.htm>

Adult Learning Principles

Adults participate in learning activities when they see the outcomes as relevant and meaningful to their roles as family members, workers, and citizens.

- Adults have a need to know why they should learn something— they must see a reason.
- Adults have to consider it important to acquire the new skill, knowledge, or attitude.
- Adults tend to learn best when what is to be learned is related to a real-life context that they are familiar with or associated with—topics they find compelling.
- Adult learners need to make connections between familiar ideas and new ideas to be acquired, and see how skills relate to real-life contexts.

Adults become ready to learn when they experience a life situation where they need to know something new.

- Adults are motivated to learn by both extrinsic and intrinsic motivations.
- Adults enter into the learning process with a task-centered orientation to learning.
- Adults focus on learning what is most useful to them—they may not be interested in knowledge for its own sake.

Adults look for learning opportunities that reflect real-life challenges that will advance them toward their goals.

- Adults come to education with a purpose in mind (to get a better job, to help their children with their homework, etc.). Learning has to be applicable to their work or other responsibilities to be of value to them.
- Adults learn best if the knowledge, skills, and strategies to be acquired are linked to real-life contexts that either mirror their own circumstances or illustrate a reality that they would like to know—real-life contexts that relate to their goals.

Adults are autonomous and self-directed.

- Adult learning is facilitated when the teacher can give up some control over teaching processes and planning activities and can share these with learners (Brundage & MacKeracher, 1980).
- Adults have a need to be self-directing and decide for themselves what they want to learn.
- Adult learners want to be actively involved in planning and implementing educational activities.
- Adult learners need the opportunity to explore and discuss where they are in their learning, where they would like to be, and what keeps them from getting there.

Adult learners' life experiences and knowledge provide unique and rich teaching resources for educators.

- Adults have a volume of prior knowledge and past experiences that can be connected to new learning experiences and, in so doing, can make learning more meaningful and assist in the acquisition of new knowledge.
- Adult learning is facilitated when learners' representation and interpretation of their own experiences are accepted as valid, acknowledged as an essential aspect influencing change, and respected as a potential resource for learning (Brundage & MacKeracher, 1980).

Trust plays an important role in the development of an environment that is conducive to a positive learning experience.

- Adults will generally learn best in an atmosphere that is nonthreatening and supportive of experimentation and in which different learning styles are recognized (Smith, 1982).
- Educators must establish sound relationships with students by exhibiting the behavioral characteristics of empathy, trust, and congruence. The adult learner needs to feel that the educator understands and appreciates the challenges that are faced by the adult student.
- The educator must be "real" and authentic with the adult student. This behavior will instill a sense of trust between the two individuals.
- The development of language and literacy requires learners to take some risk. To learn, adults must engage in a certain amount of experimentation, and, as a result, mistakes/errors are likely along the way.
- Adult learning is facilitated when teaching activities do not demand finalized, correct answers and closure; express a tolerance for uncertainty, inconsistency, and diversity; and promote both question-asking and -answering, problem-finding and problem-solving (Brundage & MacKeracher, 1980).

Language and literacy are social processes that involve interaction with others.

- Language and literacy improve as learners gain experience in expressing their ideas and communicating with others, and skills get refined through a process of discussion and reflection.
- Learners need the opportunity to process information by talking about ideas and discussing them with others.
- Adults need to see how others, similar to themselves, deal with challenges.
- Adults benefit from working in groups where they learn collaboratively and can be a resource to others.

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LEARNING AND TEACHING STRATEGIES

Adult learners are primarily in charge of their own learning. Remember that it is not your job to implant ideas or to transfer skills directly to the learner—you can only suggest and guide adults in their own learning.

- You are a facilitator and catalyst for adults' learning. Your primary responsibility is to do a good job of managing the process through which adults learn.
- You make it possible for learning to happen by designing and performing all the activities that learning processes require.
- You serve as a model for successful learning.

Create a Positive and Non-threatening Tutoring Environment

You are responsible for creating a positive and non-threatening learning environment that fosters mutual respect and trust, support rather than judgment, and fun. You should exhibit personal traits such as clarity, creativity, humility, openness, patience, energy, and a sense of humor.

Be well organized so that tutoring will start on time, end on time, and provide productive use of time during the tutoring session. Adults are busy and don't want to feel that they have wasted their time during a tutoring session.

Encourage Adults to be Self-Directed Learners

You can help adult learners acquire new knowledge and develop new skills, but you cannot do the learning for them. Although adults may be completely self directing in most aspects of their lives, they may not be in learning situations and may tend to be dependent on you. To reduce learner dependency, you can:

- Guide learners in determining the relevance of learning for their own lives and work.
- Encourage them to use their own judgment and decision-making capabilities.
- Teach learners strategies to help them do problem solving and find their own solutions.
- Provide scaffolding in learning activities to allow adults to gradually become independent learners.
- Build their self-confidence and esteem through regular feedback on their work and well-earned praise.

It is important to recognize that learning is a developmental process.

- Adults who know more about a subject in the beginning may be ready for self-directed learning activities sooner than those who know less.
- Some students develop more quickly than others.
- Adults should be given responsibility for their own learning gradually, as they are ready for it.

Engage Adults in Their Own Learning

Allow adult learners to develop ownership of their learning experiences by involving them in identifying their learning needs and goals, and planning learning activities. Help them develop attainable objectives. As tutoring progresses, you can further engage adult learners by selecting teaching strategies and materials that require their direct involvement.

- Regardless of the teaching strategy, give adult learners the chance to test their ideas, to take risks, and to be creative—this will promote learning.
- Make content of tutoring activities applicable to context of adult learners' lives.
- Design learning experiences that actively involve adults in the instructional process.
- Encourage questions; the point should be made that no question is stupid—the only stupid question is the one that never gets asked.
- Assist students in the process of *transference*, which is the ability to take material learned in the educational setting and use it in an outside setting" (Lieb, 1991).

Build on Adults' Experiences and Prior Knowledge

- Adults bring to tutoring a background of experience and prior knowledge that are a rich resource for teaching new knowledge and skills.
- Expand upon and help learners refine their prior knowledge by connecting it to new learning, making instruction relevant to important issues and tasks in the adults' lives.

Make Learning Relevant and Meaningful

Another way to facilitate learning is to relate material to the student's lifestyle—the more meaningful material is to an adult, the quicker and easier it will be learned.

Adult learners are motivated to learn when they have a need to know. As such, they want to know how tutoring will help them and often ask or think about the following questions:

- What's in it for me?
- Why do I need this information?
- How will I benefit from it?
- How can I make use of it in a practical, real way?
- How will it help me be a better person, parent, worker, or citizen?

Provide relevance by actually using new information and skills to solve problems, or by applying new knowledge through simulations or practice exercises.

Seize Teachable Moments

The key to using adults' "natural" motivation to learn is tapping into their most teachable moments: those points in their lives when they believe they need to learn something new or different (Zemke & Zemke, 1995). Teaching is most effective when it occurs in quick response to a need the learner feels. So, make every effort to teach students when they ask.

There are four critical elements of learning that must be addressed to ensure that adults learn. These elements are:

1. Motivation
2. Reinforcement
3. Retention
4. Transference

Begin with What Is Known (Prior Knowledge)

Learning moves faster when it builds on what adults already know. Teaching that begins by comparing the old, known information or process with the new, unknown information allows the student to grasp new information more quickly.

Move from Simple to Complex

Adult learners will find learning more rewarding if they have the opportunity to master simple concepts first and, then, apply these concepts to more complex ones. Remember, however, that what one student finds simple, another may find complex.

Present Reasonable Challenge

Set an appropriate level of difficulty. Students must feel challenged by the degree of difficulty of the material, but not so challenged that they are frustrated by information overload (Lieb, 1991). Attempt to keep the stress level adjusted at the lowest possible level for the material that is being presented. When the student is too stressed by the material, learning becomes a difficult, if not impossible, task.

Accommodate Preferred Learning Styles

How quickly and well students learn depend not only on their intelligence and prior education, but also on their learning style preference.

- *Visual* learners gain knowledge best by *seeing* or *reading* what you are trying to teach.
- *Auditory* learners gain knowledge best by *listening*.
- *Tactile or psychomotor* learners gain knowledge best by *doing*.

You can enhance learning if you assess your student's preferred learning style, then plan tutoring activities and use teaching tools appropriate to that style. To assess a student's preferred learning style, there are simple assessments (available online) that learners can complete (you might complete one at the same time!), you can simply ask adult learners how they learn best, or you can experiment with different teaching tools, such as printed materials, illustrations, videotapes, and audio equipment.

Help Learners Retain Information

The ability to retain the material is directly proportional to the importance of the material to the learner. It is also the results of the amount of practice that the student has done with the new acquired learning ability. Emphasize the importance of practice both within and outside of tutoring sessions.

The amount of retention will also be directly affected by the degree of original learning. Simply stated, if the participants did not learn the material well initially, they will not retain it well either.

Learning results from stimulation of the senses. In some people, one sense is used more than others to learn or recall information. In order to encourage retention of new information, present materials that stimulate as many senses as possible.

Guide Immediate Application of Knowledge (Transference)

Giving adults the opportunity to apply their new knowledge and skills reinforces learning and builds confidence. It emphasizes the relevance of what they are learning and how tutoring is helping them attain their goals. This immediate application translates learning to the real world and provides an opportunity for problem solving and feedback.

Transference is the ability to use newly learned information in a new setting. It is most likely to occur under the following circumstances:

- Association; when adults can associate the new information with something that they already know.
- Similarity: when the information is similar to material that adults already know.
- Degree of original learning: when adult learners' degree of original learning was high.
- Critical attribute element: when the information learned contains elements that are extremely beneficial (critical) on the job.

Provide Feedback and Reinforce Learning

Adult learners need and respond to reinforcements. According to Sullivan, Wircenski, Arnold, and Sarkees (1990), the need for positive feedback is a characteristic of the adult learner.

Learning is made easier when students are aware of their progress. Positive feedback can motivate them to greater effort because it makes their goal seem attainable. And like most learners, adults prefer to know how their efforts measure up when compared with the objectives of the instructional program.

Ask your students how they feel they are doing. Encourage them to take part in assessing their own progress toward learning goals—their input can guide your feedback. You will find their reactions are usually based on what “feels right.” Remember that adults have a tendency to “vote with their feet”; that is, if they find the program to be a negative experience, they will find some reason to drop out of the program before its completion.

Reward desired learning with praise. Well-earned praise improves the chances that adult learners will retain the material.

- Praising your student's successes associates the desired learning goal with a sense of growing and accepted competence.
- Reassuring them that they have learned the desired material or technique can help them retain and refine it.

Reinforcement should be part of the teaching-learning process and used on a frequent basis, especially early in the process, to help adults retain what they have learned.

- Specific, rather than general, feedback is a necessity.
- Timeliness of feedback is of ultimate importance.

Both positive and negative reinforcements are important teaching strategies. Positive reinforcement is used when teaching new skills—positive reinforcement is “good” and reinforces “good” (or positive) behavior. Negative reinforcement is used when trying to change modes of behavior when teaching new skills or

presenting new information. The result of negative reinforcement is *extinction* -- use negative reinforcement until the “bad” behavior disappears, or it becomes extinct (Lieb, 1991).

Plan for Periodic Rests

Remember that periodic plateaus occur normally in learning. When tutoring activities are especially complex or lengthy, your students may feel overwhelmed and appear unreceptive to your teaching. Be sure to recognize these signs of mental fatigue and let the student relax.

Vella’s (2002) teaching strategies include:

1. Needs assessment.
2. Safety in the process and environment.
3. Sound relationships between learner and teacher as well as among learners.
4. Sequence of content and reinforcement.
5. Praxis: learning by doing (active learning) with reflection.
6. Respect for learners as decision makers.
7. Ideas, feelings, and action—different aspects of learning.
8. Clear roles and role development.
9. Teamwork (learning community).
10. Engagement of learners (active learning).
11. Accountability.
12. Immediacy of learning (feedback, purpose, and goals).

Brookfield’s (1990) teaching strategies include:

1. Be clear about the purpose of your teaching
2. Be reflective on your own learning
3. Expect ambiguity
4. Remember that perfection is impossible (and students really enjoy this!!)
5. Research your students’ backgrounds
6. Attend to how students experience learning
7. Trust your instincts
8. Create diversity
9. Take risks
10. Recognize the emotionality of learning
11. Acknowledge your own personality (let students see you for who you are)
12. Balance support and challenge for the students learning
13. Recognize the significance of your actions
14. View yourself as a helper of learning

Lieb’s (1991) teaching strategies include;

- Allow adult learners ownership of their learning experience.
- Make content of lessons applicable to context of students’ lives.
- Assist students in the process of transference—the ability to take material learned in the educational setting and use it in an outside setting.
- Students must feel challenged by the degree of difficulty of the material but not so challenged that they are frustrated by information overload.

Kelly’s (2003) teaching strategies include:

- The physical environment should include comfortable chairs, good lighting, use of blackboard and overhead so that items can be seen clearly, clear speech, and good acoustics.
- Be well organized so that tutoring will start on time, end on time, and provide productive use of time during the tutoring period. Adults are busy and don’t want to feel that they have wasted their time during a tutoring session.

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METACOGNITION AND SELF-REGULATORY STRATEGIES

Research indicates that metacognition and self-regulation significantly aid student learning at all levels.

- Metacognition is knowing what one knows and doesn't know. It is the ability to self-monitor levels of understanding and predict how well one will perform on a learning task.
- Self-regulation is the ability to monitor one's own comprehension and assess one's own abilities without support.

