

United States Army Aviation Center
Fort Rucker, Alabama
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STUDENT HANDOUT

TITLE: INSTRUCTING FUNDAMENTALS FOR THE INSTRUCTOR PILOT

FILE NUMBER: 1J/3K/4H/4L/7A/7C/33/41/48/55/67/71/84-0680-4

PROPONENT FOR THIS LESSON PLAN IS:

Aviation Training Brigade
ATTN: ATZQ-ATB-HHC
Fort Rucker, Alabama 36362-5000

FOREIGN DISCLOSURE STATEMENT: The materials contained in this course have been reviewed by the course developer in coordination with the USAAVNC foreign disclosure authority. This course is releasable to foreign military students without restriction.

NOTES

TERMINAL LEARNING OBJECTIVE:

At the completion of this lesson the student will:

ACTION: Instruct flight procedures.

CONDITION: While serving as an Instructor Pilot.

STANDARD: In accordance with (IAW) the Instructor Pilot's Handbook.

SAFETY REQUIREMENTS: None.

RISK ASSESSMENT LEVEL: Low.

ENVIRONMENTAL CONSIDERATIONS: None.

EVALUATION: Each student will be evaluated upon completion of the last scheduled hour. It will be a 50-minute exam consisting of 30 multiple-choice questions. The test will be given in this classroom.

A. ENABLING LEARNING OBJECTIVE (ELO) #1:

ACTION: Identify the elements involved in the learning process.

CONDITION: In a training situation.

STANDARD: IAW the Instructor Pilot's Handbook.

Learning Step/Activity - Provide instruction on the elements involved in the learning process.

a. Definition of learning.

(1) The ability to learn is one of humanity's most outstanding characteristics. Learning occurs continuously throughout a person's lifetime.

(2) To define learning, it is necessary to analyze what happens to the individual.

(3) As a result of a learning experience an individual's way of perceiving, thinking, feeling, and doing may change. Thus, learning can be defined as a change in behavior as a result of experience.

b. Characteristics of learning.

(1) Learning is purposeful.

(a) Each student sees the learning situation from a different viewpoint. Past experiences affect readiness to learn and understand the requirements involved.

(b) Their individual needs and attitudes may determine what they learn as much as what the instructor is trying to get them to learn.

(c) Purposes are goals established to meet certain desires. Students learn from any activity that tends to further their purposes.

(2) Learning comes through experience.

(a) Learning is an individual process and the instructor cannot do it for the student. All learning comes from individual experiences.

(b) If students are to use sound judgment and solve problems, they must have had learning experiences in which they have exercised judgment and applied their knowledge of general principles in their solving of realistic problems.

(3) Learning is multifaceted.

(a) A class learning to apply the scientific method of problem solving may learn the method by trying to solve real problems. In doing so, will also be engaging in "verbal learning" and sensory perception at the same time.

(b) While learning the subject at hand, the student may be learning other things as well. For example, they may be developing attitudes (good or bad) about aviation, depending on what they experience.

(4) Learning is an active process.

(a) The instructor cannot assume that students remember something just because they were present in the classroom, shop, or airplane when the instructor taught it. Neither can the instructor assume that the students can apply what they know because they can quote the correct answer from the book.

(b) For the students to learn, they must react and respond outwardly, inwardly, emotionally, or intellectually. But if learning is a process of changing behavior, clearly that process must be an active one.

c. Learning Styles.

(1) This is a concept that can play an important role in improving instruction and student success. It is concerned with student preferences and orientation at several levels. Students are different, and instructors should be sensitive to the differences. Instructors who can recognize student learning style differences and associated problems will be much more effective than those who do not understand this concept. They will be better prepared to develop appropriate lesson plans and provide guidance, counseling and other advisory services, as required.

(2) Any number of adjectives may be used to describe learning styles. Some common examples include:

(a) Right/left brain. In general, those with right-brain dominance are characterized as being spatially oriented, creative, intuitive, and emotional. Those with left brain dominance are more verbal, analytical, objective. However, they do not function independently.

(b) Visual/auditory. Learning style depends on how students process information. Some rely heavily on visual references while others more on auditory presentations. Visual students learn readily through

reading, and auditory students have more success if they hear the subject matter described.

(c) Holistic/serialist. The holist strategy is a top-down concept where students have a big picture perspective. These students seek overall comprehension, especially through analogies. The serialist student focuses more narrowly and needs well-defined, sequential steps where the overall picture is developed slowly, thoroughly, and logically. This is a bottom-up strategy.

(d) Dependent/independent. Dependent students require a lot of guidance, direction, and external stimulation. These students focus on the instructor. Independent students require only a minimum amount of guidance and are not concerned with how the lesson is presented.

(e) Reflective/impulsive. Students with reflective-type personality tend to be uncertain in problem-solving exercises. Impulsive students dive right in with enthusiasm and are prone to make quick, and sometimes faulty, decisions.

d. Principles of learning.

(1) Readiness.

(a) People learn best when they are ready to learn, and they do not learn much if they see no reason for learning.

(b) If students have a strong purpose, a clear objective, and a well-fixed reason for learning something, they make more progress than if they lack motivation.

(2) Exercise.

(a) Students do not learn to weld during one shop period or to perform a flight maneuver during one instructional flight. Those things most often repeated are best remembered.

(b) Students learn by applying what they have been told and shown. Every time practice occurs, learning continues.

(3) Effect.

(a) This law is based on the emotional reaction of the learner that states that learning is strengthened when accompanied by a pleasant or satisfying feeling, and that learning is weakened when associated with an unpleasant feeling.

(b) Impressing students with the difficulty of an aircraft maintenance problem or maneuver can make the teaching task difficult. Usually it is better to tell students that a problem or maneuver, although difficult, is within their ability to understand or perform.

(c) Whatever the learning situation, it should contain elements that affect the students in