Metacognition

Metacognition enables successful learning, and has been associated with intelligence (Borkowski, Carr, & Pressley, 1987); however, metacognition strategies can be taught. Metacognition refers to higher-order thinking, which involves active control over the cognitive processes engaged in learning. Metacognition is effective before, during, and after a learning task is performed. The following checklist of questions can serve as a scaffold for students until they automatically ask these questions of themselves.

Metacognition Checklist	
1.	Developing a plan of action <u>before engaging</u> in the task. <ul style="list-style-type: none"><input type="checkbox"/> What does this task require?<input type="checkbox"/> What do I need to complete this task?<input type="checkbox"/> What in my prior knowledge will help me with this particular task?<input type="checkbox"/> What should I do first?<input type="checkbox"/> How much time do I have to complete the task?
2.	Maintaining/monitoring the plan <u>while engaged</u> in the task. <ul style="list-style-type: none"><input type="checkbox"/> How am I doing?<input type="checkbox"/> Am I on the right track?<input type="checkbox"/> How should I proceed?<input type="checkbox"/> What information is important to remember?<input type="checkbox"/> Should I move in a different direction?<input type="checkbox"/> Should I adjust my pace because of the difficulty of the task?<input type="checkbox"/> What do I need to do if I do not understand?
3.	Evaluating the plan and outcomes <u>after performing</u> the task. <ul style="list-style-type: none"><input type="checkbox"/> How well did I do?<input type="checkbox"/> What could I have done differently?<input type="checkbox"/> How might I apply this line of thinking to other problems?<input type="checkbox"/> Do I need to go back through the task to fill in any blanks in my understanding?

Self-regulation Strategies

Self-regulation is an integrated learning process that involves the development of a set of constructive strategies that guides one's learning. These strategies help students rely on their own resources to manage their learning. Although self-regulatory strategies are important for all students and equip them to be lifelong learners, they are particularly important for success in postsecondary education and training, and are very effective with second language learners.

Self-regulatory strategies are an important means of *scaffolding*, and can be taught and improved. Winne (1995) argues that all learners inherently self-regulate, but there are individual differences regarding their knowledge base about self-regulatory learning and their knowledge about when to engage that knowledge and their skills.

Dörnyei and Ottó identify three types of self-regulatory strategies: (1) learning, (2) goal setting, and (3) action maintenance strategies. Corno (1993) refers to these strategies as “mindful effort investments.” Self-regulatory strategies enhance achievement, while helping students understand how and why they study, thereby reinforcing their motivation.

Goal setting is a self-regulatory strategy as it helps students focus, direct, and evaluate their actions toward completion of a learning task. Students must learn that there are different ways to attain goals, and how to select the best way to complete a specific task.

Research reveals that, compared with low-achieving students, high achievers tend to set more specific learning goals, use a variety of learning strategies, self-monitor more often, and adapt their efforts more systematically. However, self-regulatory strategies can be taught to all students, often helping low-achieving students become higher achieving students.

The quality and quantity of self-regulation processes are crucial. One self-regulation strategy will not work for all students, nor will it work optimally for all learning tasks; as such, it is important that students learn to use multiple self-regulatory strategies. They must also learn that their goals and their choice of self-regulation strategies have to be continually adjusted. Learners with high levels of self-regulation have more control over the attainment of their goals than those without.

According to Barry Zimmerman (1989), self-regulated learning involves the management of three general aspects of learning. Self-regulation involves:

1. Active control of the various resources students have available to them, such as their time, their study environment, and their use of others, such as tutors, to help them.
2. Controlling and changing motivational beliefs such as self-efficacy and goal orientation, so that students can adapt to the demands learning. In addition, students can learn how to control their emotions, such as anxiety, in ways that improve their learning.
3. The control of various cognitive strategies for learning, such as the use of deep learning strategies that result in better learning and performance than students demonstrated previously.

Similar to metacognition, there are three stages of self-regulation:

Stage 1. Forethought, which occurs before the task begins and engages students as they:

1. Analyze tasks.
2. Plan actions.
3. Minimize unknowns.
4. Develop a positive attitude and realistic expectations.
5. Set goals for specific outcomes, arranged in order from short-term to long-term.

Stage 2. Performance control, which involves students in specific strategies during learning, and addresses the following questions:

1. Are students accomplishing what they hoped to do?
2. Are they being distracted?
3. Is this taking more time than they thought?
4. Under what conditions do they accomplish the most?
5. What questions do they ask themselves while they are working?
6. How can they encourage themselves to keep working?

Stage 3. Self-reflection, which involves student reflection after the performance of the task.

1. Self-observation—systematically monitoring own performance.
2. A self-evaluation of outcomes compared to goals.
3. Did they accomplish what they planned to do?
4. Were they distracted and how did they get back to work?
5. Did they plan enough time or did they need more time than they thought?
6. Under what conditions did they accomplish the most work?

Self-regulatory attitudes (beliefs), strategies, and practices include:

Positive attitude toward learning and studying	Motivation for success	Diligence, self-discipline, and willingness to work hard.
Task analysis and goal setting	Planning ahead	Use of time management skills for class, tutoring, and studying
Management of anxiety and worry about performance/achievement	Concentration and attention to learning tasks	Sequencing and timing to complete tasks
Information processing, acquiring knowledge, and reasoning.	Organizing and transforming information.	Selecting main ideas and recognizing important/relevant information.
Self-assessment	Analysis of problem solving	Reviewing and preparing for classes and tutoring sessions
Use of support techniques and materials	Test strategies and preparing for tests; practice tests	Rehearsing and memorizing (written or verbal)
Use of mnemonic devices	Active listening	Reflection
Summarizing	Outlining	Highlighting
Rearrangement of materials	Use of pictures, diagrams, charts	Use of webs/mapping
Use of flashcards/ index cards	Using repetition	Note-taking
Making sample questions	Listing/analysis of errors made	Teaching someone else the material

Suggestions for Improving Self-Regulatory Skills (Bogue, 1993)

Attitude	Encourage students to work on higher level goal setting and reassess how education fits into future plans
Motivation	Encourage students to work on goal setting for individual tasks and assignments
Time management	Teach students how to create a schedule and how to deal with distraction, competing goals, and procrastination
Anxiety	Teach techniques for coping with anxiety and reducing worry so students can focus on the task and not on anxiety
Concentration	Teach techniques to enhance concentration and set priorities by focusing attention on the task at hand and eliminating interfering thoughts, emotions, feelings, and situations
Information processing	Teach methods that students can use to help add meaning and organization to what they are trying to learn
Selecting Main Idea	Teach how to identify important information so students can focus attention and information processing strategies on appropriate material
Study Aids	Teach students about the types of study aids provided in educational materials and how they can create their own aids
Self-assessment	Teach students about the importance of self-assessment and specific methods to review instructional material and to monitor their comprehension.
Test Strategies	Teach students how to prepare for tests, the characteristics of different types of tests and test items, and how to reason through to an answer

Surface and Deep Learning

Surface learning and deep learning are two approaches to processing material that is to be learned (Marton & Säljö, 1976; Entwistle, 2000; Atherton, 2002).

- *Surface learning* is passive information processing that lacks reflection, uses low-level metacognitive skills, and is extrinsically motivated. Surface learning may result in good memory for facts and definitions, but a limited ability to understand or use them.
- *Deep learning* is active processing that is intrinsically motivated, reflective, and uses higher-level metacognitive strategies. Deep learning results in the linking of newly acquired facts and definitions into a conceptual framework of existing knowledge.

While students who use surface learning may do well on tests that assess learning through knowledge of facts and definitions, they may not understand or be able to apply the memorized and superficially processed information. On the other hand, students who use deep learning are able to understand, apply, and use information learned.

It is possible for the same student to use both surface and deep approaches when processing new material, depending on: their goals or objectives, their concept of learning, and their insight into their understanding of the information they are trying to learn (Entwistle, 2000).

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ADULT LEARNING PROCESSES

Research tells us that:

People of all ages have the potential to learn, with some able to learn faster than others.

- Age may or may not affect a person's speed of learning.

Individuals vary in way they like to learn and learn best.

- Using varied methods of teaching also helps the learner maintain interest, and may reinforce concepts, without being repetitious.

A new learning situation can cause stress and confusion.

- Some anxiety can increase the motivation to learn, but too much anxiety can cause fatigue, inability to concentrate, resentments, and other barriers to learning.

Adults have expectations, and it is critical to take time early on to clarify and articulate all expectations before getting into content.

Adults bring a great deal of life experience to the tutoring relationship, an invaluable asset to be acknowledged and used.

- Incorporating students' experiences, observations of others, and personal ideas and feelings promote learning.

Adults learn faster when they realize that new concepts are useful in their present, as well as future lives.

Adults prefer learning experiences that are participatory.

- Learning improves when the learner is an active participant in the educational process.
- When selecting among several teaching methods, it is best to choose the method that allows the learner to become most involved.

Adults need to be able to integrate new ideas with their prior knowledge, if they are going to keep and use new information.

- Information that conflicts sharply with what is already held to be true, and, therefore, forces a re-evaluation of the old material, is integrated more slowly.
- Information that has little conceptual overlap with what is already known is acquired slowly.
- Integration of new knowledge and skills requires transition time and focused effort on application.

Adults tend to compensate for being slower in some psychomotor learning tasks by being more accurate and making fewer trial-and-error ventures.

- Adults tend to take errors personally and are more likely to let them affect self-esteem. Therefore, they tend to apply tried-and-true solutions and take fewer risks.

Adults prefer self-directed and self-designed learning projects.

- They often select more than one medium for learning, and they desire to control the pace of and start/stop time for learning.

Fast-paced, complex, or unusual learning tasks interfere with the learning of the concepts or data they are intended to teach or illustrate.

Adult learners are dependent on the teacher or tutor for confirming feedback on skill practice.

The depth of learning increases when new concepts and skills are useful in meeting current needs or problems.

The depth of long-term learning is strengthened when learners try to analyze, clarify, or articulate their experiences to others in their family, workplace, or social groups.

Concentration

Concentration is thinking and active involvement in a task. It is the ability to direct one's thinking in whatever direction an individual intends.

It is essential to provide learning environments that help learners concentrate on their learning tasks. Contents, formats, and sequences must be interesting to compete with other attention-demanding thoughts and environmental intrusions (McLagen, 1978).

Adult learners often need to learn and practice concentration skills and strategies, and may need to expand their concentration span. *Concentration span* is the time learners can concentrate on a specific task before their thoughts wander—learners tend to have a different concentration span for different tasks. Most people find their concentration span for most tasks to be about an hour. However, concentration span varies for some people and for some tasks, from just a few minutes to two or three hours.

Barriers to Concentration

The main barriers to concentrating are boredom, anxiety, and daydreaming—to improve concentration skills, learners need to know how to counteract these barriers. The following strategies can keep a learner on task.

1. Make sure that the environment aids concentration.
2. Each time learners notice their thoughts wandering, they need to say to themselves, STOP, and then bring their attention back to where they want it to be—at first, this could be many times a day, but they will find that the period of time they can concentrate will increase.
3. Learners must train themselves not to give in to distractions—they need to keep focused on what is in front of them. If they become distracted, they need to use the STOP technique to regain their concentration.
4. Learners often become distracted by worries—they need to set aside specific times in the day for worrying. So, whenever an anxiety or distracting thought enters their mind, they need to get rid of it until their next worry time, and re-focus on to what they are supposed to be doing. Some people find it helpful to write down the worry so they won't worry about having forgotten it when they get to their worry time.
5. In between periods of concentration, suggest to learners that they do things to change their physical and mental activity. They could move around to boost their circulation if they have been sitting, or they could think about something completely different to give their brain a new focus.
6. Give learners incentives and rewards appropriate to the level of concentration they have had to maintain.
7. Use a hierarchy of questions to help learners focus when reading.
8. Have learners write brief notes as they read.
9. Have learners do tasks that need the most concentration at times when they are mentally and physically fresh; concentration is harder to maintain when learners are tired.
10. If learners feel overwhelmed, they tend to lose concentration because it all feels impossible. Look for ways of breaking the task up into smaller discreet parts that feel manageable. Then treat them as individual tasks, so learners can concentrate on each of them separately.

Memory Strategies

When I hear, I forget
When I see, I remember
When I do, I understand.
Ancient Chinese saying

Memory and learning are closely connected. Memory is essential to all learning, because it lets students store and retrieve the information that they learn.

Learning depends on memory because the knowledge stored in students' memory provides the framework to which they link new knowledge—the more extensive their framework of existing knowledge, the more easily they can link new knowledge to it.

Encoding is how memories are formed.

Storage is how memories are retained.

Retrieval is how memories are recalled.

Research indicates that, over a period of three days, learning retention is as follows—you remember:

10% of what you read.
20% of what you hear.
30% of what you see.
50% of what you see and hear.
70% of what you say.
90% of what you say as you do
(Pike, 1989).

There are different types of memory:

1. *Sensory memory* takes the information provided by the senses and retains it accurately, but only for a short time (from a few hundred milliseconds to one or two seconds). It is an essential step for storing information in short-term memory.
2. *Short-term memory* temporarily records information, but this information will quickly disappear forever unless learners make a conscious effort to retain it. Short-term memory has a storage capacity of only about seven items and lasts only a few dozen seconds. Just as sensory memory is a necessary step for short-term memory, short-term memory is a necessary step toward the next stage of retention, long-term memory.
 - Long-term memory stores information and has an unlimited capacity that can last for an entire lifetime. Long-term memory sometimes distorts the facts, and tends to become less reliable as learners age.

Recognition and Recall

Recognition is an easier stage of memory than the *recall* stage.

- It is much easier to *recognize* an answer to a question if there are multiple choices than to *recall* the answer without the options listed.
- Long-term memory is necessary to go beyond just recognizing the correct answer.

Helping Adults Learn New Material

1. First, you must make sure that learners understand new material before trying to remember it—they cannot remember what they do not understand.
 - A good technique to ensure learner understanding is to have them recite or write new information in their *own words*. If they can't, then they don't understand.
2. Initial memories are important.
 - Memory depends on forming an original, clear neural trace in the brain.
 - Initial impressions are vitally important because the mind remembers incorrect impressions as easily as it does correct impressions. If adults remember incorrect information, they will have to unlearn and relearn.
3. Evaluating what they are learning can help learners improve retention. Analytical thinking encourages them to consider the matter from various aspects and this kind of mental manipulation makes them more knowledgeable and recall is significantly improved.
 - Have them examine and analyze what they have learned.
 - Have them compare and contrast new information.

The Value of Recitation

Recitation is having learners say aloud the ideas you want them to remember—it is very effective for transferring material from the short-term memory to the long-term memory.

While learners are reading the words in a sentence or paragraph, the short-term memory holds those words in their mind long enough for them to gain the sense of the sentence or paragraph. However, the short memory has a very limited capacity. One reason students can't remember everything in the first part of the chapter by the time they reach the end of the chapter, is because they often read continually without taking a break or taking time to review what they have already read. Students need to recite or consciously think about the ideas conveyed by a sentence or paragraph in order for them to transfer into the long-term memory.

Over-learning

A well-known psychologist and researcher, Ebbinghaus, has reported that each additional recitation (after learners really know the material) engraves the mental trace deeper and deeper. This establishes a base for long-term retention. For many people over-learning is difficult to practice because, by the time they achieve mastery, there is little time left and they are eager to drop the subject and go on to something else. But reciting the material even just one more time significantly increases retention.

Reviewing material at the beginning of a tutoring session is a good way to help students over-learn.

All verbal information goes first into the short-term memory. When it is rehearsed (recited), part of it goes into the long-term memory. The rest of it, usually the part learners are least interested in, returns to the short-term memory and is then forgotten. Whether new information is stored or dumped depends on learners reciting it out loud and on their interest in the information.

After this number of days—	the amount remembered by students who did not review (no recitation)	the amount remembered by students who reviewed (recitation)
7	33%	83%
63	14%	70%

Source: http://www.web-us.com/memory/memory_and_related_learning_prin.htm

Review

Information that goes into the adult learner's memory will likely be remembered if learners practice remembering the information soon after they process it. Therefore, it is important to provide opportunities in the tutoring session for review and remembering by means of activities like written summaries, application exercises, and discussions (Zemke & Zemke, 1995).

Plateaus

According to research, the amount learned per unit of time is small at first, then increases, and then becomes small again. These *plateaus* in learning may be due to several causes such as fatigue, loss of interest, or diminishing returns from using the same inefficient learning methods. Another explanation of plateaus is that they represent *pauses* between stages of understanding; when students acquire a new insight, they can move forward.

Sometimes the lower stage of an understanding or a skill may actually *interfere* with progress to a higher level. For example, learning to read by individual letters of the alphabet interferes with learning to read by words. Learning to read word-by-word delays reading by phrases or sentences.

The important thing is to recognize that plateaus or periods of slow learning are inevitable, and they should not discourage the student. Learning may still be taking place, but at a slower pace.

Memory Rates

The rate at which students learn depend upon their learning ability, but slow learners remember just as well as fast learners, provided that they have learned the material equally well.

- The reason bright students may do better on examinations is that they have learned the subject matter more effectively within the time available.
- But if slower students spend enough time on their studies, they can retain every bit as much as faster students.

- There is evidence that both the rate of learning and the rate of retention can be improved with practice.

Research-based Memory Techniques

1. People tend to remember more of the beginning and end of a learning session.
 - Therefore, it makes sense to take frequent breaks during tutoring.
2. Visual memory is very strong.
 - People tend to remember things that are unusual and suggest a mental image.
 - Connect something to be remembered with a funny or bizarre mental picture.
 - Real things are easier to remember than abstract ideas because learners can develop a mental picture of them.
 - Highlighting, underlining, or constructing charts, graphs, or tables can present a visual picture.
3. It is easier for learners to remember things that have meaning to them.
 - Help learners form associations between what is to be remembered and what they already know or what is familiar to them.
 - It is easier to remember lists of things if they are grouped by categories that form meaningful associations.
4. Repetition is critical to remembering information.
5. Guide learners in thinking about new information from different perspectives.
 - Help them make connections among pieces of information.
 - Have them look at the context in which new information can be applied.

Mnemonic Devices

Mnemonic devices are memory techniques or systems that can help learners retain information. Some are universally understood, while others make sense only to a particular individual. When developing a mnemonic device, be sure it clearly relates to the thing being remembered and make it vivid by:

- Using positive, pleasant images—the brain often blocks out unpleasant images.
- Exaggerating the size of important parts of the image.
- Using humor—funny or peculiar things are easier to remember.
- Using vivid, colorful images that are easier to remember than drab ones.
- Using smells, sounds, tastes in an image—also three dimensions and movement.
- Using rhyme.

Every **G**ood **B**ird **D**oes **F**ly

To remember the five lines on the treble clef of a musical staff. EGBDF
The sentence makes sense and, therefore, is easier to remember than a group of letters that has no meaning.

Spring ahead, fall back.

To remember how to change a clock according to Daylight Savings Time

I before E, except after C

A rhyme to remember a spelling rule.

Thirty days hath September

A rhyme to remember numbers.

In fourteen hundred ninety-two, Columbus sailed the ocean blue.

A rhyme to remember dates.

SCAFFOLDING

Scaffolds are temporary structures that physically support workers while they complete jobs that would otherwise be impossible. They provide workers with both a place to work and the means to reach work areas that they could not access on their own (Herber & Herber, 1993). Instructional scaffolding is a teaching strategy that was named for the practical resemblance it bears to the physical scaffolds used on construction sites.

Scaffolding teaches new skills by engaging students in tasks that would be too difficult for them to complete on their own. The teacher or tutor initially provides extensive instructional support, or scaffolding, to continually assist students in building their understanding of new content and process. Once students internalize the content and/or process, they begin to assume full responsibility for controlling the progress of a given task. The scaffolding initially provided by the teacher is gradually removed to reveal student understanding (Herber & Herber, 1993).

Scaffolding Instruction - Theoretical Background

Research and theory suggest that the educational outcomes of scaffolding are positive, particularly when the instructor is well prepared and aware of the theoretical basis for the technique. Cognitive and constructivist theories form the basis for instructional scaffolding as a teaching strategy. Vygotsky (1934) included scaffolding in his social constructivist theory, as do modern cognitive psychologists who have continued his work. It is well accepted among modern cognitive psychologists that students interpret and remember new content and process by building upon what they already know.

In scaffolding instruction, a more knowledgeable *other* (teacher, tutor, parent, or more knowledgeable peer) provides scaffolds (supports) to facilitate the learner’s development. The scaffolds support and promote a student’s ability to build on their prior knowledge and internalize new information. The scaffolding activities are just beyond the level of what the learner can do alone (Olson & Pratt, 2000). More capable *others* provide the scaffolds so learners can accomplish (with assistance) the tasks they could otherwise not complete, thereby helping learners through Vygotsky’s *zone of proximal development* (Bransford, Brown, & Cocking, 2000).

Vygotsky’s *zone of proximal development* (ZPD) is the gap between what learners can do independently (mastery level) and what they can accomplish with assistance (instructional level) from a teacher or tutor or more competent peer (Ellis, Larkin, & Worthington). Students are motivated to learn when teachers or tutors activate this zone by teaching concepts that are just above students’ current skills and knowledge level (Jaramillo, 1996).

Vygotsky identified three categories of academic tasks: (1) those that the student can perform independently, (2) those that the student can perform with help from others, (3) those that the student cannot perform even with help from others. **Students are in the ideal cognitive state for learning when they are working on skills in the second category—the ZPD.**

Vygotsky’s ZPD aligns with Betts’s (1946) criteria for independent, instructional, and frustration levels of oral reading. Betts described the independent or mastery level as 99 percent of word recognition accuracy, the instructional level as 95 percent, and the frustration level as below 95 percent.

Betts	independent or mastery level	instructional level	frustration level
Vygotsky	tasks a student can perform independently	tasks a student can perform with help	tasks a student cannot perform even with help



Scaffolds are temporary—as the learner’s abilities increase the scaffolding is gradually withdrawn until finally the learner is able to complete the task or master the concepts independently (Chang, Sung, & Chen, 2002). The goal is for the student to become an independent and self-regulating learner and problem solver (Hartman, 2002). As the learner’s knowledge and learning competency increases, the educator gradually reduces the supports provided (Ellis, Larkin, & Worthington).

According to Vygotsky the external scaffolds provided by the educator can be removed because the learner has developed “...more sophisticated cognitive systems, related to fields of learning such as mathematics or language, the system of knowledge itself becomes part of the scaffold or social support for the new learning” (Raymond, 2000, p. 176).

Students are guided and supported through learning activities that serve as interactive bridges to get them to the next level—they develop or construct new understandings by elaborating on their prior knowledge through the support provided by more capable others (Raymond, 2000). Studies have actually shown that in the absence of guided learning experiences and social interaction, learning and development are hindered (Bransford, Brown, & Cocking, 2000).

Vygotsky believed that the primary goal of instruction is to guide students from their elementary understandings of concepts to more advanced understandings through social interaction with teachers and tutors (Byrnes, 2001). He insisted that *social agents*, such as tutors or more skilled peers, are absolutely essential to a student’s cognitive maturation, and that a student’s thinking would forever remain on an elementary level without their influence (Byrnes, 2001).

Vygotsky also recognized that students master intellectual skills progressively, and that those who are just learning a skill make many mistakes and rely a great deal on assistance and feedback from their teachers (Byrnes, 2001). Through practice and corrective adult feedback, students progress to higher and higher levels of understanding until they reach the expert level, at which point they can perform the skill or task independently. As students progress, teachers or tutors must act as scaffolds, providing just enough guidance to allow the students to advance independently (Byrnes, 2001).

Vygotsky identified four phases of instructional scaffolding:

1. Modeling with verbal commentary.
2. Student imitation of the skill they’ve seen modeled, including commentary.
 - During this phase, the instructor must constantly assess student understandings and offer frequent assistance and feedback.
3. Scaffolding begins to be removed.
 - The instructor offers less assistance and feedback to students as they begin to master new content and/or process.
4. Students have achieved an expert level of mastery, and can perform the new task without any help from their instructor (Byrnes, 2001, p. 37).

In order for scaffolding to be effective, Vygotsky makes three important suggestions:

1. The teacher must be careful not to offer too much assistance for too long, at the risk of making students overly dependent rather than independent.
 - Following the early stages of modeling, he suggests that teachers should start a problem and have students finish it, or perhaps give hints when a student gets off track.
 - The teacher should not perform the task in its entirety for any student after the initial modeling phase is completed.
2. The level of instruction should always be within the zone of proximal development and, therefore, challenging to the students. Material presented at or below students’ level of mastery will bore them, while material presented well beyond students’ level of mastery will frustrate them. In either case, no learning can occur.
3. It is critically important for instructors to repeatedly confront their students with scientific concepts in order to prevent them from falling back on their naïve ideas of spontaneous concepts. As students of all ages are often reluctant to abandon their long held misconceptions, it is absolutely essential for instructors to adopt this form of repetition (Byrnes, 2001).

Modern Research on Scaffolding

Since Vygotsky's work, modern researchers have continued to find that scaffolding is an effective teaching strategy. Recent studies have found that the use of scaffolds is an effective strategy for teaching scientific skills. In one study, a teacher-designed table of variables (the scaffold) that: (1) helped students abstract the overall structure of the experiment, which enhanced their understanding of the design, (2) helped focus students' thinking on only those items that were important for the task, (3) made it obvious to students if they had omitted an important variable from their experiment, and (4) helped students learn what things must be considered when designing an experiment. Another study found that concept mapping (the scaffold) was effective in improving student comprehension and had better direct and transferring effects than general teaching methods, and that the use of explicit rubrics supported the scaffolding effect (Chang, Chen, & Sung, 2002).

The Scaffolding Strategy

Instructional scaffolding involves two major steps. The first step is development of instructional plans to lead the students from what they already know to a deep understanding of new material (Turnbull, Turnbull, Shank & Leal, 1999).

- Scaffolding plans must be written carefully, such that each new skill or bit of information that the students learn serves as a logical next step, based upon what they already know or are able to do.
- The instructor must prepare both to continuously assess student learning and to connect new information to the students' prior knowledge.

The second major step of instructional scaffolding is execution of the plans, wherein the instructor provides support to the students at every step of the learning process (Turnbull et. al., 1999).

- At the beginning of the process, the instructor models the task in its entirety.
- Having observed their instructor's model, the students begin guided practice by performing parts of the task independently.
- The instructor assists his or her students with their early practice and continuously assesses their learning.
- As the students gain experience with and understanding of new information or tasks, the instructor increases the complexity of guided practice activities and gradually reduces his or her support.
- By the end of a well-executed scaffolding plan, the students perform the entire task with little or no support from their instructor (Turnbull et. al., 1999).

Scaffolding Techniques

The instructor's goal in employing scaffolding techniques is offering just enough assistance to guide the students toward independence and self-regulation. There are five different instructional scaffolding techniques that can be integrated or used individually:

1. Modeling of how one should feel, think, or act within a given situation.
 - Think-alouds that verbalize the thought processes used to solve a particular problem.
 - Talk-alouds that verbalize processes while demonstrating the task.
 - Performance modeling that simply demonstrates the task to be completed without verbal explanation.
2. Offering explanations that fit the learner's emerging understanding about what is being learned—at first explanations are thorough and detailed, later they are only key words which prompt the learner to recall important information.
3. Inviting student participation engages them in learning and provides them with ownership of the learning experience.
4. Verifying and clarifying student understandings with feedback.
5. Inviting students to contribute clues (Hogan & Pressley, 1997).

According to McKenzie (1999), scaffolding:

- Provides clear direction and reduces students' confusion—educators anticipate problems that students might encounter and then develop step-by-step instructions, which explain what a student must do to meet expectations.
- Clarifies purpose—scaffolding helps students understand why they are doing the work and why it is important.

- Keeps students on task—by providing structure, the scaffolded lesson or research project, provides pathways for the learners. Students can make decisions about which path to choose or what things to explore along the path but they cannot wander off of the path, which is the designated task.
- Clarifies expectations and incorporates assessment and feedback—expectations are clear from the beginning of the activity since examples of exemplary work, rubrics, and standards of excellence are shown to students.
- Points students to worthy sources—educators provide sources to reduce confusion, frustration, and time. Students may then decide which of these sources to use.
- Reduces uncertainty, surprise, and disappointment—educators test their lessons to determine possible problem areas and then refine the lesson to eliminate difficulties so that learning is maximized (McKenzie, 1999).

Scaffolding instruction guides the learner to independent and self-regulated competence of skills. This occurs when the learner's inner speech occurs on an automatic, unconscious level (Ellis, Larkin, Worthington). In addition to improving learners' cognitive abilities, scaffolding instruction:

- Delivers efficiency—since the work is structured, focused, and glitches have been reduced or eliminated prior to initiation, time on task is increased and efficiency in completing the activity is increased.
- Creates momentum—through the structure provided by scaffolding, students spend less time searching and more time on learning and discovering, resulting in quicker learning (McKenzie, 1999).

Scaffolding Materials

Scaffolding techniques are used in conjunction with scaffolding instructional materials. Scaffolds may include models, cues, prompts, hints, partial solutions, think-aloud modeling and direct instruction (Hartman, 2002). These materials fit into one of the following categories: reception scaffolds, transformation scaffolds, or production scaffolds.

1. *Reception scaffolds* help learners to effectively gather information from available sources. They keep learners focused on important information, and they encourage learners to organize and record what they see. An example is a concept map that helps students focus questions, and provides them with a framework for organizing their answers. It helps students to identify structure already present in a given source.
2. *Transformation scaffolds* help students impose structure on information. For example, a student who is studying the metric system might be asked to classify metric units of length, mass and volume in different columns on a chart. The transformation scaffold is the blank chart, which prompts the student to categorize information logically.
3. *Production scaffolds* help students convey what they've learned in an effective way. Examples include an outline or template to help students a report.

Benefits of Scaffolding

Theory suggests that instructional scaffolding leads to a number of desirable educational outcomes.

Scaffolding:

- Motivates or engages the learner's interest related to the task.
- Engages and focuses students, so they are able to stay on task.
- Gives students more control of their learning, which motivates them to learn.
- Is individualized so it can benefit each student.
- Simplifies the task to make it more manageable and achievable for a learner.
- Provides some direction in order to help the learner focus on achieving the goal.
- Clearly indicates differences between the learner's work and the standard or desired solution.
- Reduces learner frustration and risk.
- Models and clearly defines the expectations of the activity to be performed (Bransford, Brown, & Cocking, 2000).
- Allows students to reach levels of mastery that might be impossible for them to achieve without it—it can elevate a student's understanding of a concept from the naïve level to the scientific level, whereas the student might never have progressed beyond a naïve understanding without adult intervention (Byrnes, 2001).

- Helps students achieve an expert level of understanding of a subject, characterized by organized and conditionalized knowledge of content, fluent retrieval, and positive transfer (Bransford et al, 2000).
- Develops independent learners. Providing students with scaffolds such as graphic organizers, outline templates, note taking guides, and memory strategies helps them not only with the task at hand, but also later on in their educational careers as they develop skills that will make them self-directed, self-regulated learners.

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RUBRICS

A rubric is a scoring tool that lists the criteria for assessing a learning task and provides a system for rating student performance. For example, the criteria for a student report on a social service agency might include the explanation of the agency’s purpose, a description of the services it provides, the organization of the report, and writing mechanics. The rubric articulates gradations of quality for each criterion, from excellent to poor. The four columns to the right of the criteria describe varying degrees of quality, from excellent (4) to poor (1).

Criteria	4	3	2	1
Explains purpose	Explains key and minor purposes	Explains only key purposes	Explains some purposes, but misses key purposes.	Does not refer to purposes
Describes services	Describes all services in detail	Lists all services but lacks detail	Lists some services with some detail	Lists only a few services with no detail
Organization of report- use of headings	Well-organized with effective headings in a logical progression	Organized with headings, but does not use headings effectively	Some organization within parts of report, but does not use headings	Little or no organization, no headings, information presented randomly
Writing mechanics - spelling	Correct spelling	90-99% correct spelling	80-89% correct spelling	Less than 80% correct spelling
Writing mechanics - punctuation	Correct punctuation	90-99% correct punctuation	80-89% correct punctuation	Less than 80% correct punctuation
Writing mechanics - grammar	Correct grammar	90-99% correct grammar	80-89% correct grammar	Less than 80% correct grammar

Benefits of Using Rubrics

1. Rubrics can improve student performance, as well as monitor it, by making expectations clear and by showing students how to meet these expectations.
 - The result is often marked improvements in the quality of student work and in learning.
2. Rubrics help define “quality.” One student actually *didn’t* like rubrics for this very reason: “If you get something wrong,” she said, “your teacher can prove you knew what you were supposed to do!” (Marcus, 1995).
3. Rubrics help students become better judges of the quality of their own work.
 - When rubrics are used to guide self-assessment, students become increasingly able to spot and solve problems in their own work. Repeated practice with self-assessment increases students’ sense of responsibility for their own work.
4. Rubrics provide students with more informative feedback about their strengths and areas in need of improvement.
5. Rubrics allow for gradations of quality.
6. Rubrics provide a means to ensure that evaluation of student work is consistent among students and assessors.

Points or terms can be used to identify range/scoring levels.

- Needs Improvement...Satisfactory...Good... Exemplary
- Beginning...Developing...Intermediate... Advanced
- Needs work...Good...Excellent
- Novice...Apprentice...Proficient...Distinguished
- Numeric scale ranging from 1 to 5, for example
- Presence to absence
- Complete to incomplete
- Many to some to none
- Major to minor
- Consistent to inconsistent
- Frequency: always to generally to sometimes to rarely

Steps in Developing A Rubric

- Determine learning outcomes.
- Focus each rubric item on a different skill.
- Determine criteria.
- Determine gradations of quality. Describe the best and worst levels of quality, then, fill in the middle levels based on your knowledge of common problems and the discussion of not-so-good work. Think of gradations as: *Yes*; *Yes, but*; *No, but*; and *No*.
- Avoid unclear language.
- Avoid unnecessarily negative language.

Sample Paragraph Rubric

Design: 4 = highest; 1 = lowest
Acceptable level = 3

Points	4	3	2	1	Points
Main/Topic Idea Sentence	Main/Topic idea sentence is clear, correctly placed, and is restated in the closing sentence.	Main/Topic idea sentence is <u>either</u> unclear or incorrectly placed, and is restated in the closing sentence.	Main/Topic idea sentence is unclear <u>and</u> incorrectly placed, and is restated in the closing sentence.	Main/Topic idea sentence is unclear and incorrectly placed, and is not restated in the closing sentence.	
Supporting Detail Sentence(s)	Paragraph(s) have three or more supporting detail sentences that relate back to the main idea.	Paragraph(s) have two supporting detail sentences that relate back to the main idea.	Paragraph(s) have one supporting detail sentence that relate back to the main idea.	Paragraph(s) have no supporting detail sentences that relate back to the main idea.	
Elaborating Detail Sentence(s)	Each supporting detail sentence has three or more elaborating detail sentences.	Each supporting detail sentence has at least two elaborating detail sentences.	Each supporting detail sentence has one elaborating detail sentence.	Supporting detail sentences do not have an elaborating detail sentence.	
Legibility	Legible handwriting, typing, or printing.	Marginally legible handwriting, typing, or printing.	Writing/typing is not legible in places.	Writing/typing is not legible.	
Mechanics and Grammar	Paragraph has no errors in punctuation, capitalization, and spelling.	Paragraph has one or two punctuation, capitalization, and spelling errors.	Paragraph has three to five punctuation, capitalization, and spelling errors.	Paragraph has six or more punctuation, capitalization, and spelling errors.	
				<i>Total Points</i>	

Scoring

Total possible points = 20.

Lowest passing score = 14 points (70%)

Sample Research Rubric

Design: 4 = highest; 1 = lowest

Acceptable level = 3

Points	4	3	2	1	Points
Introduction/ Topic	Student properly generates questions and or problems around a topic.	Student generates (with some difficulty) questions and or problems.	Student requires prompts to generate questions and or problems.	All questions or problems are assessor-generated.	
Conclusions Reached	Numerous detailed and logical conclusions are reached from the evidence offered.	Several detailed (but not necessarily logical) conclusions are reached from the evidence offered.	Some weak conclusions are reached from the evidence offered.	No conclusion is made from the evidence offered.	
Information Gathering	Information is gathered from multiple electronic and non-electronic sources and cited properly.	Information is gathered from multiple electronic and non-electronic sources, but not cited.	Information is gathered from limited sources and not cited.	Information is questionable.	
Summary Paragraph	Well organized, demonstrates logical sequencing and sentence structure.	Well organized, but demonstrates illogical sequencing <u>or</u> sentence structure.	Well organized, but demonstrates illogical sequencing <u>and</u> sentence structure.	Weakly organized.	
Punctuation, Capitalization, & Spelling	Punctuation and capitalization are correct.	There is one error in punctuation and/or capitalization.	There are two or three errors in punctuation and/or capitalization.	There are four or more errors in punctuation and/or capitalization.	
				Total Points	

Scoring

Total possible points = 20.

Lowest passing score = 14 points (70%).

Sample Writing Rubric

Design: 1 = lowest; 4 = highest (order is different)

Acceptable level = 3

	1	2	3	4	Points
Organization	Sequence of information is very difficult for reader to follow.	Reader has some difficulty following work because student jumps around.	Student presents information in logical sequence which reader can follow.	Information is in a logical, interesting sequence which reader can follow.	
Content Knowledge	Student does not have grasp of information; student cannot answer questions about subject.	Student is uncomfortable with content and has difficulty demonstrating basic concepts.	Student is at ease with content, but fails to elaborate on concepts.	Student demonstrates full knowledge of content and concepts.	
Grammar and Spelling	Work has four or more spelling errors and/or grammatical errors.	Presentation has three misspellings and/or grammatical errors.	Presentation has no more than two misspellings and/or grammatical errors.	Presentation has no misspellings or grammatical errors.	
Neatness	Work is illegible.	Work has three or four areas that are sloppy.	Work has one or two areas that are sloppy.	Work is neatly done.	
References	Work displays no references.	Work does not have the appropriate number of required references.	Reference section was completed incorrectly	Work displays the correct number of references, written correctly.	
				Total Points	

Scoring

Total possible points = 20.

Lowest passing score = 14 points (70%)

CRITICAL THINKING STRATEGIES

According to Michael Scriven and Richard Paul for the National Council for Excellence in Critical Thinking Instruction: “Critical thinking is the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action..”

Beyer (1985) adds that “critical thinking has two important dimensions. It is both a frame of mind and a number of specific mental operations” (p. 271).

Research indicates that critical thinking strategies make a positive difference in the achievement levels of participating students. Studies which looked at student achievement over a period of time found that thinking skills instruction accelerated the learning gains of learners (Cotton, 1991).

Potts (1994), summarized several discrete critical thinking skills that have been identified by educational researchers:

- Finding analogies and other kinds of relationships between pieces of information.
- Determining the relevance and validity of information that could be used for structuring and solving problems.
- Finding and evaluating solutions or alternative ways of treating problems.
- Asking open-ended questions that do not assume *the one right answer*—open-ended questions encourage students to think and respond creatively, without fear of giving the *wrong* answer.
- Allowing sufficient time for students to reflect on the questions asked or problems posed—encouraging students to deliberate and ponder, and letting them know that the immediate response is not always the best response.
- Teaching for transfer—providing opportunities for students to see how a newly acquired skill can apply to other situations and to their own experiences.

Teaching Strategies

Provide instruction in a variety of specific creative and critical thinking skills, study techniques, and metacognitive skills, and try to incorporate some of the following strategies in your daily teaching activities.

- Increase the length of time you wait for a learner to respond to a question. Some teachers count to themselves from one to fifteen to formally structure wait time. By providing at least five seconds of thinking time after a question and after a response, you encourage broader participation and more thoughtful responses. It gives learners the message that fastest is not necessarily smartest, and that it is okay if there is a period of silence. This practice helps reduce spontaneous, poorly reasoned responses. Once learners are accustomed to this practice, it works well and provides richer, more meaningful discussions.
- Ask learners higher-order questions that require comparing, contrasting, and otherwise analyzing information.
- Using probing techniques to encourage more in-depth thinking and responses.
- Reinforce higher-level thinking by listening thoughtfully to learners’ responses and providing immediate feedback.
- Engage learners in problem solving and discuss the rationales learners use to come to solutions.
- Teach decision-making, planning, and forecasting skills.
- Teach the use of paraphrasing to clarify information, and outlining, cognitive maps, and advance organizers to structure information.
- Use a combination of direct instruction, inferential learning, and infused learning, and include a wide variety of teaching modalities.
- Provide well-planned activities and with clearly stated guidelines. Encourage active participation of learners and acknowledge every response. Create experiences that will ensure success at least part of the time for each learner.
- Model thinking skills.

- Employ guided discussion where you play the role of the guide or the primary questioner; structure conversation to lead to specific conclusions or understandings. Ask questions that require learners to interpret, explain, apply, generalize, synthesize and summarize.
- Engage learners in reflective discussions; begin by introducing the topic with a leading question that challenges learners to think creatively and critically. Try topics that are controversial in nature or deal with a contemporary issue, and ask questions that lead to original and evaluative thinking.
- Try to vary your questioning styles to include open-ended, probing, and guiding questions with less emphasis on yes/no and recall questions. Ask follow-up questions (for example: “Why? How do you know? Do you agree? Will you give an example? Can you tell me more?”). Cue responses to open-ended questions (for example: “There is not a single correct answer to this question. I want you to consider alternatives.”).
- Always ask learners to describe how they arrived at their answer.
- Frequently ask learners to summarize what has been said to promote active listening.
- Play the devil’s advocate and require learners to defend their reasoning against different points of view.
- Encourage learners to question.

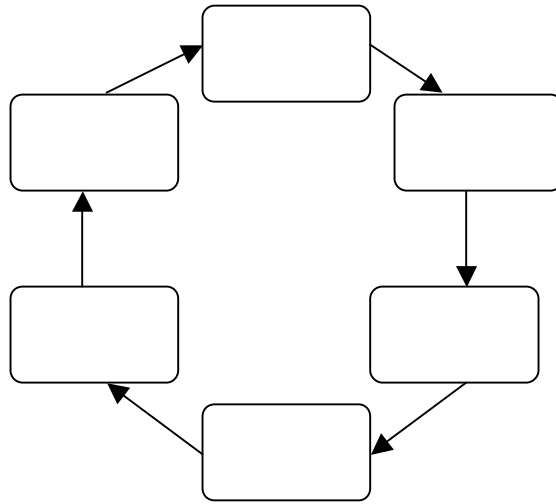
Graphic Organizers

Graphic organizers are visual representations of ideas and objects that aid student learning. They are especially useful for helping visual learners arrange ideas about subjects, and to make connections. They allow the presentation of essential and connected concepts and help learners fit new information into a framework of prior knowledge. They can be used to express thoughts, ideas, or theories in ways that information can be actually seen by students, and serve as enhancers to educators and reinforce the lesson being taught. There are several types of graphics organizers with different functions.

Types of Graphic Organizers	Cause & Effect	Sequence	Relationships	Contrast, similarities, and differences	Problem-solving
Cycle diagram	X	X	X		
Venn diagram			X	X	
Matrix/charts			X	X	
Webs/maps			X		
Flowchart	X	X	X		
Network/tree diagram			X		
Fishbone map	X	X	X		X

Cycle Chart

A cycle chart is used to provide a visual representation of a sequence of events that proceeds in a cyclic process:



Matrix/Opinion Charts

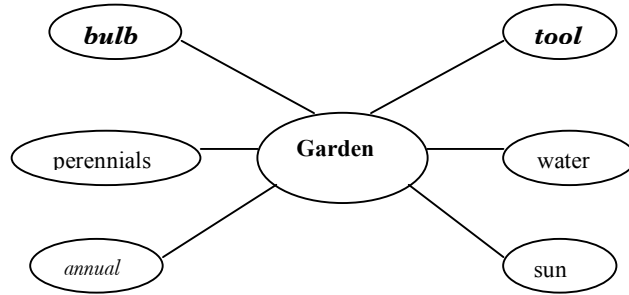
A matrix can help solve a problem by sorting and presenting factors in a table. Information can be separated, categorized, and compared, and patterns can be identified. Matrix logic then requires gathering information from clues and fitting the clues together.

An opinion chart is a matrix of rows and columns for organizing ideas about an event, concept or a person. Opinions charts help develop critical thinking skills and logically construct a convincing argument, and can be used for current topics of interest to adult students. They can collect information and organize their ideas in a systematic way. The first column of an opinion chart lists the main topic that will be evaluated. The second column allows the learner to state their opinion about the main topic. The third column summarizes information supporting the learner’s opinion.

Issues	For	Against	Undecided
Issue 1		X	
Issue 2	X		
Issue 3	X		
Issue 4			X

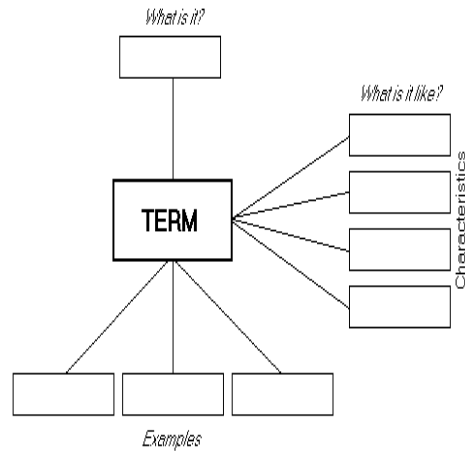
Webs

Used to show the relationship of specific parts or ideas to a main body or theory. The user must be able to determine the sub areas of the main idea.



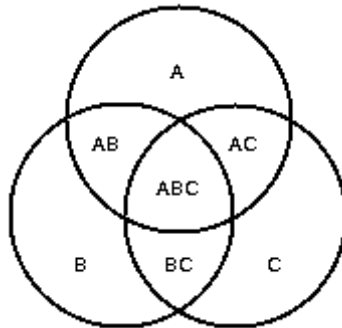
Semantic Maps

Semantic maps are diagrams that illustrate the relationship between words. They can be used as a pre--post reading technique, a prewriting activity, a study skill strategy and a vocabulary development strategy. A semantic map has four steps: (1) the learner selects a topic that is of interest to them (2) above the idea or concept, the learner writes the major category "what is it" (3) to the right of the concept or term the characteristics are listed, and (4) below the term the learner can list examples. The student can summarize traits of an idea or concept and organize the information. Semantic maps can generate ideas, build on prior knowledge and connect new information with known information. They are a valuable tool for developing vocabulary and conceptual understanding (Works, 1999).



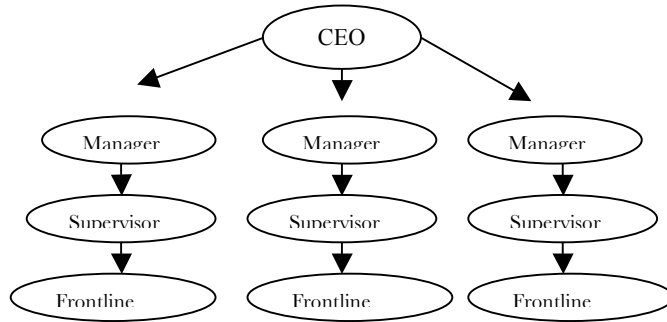
Venn Diagrams

Venn diagrams help students view the independent and interrelated traits similar to both and organize new information. The information is arranged in the two large intersecting circles allowing the student to name each concept. Characteristics unique to each concept are written in each circle. The student can determine the characteristics shared by both concepts and write them in the intersecting circle.



Flow Chart

Use to show sequence of events or hierarchy of items, positions, events, etc..

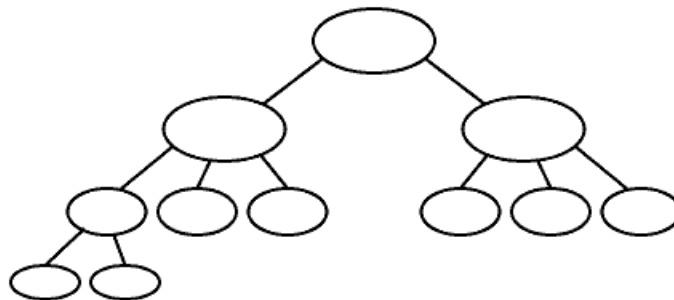


Network or Tree Diagram

A decision or event tree is another way to structure a problem. It is a diagram that graphically illustrates choices and their outcomes.

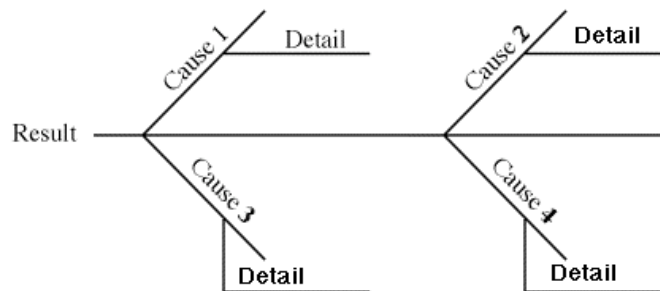
The Process:

- Identify the problem.
- Identify all major factors or issues to be analyzed.
- Identify all alternatives for each factor or issue.
- Construct the decision tree portraying all alternatives.
- Different scenarios or sequences are illustrated by different branches of the tree.
- Branches are mutually exclusive.
- Branches are collectively exhaustive in that they incorporate all possibilities and there are no other options.



Fishbone Map

A fishbone map is used to show the causal interaction of a complex event. Key frame questions: What are the factors that cause X ? How do they interrelate? Are the factors that cause X the same as those that cause X to persist?



Problem-Solving Skills

The following is a basic problem-solving strategy that involves a variety of thinking skills. Review the entire strategy and then each of the steps with learners. Discuss and work on the specific skills needed to implement each step.

Basic Problem-Solving Strategies

1. State the problem in as many different ways as possible to make sure you understand the problem. A problem that is understood is half-solved.
2. Get the facts to determine what is known and what information is needed.
3. Analyze the situation and assumptions to determine if they are valid.
4. Based on what you know, restate the problem and begin to develop as many solutions as possible.
5. Review all solutions and select the one that best solves the problem.

Problems are characterized by factors and issues; identifying major factors and issues is an important first step toward solving the problem.

- Factors are things, circumstances, or conditions that cause something to happen.
- Issues are points to be argued regarding factors.

For example: The major factor of a car accident is that one driver crossed the middle of the road into the path of an oncoming car. The issues include why the driver crossed into the path of the other car: driving under the influence of alcohol, speeding, mechanical failure, etc.

Converging and Diverging

Problems should be resolved in two directions:

- Focusing on and moving toward a single point (converging)
- Considering new information or alternative solutions (diverging).
- Both are needed for effective problem solving.

Converging focuses the view of a problem.

- Converging activities identify factors and issues, and differentiate between fact and assumptions.

Diverging opens the mind to new ideas.

- Diverging activities include brainstorming which results in a list of possible problems, causes of problems, or solutions to problems; the more ideas, the greater the likelihood of one that works.

Comparing Information—An Analogy

An analogy is a logical way of making a comparison. It compares relationships between two different sets of items. The items in one set must be related to each other in the same way as the items in the other set.

1. Start out with one set and determine the relationship between the two items.

For example:

- Are they opposites?
- Do they mean the same thing?
- Is one a part of the larger whole?
- Does one come before or after the other?

2. Do the same with the other set of two items.
3. Compare the two sets to see if the relationships are the same.
4. The relationships must be in the same order.
5. Analogies can be mathematical.
6. If the relationships are the same and in the same order in the two sets, it is an analogy.

Analogies must be written as: _____ is to _____ as _____
is to _____.

Problem Solving Strategy

Step One: Define the Problem

Recognizing that a problem exists and then defining it are often more difficult than solving it.

Step Two: Collect Facts and Information

Sometimes it is difficult to identify what information will be needed to solve a given problem, and finding that information can also be difficult.

1. First analyze the situation and assumptions to determine if they are valid.
2. Then identify who is involved and their needs.
3. Determine what data are needed about feelings and events.
4. Problems are characterized by issues and factors. Factors are things, circumstances, or conditions that cause something to happen. Issues are points to be argued regarding factors. Identify the issues and factors.

For example: There is an accident involving two cars. The major factor might be that one driver crossed the middle of the road into the path of an oncoming car. The issue would be why the driver crossed into the path of the other car, for example: Was the driver under the influence of alcohol? Was the driver speeding? Was there mechanical failure?

Step Three: Begin to Develop Possible Solutions

1. Examine the problem from many perspectives.
2. Based on what you know, restate the problem and begin to develop as many solutions as possible.
1. Brainstorm to find varied solutions with interesting potentials.

Step Four: Select the Best Solution

1. Review and evaluate all solutions, remembering that solutions have consequences that matter.
2. Problems often have many solutions and the criteria for what constitutes a best solution are often not clear, so take care to select most appropriate criteria.
3. Consider which solution meets the most needs of everyone involved.
4. Consider which solution is acceptable to all those involved.

Step Five: Develop An Action Plan to Implement the Solution

- Establish a timeline to carry out the solution.
- Clearly identify WHO will do WHAT, WHERE, and WHEN.

Step Six: Evaluate the success of the solution

- If necessary, redefine the problem and brainstorm new solution alternatives.

Decision-Making Skills

Adult learners have to make important decisions as parents, workers, and citizens. When teaching decision-making strategies, use real-life contexts as much as possible to illustrate the applications of specific skills. When appropriate, embed decision-making skills in other learning activities.

Provide adult learners with the following strategy to guide them when they are faced with making a decision. Review the entire strategy with learners and then discuss each step and the skills it involves. Provide learners with some practice activities. At first, work with learners; then allow learners to work through the decision-making process on their own.

Step 1: The Question

- Formulate a question that addresses the issue in the clearest way possible.
- Make sure the right question has been asked.
- Identify priorities for the question.

Step 2: The Alternatives

- Gather information relevant to answering the question.
- Create as many alternative answers as possible to the question.
- List all possible options and consider all alternatives.

Step 3: The Consequences

- Evaluate each of the alternatives and consider all possible consequences.
- Predict the likely outcomes and allow for contingency plans.

Step 4: The Decision

- Weigh the possibilities of succeeding with each alternative.
- Measure the balance between risk and reward offered by each alternative.
- Consider priorities in terms of alternatives.
- Don't rush to a conclusion.
- Recognize, accept, and commit to your decision.

The following graphic organizer can help learners consider various alternatives before making a decision.

- Have learners write the problem in the form of a question in the Problem Box.
- To make sure the right question has been asked, have learners write what they hope to accomplish in the Goal Box.
- Have learners list the alternative answers in the Alternatives Box.
- To evaluate the consequences of each alternative, have learners write the pros and cons for each alternative in the Pros and Cons Box.
- Have learners evaluate the alternatives based on their pros and cons, and write the best alternative (their decision) in the Decision Box.
- To check their reasoning, have learners explain why they made that decision in the Reasons Box.

Problem	Goal
Alternatives	Pros (+) Cons (-)
Decision	Reasons

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READING THEORIES AND STRATEGIES

	Traditional Views	Newer Definitions
Research base	Behaviorism	Cognitive sciences
Reading goals	Mastery of isolated facts	Constructing meaning
Reading process	Mechanically decoding words, memorizing by rote	Interaction among reader, text, and content
Learner role	Passive receiver of knowledge	Active, strategic reader
Theories/Models	Competing approaches to reading instruction— bottom-up and top-down models	Emphasis on different pieces of the process
Teaching	Traditional skills instruction	Cognitive strategy instruction and teaching strategies within the content areas

Cognitive Science Approach to Reading

According to cognitive scientists:

Meaning is not the words on the page—the reader constructs meaning by making inferences and interpretations.

- How well a student constructs meaning depends in part on metacognition—which is the student’s ability to think about and control the learning process.
- Comprehension results from interaction among the reader, the strategies the reader employs, the material being read, and the context in which reading takes place.

The essence of learning is linking new information to prior knowledge and the experiences of students.

- This involves valuing diversity and building on the strengths of students.

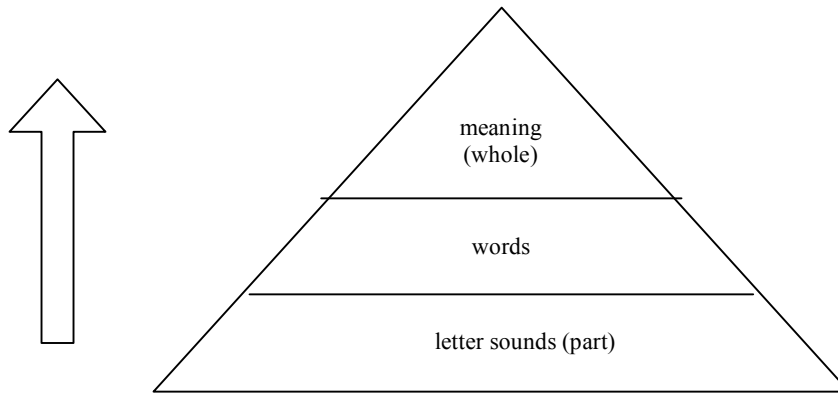
Reading and writing are integrally related—writing improves comprehension and reading about a topic improves writing.

- Also involves integrating critical thinking.

Three stages of reading strategies.

- *Preparing for reading*—which activates prior knowledge and includes using headings and graphics, predicting topics and organizational patterns, setting goals and identifying purposes for reading, and choosing appropriate strategies.
- *Reading to learn*—which involves finding the main idea, selecting important information, monitoring comprehension, modifying predictions, comparing new ideas with prior knowledge, connecting and organizing information, and summarizing text segments.
- *Reflecting on information*—which includes reviewing and summarizing the main ideas from the text as a whole, considering and verifying how ideas are related, changing prior knowledge to reflect newly learned information, assessing purpose for learning, identifying gaps in learning, and generating questions.

Bottom-Up Model (Gough, 1972)



A bottom-up reading model emphasizes a single-direction, part-to-whole processing of a text. In the beginning stages it gives little emphasis to the influences of the reader's world knowledge, contextual information, and other higher-order processing strategies (Dechant, 1991).

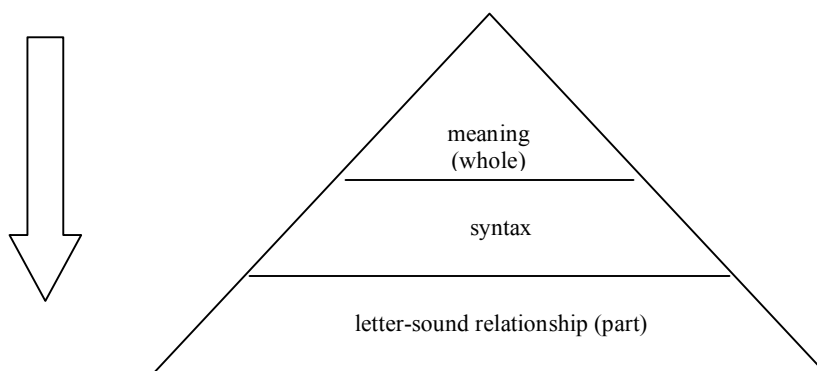
A bottom-up reading model:

- Emphasizes the written or printed text.
- Says reading is driven by a process that results in meaning.
- Proceeds from part to whole.

Bottom-up model advocates believe the reader needs to:

1. Identify letter features
2. Link these features to recognize letters
3. Combine letters to recognize spelling patterns
4. Link spelling patterns to recognize words, and
5. Then proceed to sentence, paragraph and text-level processing.

Top-Down Model (Goodman, 1970)



The top-down reading model suggests that processing of a text begins in the mind of the readers with meaning-driven processes, or an assumption about the meaning of a text. Readers identify letters and words only to confirm their assumptions about the meaning of the text (Dechant, 1991).

- Comprehension is the basis for decoding skills, not a singular result.
- Meaning is brought to print, not derived from print.

Features of a top-down approach to reading include:

- Readers can comprehend a selection even though they do not recognize each word.
- Readers should use meaning and grammatical cues to identify unrecognized words.
- Reading for meaning is the primary objective of reading rather than mastery of letters, letter/sound relationships, and words.
- Reading requires the use of meaning activities rather than the mastery of a series of word-recognition skills.
- The primary focus of instruction should be the reading of sentences, paragraphs, and whole selections.
- The most important aspect about reading is the amount and kind of information gained through reading (Gove, 1983).

This model is most often associated with the whole language approach as it:

- Emphasizes what the reader brings to the text.
- Says reading is driven by meaning.
- Proceeds from whole to part.

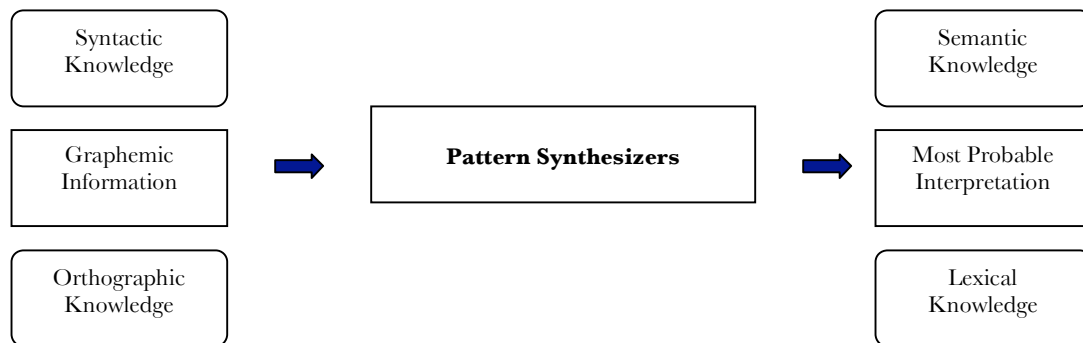
According to Frank Smith, reading researcher (1994):

- Reading is not decoding written language to spoken language.
- Reading does not involve the processing of each letter and each word.
- Reading is a matter of bringing meaning to print, not extracting meaning from print (McCormick, 1988).

Although Goodman is often referred to as a leading advocate of the top-down approach, his model by his own admission is interactive, "...it is one which uses print as input and has meaning as output. But the reader provides input too, and the reader, interacting with text, is selective in using just as little of the cues from text as necessary to construct meaning" (Goodman, 1981).

Interactive Model (Rumelhart, 1977)

The interactive model is not simply a bottom-up or top-down model, but instead synthesizes patterns.



An interactive reading model is a reading model that recognizes the interaction of bottom-up and top-down processes simultaneously throughout the reading process. It attempts to combine the strengths of both the bottom-up and top-down models, making it one of the most promising approaches to the theory of reading (McCormick, 1988)

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THE WRITING PROCESS STRATEGY

Flower and Hayes (1980) suggested that there are essentially three cognitive writing processes:

1. Planning (deciding what to say and how to say it).
2. Text generation (turning plans into written text).
3. Revision (improving existing text).

Dyson and Freedman (1991) found that the different writing processes do not occur in any fixed order, but proceed in an organized way that is largely determined by the individual writer's goals. At one moment, students might be writing, and, at the next moment, they might backtrack, reread, and rewrite what they have written. This model is usually called the *writing process approach*, but is also known as a *knowledge-transforming model*. This model engages students in problem analysis and goal setting. Students analyze content or the best way to organize their writing in terms of previously presented information and the intended reader. They develop and evaluate plans for how to resolve their writing concerns. As one writing problem is solved, others are created, and, in this way, new content is generated or new ideas about how to organize text are developed.

Writing Processes

People approach writing in different ways, but there are some processes that every writer seems to use. These processes are not exclusive of each other and may necessitate returning to a process that has already been completed. They include:

- Developing a thesis or topic, which is the central purpose of writing.
- Identifying the audience, and selecting the writing tone and style to best communicate the purpose of writing.
- Engaging in pre-writing activities to generate ideas.
- Outlining to further develop, structure, and logically organize a topic through main ideas and supporting details.
- Creating a first draft of the text in paragraphs with purpose, tone, topic sentences, and supportive sentences.
- Revising to keep ideas in line with the main idea of the paragraph, often replacing a whole statement with one that better supports the main idea. It involves subject and purpose, paragraphs, sentences, and format.
- Editing, which involves style, grammar, punctuation, and word choice.
- Proof reading to check spelling and grammar

Writing Anxiety

Many adult learners experience writing anxiety. This is often because they are afraid to make mistakes, as they fear humiliation or embarrassment. They need to be assured that:

- Being a good writer *does not* mean having everything right the first time, and not making any mistakes.
- They *will not* have to rely on their personal experiences when writing and that, in fact, they all have experiences that will help them become good writers
- Writing *does not* require that they always edit, rewrite, and revise a certain number of times, with no regard to the actual piece of writing.

REVISION AND EDITING CHECKLIST

Subject

- Thesis (purpose)
- Unified and complete information
- Tone

Shape

- Organizational pattern
- Transitional words
- Introduction and conclusion
- Coherent information

Paragraphs

- Main idea
- Topic sentences
- Examples
- Details
- Transitional words

Sentences

- Complete sentences
- Sentence variety
- Transitional words

Format

- Punctuation
- Page setup

Learners often do not understand:

- That you can learn through reading and gain the knowledge you need to write.
- That writing is a process that involves several sub-processes.
- The concept of a first draft or the concept of revising.

Pre-Writing Techniques

Brainstorming

Brainstorming is a technique for generating new ideas and promoting creative thinking. It requires a problem statement that is specific enough to help learners focus, but open enough to allow innovative thinking. Brainstorming can either be carried out by individuals, pairs, groups, or a combination of individuals, pairs, and groups.

Ground Rules for Brainstorming

- Explain the rules to learners.
- Set a time limit of 20 to 25 minutes.
- Present the problem or topic with one or two examples.
- Guide and encourage learners to generate as many ideas as possible.
- During brainstorming, all ideas are welcome, there are no wrong answers, no judgments should be made of ideas, and every point of view is valuable.
- Learners should be encouraged to be creative in their contributions.

When brainstorming stops:

- Combine and group similar ideas and concepts.
- Eliminate duplicate ideas and responses that definitely do not fit.
- Select or vote on the best ideas to consider.

Freewriting

Freewriting is a method for developing a topic; it is similar to brainstorming. It is also a great way to develop writing fluency. There is only one rule with freewriting—the writer can't stop. The idea behind freewriting is to not think before writing.

- You can have learners do their first freewriting exercise on an index card to make the process less intimidating.
- Tell learners to write on a specific topic, if they can; if they don't have a topic, have them write anything until an idea comes to them.
- Use your judgment to determine how long learners should write; you might want to start by giving them about five minutes. If learners stop writing, encourage them to continue until the time is up.
- Ask learners to write flowing sentences—freewriting looks like paragraphs, not like a list.
- Tell learners not to worry about correct punctuation, grammar, or spelling.
- When time is up, tell learners they can stop when they get to the end of the idea or sentence they are writing.

Focused Writing

Focused writing can be very helpful to adult learners when they need to come up with ideas for first drafts. The procedures are basically the same as for freewriting, except that learners write ideas related to a specific word or phrase. There is still only one rule—no stopping.

Quick Writing Techniques

Listing: Have learners jot down ideas as they occur to them. They should write quickly, using words or phrases—the goal is to write down as much as possible. Have learners review their list, looking for similarities, opposites, or ideas that seem attractive to them. Learners can add to their list or create a web, map, or outline from the list.

Sketching: A sketch can be an actual drawing, chart, diagram, etc. Learners can use a sketch to think on paper and to generate ideas and details.

Collaborating: Have learners talk with someone else about their topic. When discussing writing ideas, the give and take of conversation will help learners focus their thinking.

Questioning: Have learners use the list of questions for journalists—the 5W's and H: Who, What, When, Where, Why, and How?

Writing Practice for Adult Learners

Writing practice is important—play writing games or give learners writing assignments so they can practice their skills. To motivate learners, make writing practice interesting and fun, for example:

1. Write a three-word sentence, and ask learners to rewrite the sentence, adding one word. Continue taking turns to add a word, until no one can think of anything more to add.
2. Help learners write an autobiography consisting of short essays about meaningful times or events.
3. Have learners make a list of related ideas about a particular subject and then develop an outline for an essay or narrative.
4. Ask learners to write a description of their neighborhoods or workplaces.
5. Ask learners to write a newspaper article about a current event.
6. Cut out cartoons from the newspaper and, using whiteout, cover the dialog. Have learners write their own dialog.
7. Give learners a half-completed sentence and have them finish it.

Loop Writing

Loop writing is a way of helping learners link paragraphs together forming a coherent text. Using a web or map, learners write the first paragraph. They summarize the first paragraph in one sentence and use it to start the second paragraph. Learners use a sentence to summarize the second paragraph and to start the third paragraph, and continue on in that way. When they are finished, learners read what they have written and check their writing as a whole text.

Speedwriting

Speedwriting develops fluency; learners need to concentrate on ideas, not on language, grammar, or punctuation. Tell learners they have only 15 minutes to write on a specific topic. They need to write as quickly as possible and should not stop. Learners cannot cross anything out or correct mistakes during this time. Once the time is up, shout, “stop!” Have learners read aloud what they have written and then let them correct mistakes.

Autobiographies

Most researchers agree that autobiographical writing promotes learning and growth as it enables learners to bring a sense of order to life, to highlight important moments, and to gain insight into their own development. Dominic (2000) promotes an *educational biography* process that involves each student's preparation of oral and written autobiographical narratives, focused around a life theme chosen by the adult; the narratives are presented to and interpreted by a small peer group of students. Birren and Deutchman (1991) combine individual reflection and writing with the sharing of life stories (about family, career, money, decision points, or loss) in a supportive group. According to Birren and Deutchman, this process of autobiographical writing contributes to continuing development, ability to adapt to the changes of aging, a sense of integration and fulfillment, and cognitive functioning among older adults. Autobiographies empower learners as they recognize that they are not only the main character, but also the author of that story.

Cubing

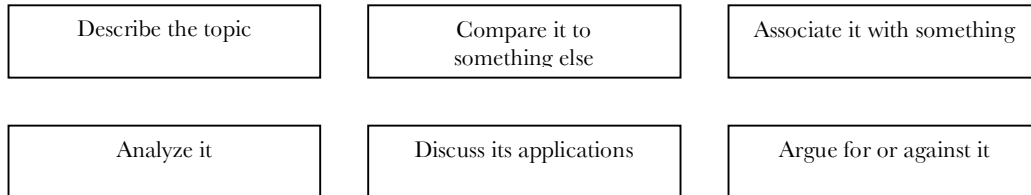
Cubing is a pre-writing technique that guides learners in exploring various aspects of a topic; it encourages learners to think and re-think a topic. A cube has six sides and if you had to describe that cube, you would try to discuss all the sides of the object from different perspectives. Cubing follows that same process and examines various perspectives of an object or idea.

Have learners write about six perspectives/aspects of their topic by filling in the six boxes. They should write on each perspective or aspect for equal amounts of time (approximately three to five minutes per perspective). Ask learners to start from what they know and to keep going until they have written about their topic from all six perspectives. The order in which they write is not important.

Before learners begin, review what they should write in each box.

- Describe the topic: Physically describe your topic. What does it look like, sound like, smell like, etc?

- Compare: How is your topic similar to other topics or things? How is it different?
- Associate: What other topic or thing does your topic make you think of? Can you compare it to anything else in your experience?
- Analyze: Look at your topic's components. How are these parts related? How is it put together? Where did it come from? Where is it going?
- Application: What can you do with your topic? What uses does it have?
- Argue: What arguments can you make for or against your topic?



Creative Writing

Mini-Sagas

Mini-sagas began as a contest in 1982 in the English newspaper, the Sunday Telegraph. A saga is a story about a group of people over a long period of time. It has exactly 50 words, not including the title, which can have up to 15 words. It must have a beginning, middle, and end. Learners can use a prompt to write about, such as a photo or a proverb. After learners write a draft of their saga they may give it to another learner to edit; the original writer then revises the story, making sure it is 50 words.

Haiku

Haiku is a form of short poetry that originated in Japan in the 1600's and is usually connected to nature. Haiku typically follows a 17-syllable, 5-7-5 structure that is divided into three lines. For beginning writers, you can vary this structure; for example, a 16-syllable, 4-6-6 structure. Haiku does not use rhyme, but it does have a smooth and flowing rhythm. Good haiku is said to be one-breath long. Because it requires writers to sum up their thoughts in two to three lines, Higginson and Harter (1985) believe that learners' reading, writing, and speaking skills improve through writing haiku. Learners become more proficient in identifying main ideas; they improve their reading comprehension, and can write and speak more concisely and accurately about a situation.

BioPoem

A biopoem is a structured collection of vivid details about a character's life, personality traits, and aspirations. Learners begin each line with the words in quotes (where indicated) and supply the details requested in the parentheses.

Line 1: (Character's first name)

Line 2: "Relative of..." or "Friend of..." (List 3 or 4 relatives or friends)

Line 3: (List 4 character traits that would describe this person or his personality)

Line 4: (Position or job)

Line 5: "Lover of..." (3 things, people, activities, etc.)

Line 6: "Who felt..." (3 emotions and explanations)

Line 7: "Who has been..." (3 places or events this character has been to)

Line 8: "Who needed..." (3 descriptions of things this character may have needed)

Line 9: "Who feared..." (3 descriptions of things this character may have feared)

Line 10: "Who gave..." (3 descriptions of what this character has given to family, friends, the world, etc.)

Line 11: "Who longed for..." (3 descriptions)

Line 12: "Who would like to have seen..." (3 descriptions of things the character may have wanted to see)

Line 13: (Synonym - one profound word that describes the character)

Line 14: “Resident of...” (description of place, dates, location, etc.)

Line 15: (Character's last name)

Random Words Epigraph

Ask learners to randomly select 15 entries from a dictionary by flipping through the pages, with eyes closed, and putting their finger down on the page. Have them write the word that is closest to their finger. Using at least 10 of the 15 words in their list of dictionary entries, ask learners to create a poem. They can add articles, helping and to be verbs, coordinating conjunctions, and prepositions. Have learners use their poem as an epigraph for a short story that incorporates the themes and images that are included in their poem. The relationship between their poem and short story should be clear to readers, but not stated. Their job is to use the poem as a jumping off point. Learners can add more images and themes, but those that are included in their poem should be the major images and themes in their story.

Journals

Journals provide adults with an opportunity to record their thoughts, reactions, and feelings. They are effective instructional tools that strengthen critical thinking skills, as well as writing skills. Journal entries can reveal thinking processes and help learners make their thoughts concrete. Many adults enjoy keeping journals and should be encouraged to do so.

Journals can be designed in a variety of ways—the important part is the process, not the outcome. When engaging learners in journal writing, be sure to provide them with guidelines, starting with defining the purpose of the journal and how their journal will be used. They need to know how often to write, when to write, and the standards for grammar and spelling. If learners are to use one specific type of format, they need to know the process and expectations for that type of journal. If they can select a type of format, they need to have information about the various journal types, formats, and processes.

Schneider (1994) claims that journal writing is closest to natural speech, and writing can flow without self-consciousness or inhibition. Sommer (1989) reports that journals are a safe place to practice writing daily without the restrictions of form, audience, and evaluation; they are a less threatening way for adult learners to write and express themselves in a way they might not in class (Grennan, 1989). Journals promote growth through critical reflection, helping learners “make meaning out of what is expressed” (Clark 1994). Journal writing enables learners to articulate connections between new information and what they already know, makes thoughts visible and concrete, and provides a way to interact with, elaborate on, and expand ideas. Clark and Grennan have found that journal entries demonstrate movement through Kolb's modes of experiential learning: recording a concrete experience or feeling, reflecting on and observing the experience, integrating the observation into abstract concepts or theories, and using the theories to make decisions and solve problems. Moreover, a journal is written in the learner's authentic voice, and this personal engagement adds a necessary affective element to the learning process.

Encourage learners to set aside a time for journal writing, starting with two or three times a week and working up to writing every day. In free-writing or personal journals, learners are encouraged to write their thoughts without having to share them with anyone else. Reflection journals are a variation of this type of journal; reflection journal entries respond to something learners have read, done, or heard.

Dialog Journals: Learners and teachers or tutors communicate regularly through journal entries that focus on meaning, rather than form, and on real topics and issues of interest to the learner. Learners write on any topic (unless a particular theme has been assigned), and the teacher or tutor writes back regularly without correcting errors. Through the journal, teachers and tutors gain knowledge of learners' interests and problems, which can lead to individualized instruction for each learner. As learners continue to write and read their teacher's or tutor's writing, they are likely to develop confidence in their own ability to express themselves in writing; their writing becomes more fluent and interesting, and the mechanics of their writing improve.

Critical Incident Journals: Entries focus on particular incidents or types of incidents. Learners are encouraged to explore their own reactions, feelings, and behaviors as they relate to that incident. They should be reflective about what has happened and their involvement, and assess their feelings and behaviors.

Learner Self-Assessment of Writing

Have learners develop a checklist like the one below to help them assess, revise, and edit their writing.

- Are your ideas organized?
- Have you connected your ideas?
- Does your introduction tell the reader the most important information?
- Did you use headings and subheadings where appropriate?
- If appropriate, did you use a conversational tone?
- Did you address the reader directly, not in the third person?
- Did you avoid chains of nouns?
- Are your sentences limited to one idea?
- Did you use unnecessary words?
- Did you use an active, rather than passive, voice?
- Are your sentences less than 25 words?
- Did you avoid double negatives?

Writing Rubric

A rubric is an excellent way to engage learners in self-assessment of their writing, and can be used effectively with writing portfolios.

Score	4	3	2	1
	Demonstrates excellent skills	Demonstrates adequate skills	Demonstrates less than adequate skills	Demonstrates weak skills
Focus	Focus clear.	Focus not clear at every point.	Focus not sustained.	No focus.
Ideas	Well-developed ideas.	Some adequately developed ideas.	Some under-developed ideas.	Ideas not developed.
Organization	Logical flow of ideas.	Ideas not in most effective order.	Order of ideas not effective.	No order.
Grammar, usage, mechanics	Free of errors.	Few errors.	Errors interfere with meaning at some points.	Errors obscure meaning.

Spelling

Misspelling “is still the single most egregious evidence of supposed illiteracy in the eyes of the general public and employers” (Wilde, 1992, p 56).

Why Is Spelling Difficult?

I take it you already know
Of tough and bough and cough and dough?
Others may stumble, but not you,
On hiccough, thorough, lough and through?
Well done! And now you wish, perhaps,
To learn of less familiar traps?
Beware of heard, a dreadful word
That looks like beard and sounds like bird,
And dead: it's said like bed, not bead --
For goodness sake don't call it 'deed!
Watch out for meat and great and threat
(They rhyme with suite and straightand debt).
A moth is not a moth in mother,
Nor both in bother, broth in brother,
And here is not a match for there
Nor dear and fear for bear and pear;
And then there's dose and rose and lose --
Just look them up -- and goose and choose,
And cork and work and card and ward,
And font and front and word and sword,
And do and go and thwart and cart --
Come, come, I've hardly made a start!
A dreadful language? Man alive!
I'd mastered it when I was five!

Author Unknown

Spelling Principles

Principle One: Spelling is learned as we use it

- Provide frequent opportunities to write for a range of purposes and audiences.
- Encourage students' attempts to spell words.
- Let them approximate — especially when they are trying to use new words. Point out the parts they have spelled correctly. Use the parts they have misspelled as a focus for teaching spelling.
- Have students proofread their writing to identify possible spelling errors.

Principle Two: Learning to spell is part of the developmental process of learning to write.

Determine what students already know about spelling and they can then build on that knowledge.

Principle Three: Analyzing spelling errors provides information about how far students have developed their understandings of spelling.

Analysis of errors from students' writing guides understanding of the strategies the students are relying upon as they attempt to spell.

Principle Four: Teaching spelling is an on-going activity.

Whenever students come across new words, they should be encouraged to analyze them and to look at their structure and relate this to word meanings.

Principle Five: Independence and self-evaluation are essential in spelling development.

- Teach proofreading skills and ask students to proofread their work. Get students to underline words they think might not be correct, even when they don't know how to correct the words. Knowing when a word *looks* wrong, is the first step towards getting it right.
- Encourage students to evaluate their own progress, identifying goals achieved and areas that need further work.

- Teach students how to learn words and how to check spelling of words they have attempted.
- Make students aware of processes for trying to write new words.

Principle Six: Effective spellers use a number of different strategies interactively in order to spell correctly. Students need to be explicitly taught a range of strategies in order to internalize them and use them interactively to produce correct spelling.

Research on Spelling Strategies

Research indicates that strategic spellers know their strategies and can describe them, as well as use them. Studies show that successful spelling is a thinking activity, not a rote learning activity. The following strategies are most often used by successful speller:

- Visual strategies that rely on what a word looks like and identifying patterns.
- Phonetic strategies that are based on what words sound like.
- Morphemic strategies that rely on meaning.
- Analogy strategies that consider known words when faced with writing new words.
- Reference strategies that use dictionaries and other resources.

Instructional strategies for spelling differ according to students' spelling development, so it's useful to determine the approximate point of students' spelling development. (Temple, Nathan, Temple, & Burris, 1993; Wilde, 1992). Spelling can be easily assessed within the context of students' writings, and then categorized according to the following taxonomy to obtain an estimate of their developmental spelling level.

- 1 = **Pre-phonemic:** spellers use letters or letter-like symbols to represent language. Random strings of letters, numbers, and other markings may also be used to represent words. These spellers are not usually readers.
- 2 = **Phonemic:** spellers have discovered phonetic principles of spelling and represent only some of the sounds in words, often the first and or last sounds. The goal is to help students learn to represent more sounds until they are able to represent all of the sounds in most words. You can model listening to one syllable in a word at a time, inviting students to listen along and represent all the sounds they hear. Do not give students more information than they can handle.
- 3 = **Letter name:** spellers represents more and more letter sounds until they represent all or most of the sounds in a word, but do so on the basis of letter names; spelling. Research indicates that students will not move from this level to transitional spelling without demonstrating the ability to orally read unfamiliar material with expression and comprehension (Hughes & Searle, 1991). You should provide support, reassurance, and directions, and immerse students in an environment that is rich in print. At this stage, it is important to reinforce the notion that communicating ideas is more important than perfect spelling. When a speller requests help, ask them to think about what the word looks like in books. You might point out that a particular word might sound differently than the way it looks (Bissex, 1980). Give students frequent opportunities to read and write.
- 4 = **Transitional:** as students learn to read they may notice differences between their spellings and conventional spelling in books, and begin to incorporate some of the visual features of standard English orthography into their own spelling. Transitional instruction aims to increase students' expanding knowledge of the regularities of English orthography and the number of words they can spell correctly. These spellers may not have discovered that words with similar meanings tend to have similar spellings (sign, signal). Calling attention to base words and affixes as needed when they edit their writing will help. Another instructional strategy is to collect unconventional spellings from students' work over a period of time and categorize the errors, listing the conventional spelling next to each unconventional spelling (Ganschow, 1981; Marino, 1981). Then, actively involve the student in figuring out the rule.

Adults must learn to pronounce words correctly.

- It's hard to spell the word *strictly* unless they hear the second *t* in the word.
- The words *February* and *library* are also difficult because they of their first *r*.

Have students generate personal spelling lists that emerge from students' own writings and interest. Ask students what words they would like to learn to spell. Give regular, informal spelling tests from the personal list. Do not grade the test. Students should self-correct their own test.

- 5 = **Correct.**

Reference: *Readers and Writers With a Difference, Second Edition, A Holistic Approach to Teaching Struggling Readers and Writers*, Lynn K. Rhodes, Curt Dudley-Marling.

Teaching Learners Spelling Strategies

These basic procedures provide learners with a way to approach any new word they are trying to learn to spell.

To begin with, have learners;

- Look at the word.
- Listen to the beginning sound.
- Write it.
- Identify and listen to rhyming words.
- Write rhyming words.
- Say the word slowly and then fast (to teach segmentation and blending).
- Write the word again.

Then, have learners:

- Think about meaning. Does it give any clues to spelling patterns?
- Say the word slowly and listen carefully.
- Write the word syllable-by-syllable, and make sure that each sound is represented with a letter or letters.
- Look carefully to see if the pattern looks right.
- Try different patterns that might be right.
- Try to think of another word which is similar.

One often-told story tells about a girl who, when asked to spell *fish*, wrote GHOT on the chalkboard. It makes perfect sense, if it's the same *gh* we see in the word *cough*, the same *o* we hear in the word *women*, and the same *t* we hear in the word *nation*.

Sounding Out

Sounding out words as a spelling strategy only works with certain words. Learners who try to rely too completely on the sound of words for hints on how to spell it often have trouble with some of the peculiar sound-spell combinations in the English language. Unfortunately, the ability to sound things out correctly doesn't help much with some words. For example:

- *Wednesday*, which puts an *nz* sound before the *d*.
- Words like *often* and *handsome*, in which the *t* and *d* sounds have disappeared.

Trace, Copy, and Recall Strategy

- List three or four new spelling words in a column.
- Have learners say the first word, trace it saying the letters as they trace, and then say the word again.
- Ask them to copy the word next to the original word.
- Flip the paper over and ask learners to say the word and then spell it.
- If it's a difficult word, you can put it on the list more than once.
- After they've done all the words this way a few times, start doing the words two or three at a time. When they feel they know them, ask learners to do the list again, but skip the tracing or skip both the tracing and the copying.

Use Spelling Words in Short Phrases

If *separate* is the word, see if your learner can think of five different phrases with the word *separate* and write them out. For example, *separate rooms*, *separate cars*, *separate houses*, *A Separate Peace*, etc.

Highlighting the Hard Parts Spelling Technique

This is a very good technique for learning any kind of rules and patterns.

- Get different color pens, pencils, or markers and index cards.
- Have learners write the words vividly and boldly on the cards, making the *hard part* a different color than the rest.
- Ask learners to make a mental picture of that card by reading the word out loud, spelling it out loud, and then changing the way they say the *hard part*, maybe by saying it louder or by using a British accent. Have them think about the *hard part* and what it looks like or sounds like.
- Turn the card over and have them write the whole word.
- Don't let learners try to learn more than one or two words at a time.

Reverse Chaining by Letter Spelling Technique

- Have learners say new spelling word and then write it out at the top of a column, saying each letter. *G I R L*
- Have learners say it again and then skip down a line and write it again—minus the last letter. Have them say the last letter, but not write it. *G I R*
- Have learners say it again and then skip down a line and write it again—minus the last two letters. Have them say the last letter, but not write it. *G I*
- Have learners continue until they're only writing one letter. *G*
- Have them go back to the top, read the word, and then spell it out loud.
- Fold the page over from the top so they can't see the whole word. Have them say the word, spell it, and add that last letter.
- Fold the page over again. Have them say the word, spell it, and add that last two letters.
- Keep going until they spell the whole word.

Reverse Chaining by Syllable Technique

- This is the same process as the *Reverse Chaining by Letter* technique, but more difficult and for longer words.
- Ask learners to say the word, then write it out, saying each letter. *S-E-P-A-R-A-T-E*
- Have learners skip down a line, say it, and write it again—minus the last syllable.
- Have them say the last syllable and spell it out loud, but don't have them write it. *S-E-P-A-*

- Continue until learners aren't writing anything.
- Have learners go back to the top, read the word, and then spell it out loud.
- Fold the page over so they can't see the whole word. Have them say the word, spell it, and add the last syllable.
- Fold the page back again. Have them say the word, spell it, and add the last two syllables.
- Continue until they spell the whole word.

Sparkle Spelling

Have students stand or sit in a circle. Read a word and then ask the first student to say the first letter. The next student says the second letter and so on, until the word is spelled. When students choose the wrong letter, they sit down and are out of the game. This process continues with various words until there is one person left standing—the winner.

Popcorn Spelling

Put students into teams and give them cards with letters. Have each team, one at a time, decide how to spell a word and put their letter cards on the board accordingly. The other teams can challenge if they feel the word is spelled incorrectly. If the word is spelled correctly, the team receives a point. If not, the challenging team receives a point. Go over the basic rules of spelling as a fun way to reinforce and review them.

Use of Mnemonics

Mnemonics are mental tricks that will help learners remember how to spell words. For example:

- PIEce of PIE.
- There is a LIE in believe.
- Wherever there's a Q there is U, too.
- Because: Bunnies Eat Carrots And Uncle Sam's Eggs.
- Friend: Fri the End.
- Knife: k - nif - e.
- Teacher: There is an ACHE in every teacher.
- Accommodation: There are two caravans and two motels.
- Island: An island is land.
- Stationary/stationery: A car is stationary.
- Meat/meet: I like to eat meat.

Learning Preferences and Spelling

- Look and say the word (visual)
- Chant the spelling (auditory)
- Write the word (kinesthetic)
- Trace over the word (kinesthetic)

Words within Words

Words within words are when little words can be found inside big words. Remembering the little words will help to remember the big words. For example:

- Father - fat, her, he
- Believe - be, lie, eve
- Football - foot,, all, ball
- Forget - for, or, get, forge
- Hotdog - hot, do, dog

Have learners see how many new words they can find within the word *INFORMATION*.

Look, Say, Cover, Write, Check

Students look at the word, visualize in their mind, say it, and then cover it before writing it from memory.

Students are trained to look at the part of the word they find difficult to remember when writing. This part can be written in a different color to bring students' attention to it.

Helpful spelling hints for learners:

- Picture the word in your head.
- Paint the word on your eyelids.
- Paint the word on an easel in your head, used yellow/red.
- Look at the word, and then say the letters/sounds as you write the word.
- Break the word into syllables
- Look closely at the tricky parts.
- Practice the word by writing with your finger on your other hand.

Spelling Journals and Individual Spelling Lists

Use spelling journals or spelling lists as a way of organizing students' learning about words. Words are added on an ongoing basis. The journal page provides a space for: writing words in syllables, highlighting letter patterns or features, and identifying base words.

Students can group words:

- According to sounds: *or, oor, ore, au, aw*.
- According to visual patterns: *ea — bread, great, seam*;
- In alphabetical order.
- According to syllables, letters, prefixes, suffixes.
- By words with short vowel sounds or long vowel sounds.

Words that are consistently spelled incorrectly can be marked with a **T** for transfer. These words are written at the bottom of the list to be included for further practice.

Collections of Words

Have students collect words from different sources (literature, sports publications, recipes, travel brochures, workplace manuals, medical materials, etc.) and chart them.

Search for words based on how they look (patterns), how they sound, or what they mean.

- Words that end with *ment*
- Words that end with *tion*
- Words that begin with *pre*

- Words that rhyme
- Words that mean the same thing
- Words that refer to a place
- Words that refer to a time

Connection Strategies

Human beings have categories for words in their head. As they meet unfamiliar words, they connect the unfamiliar words to those categories. You need to help students expand the categories by making connections among words and drawing out important principles that they know.

One useful strategy to assist students make links between the words they are learning and those already known is outlined in the following chart.

Words that sound like it	← Spelling word →	Words that look like it

Adapted from Fountas, I & Pinnell, G (1998) *Word matters: teaching phonics and spelling in the reading/writing classroom* Heinemann.)

Practice

Tell learners that practice makes spelling permanent, if they're practicing it right. Each time they spell a word wrong, they're practicing the wrong spelling. So, if they're not sure how to spell the word, they need to find out and then practice that spelling.

- Have learners keep an ongoing notebook of words, so they've got their own personal dictionary and they can see their progress.
- Warn learners not to try to learn all the words at once. Have learners practice words a few at a time. Find out what works best for them -- it may be one or two words or as many as three or four. Then, add another word to their list, or start on different ones. Each time they learn another word, have them go back and practice the ones they learned before it.
- Encourage learners to use the words they've practiced, which is the point to learning them. Have learners keep a list of words they're learning in a notebook where they can look them up to make sure they're spelling them right.

Using Spell-checkers

Spell-checkers are capable of discovering misspelled words, and most of them will suggest alternative spellings, but show learners how spell-checkers won't always catch a wrong word. For example, when your learners wanted to write the word *know* but they used the word *no* by mistake or when they meant to use the word *learn* but actually typed *lean*.

I have a spell checker, It came with my PC,
 It plane lee marks four my revue Miss steaks aye can knot sea.
 Eye ran this poem threw it, Your sure reel glad two no
 It's vary polished in it's weigh, My checker tolled me sew.
 A checker is a bless sing, It freeze yew lodes of thyme,
 It helps me right awl stiles two reed, And aides me when aye rime.
 To rite with care is quiet a feet, Of witch won should be proud,
 And wee mussed dew the best wee can, Sew flaws are knot aloud.
 And now bee cause my spelling Is checked with such grate flare,
 There are know faults with in my cite, Of none eye am a wear.
 Each frays come posed up on my screen Eye trussed to bee a joule
 The checker poured o'er every word To cheque sum spelling rule.
 That's why aye brake in two averse My righting once too please,
 Sow now ewe sea why aye dew prays Such soft wear for pea seas!
 Author Unknown

Using a Dictionary

Dictionaries are available online, as well as in various print formats. There are also digital dictionaries. Some dictionaries have nothing but spelling, others offer much more information about words. Remind learners that the important thing about owning any kind of dictionary is that they must have it immediately at hand when they are writing or reading.

- Write the alphabet down the side of the page and have learners find a word for each letter and the meaning.
- Say aloud a letter and have the student to see how quickly they can find it in the dictionary.

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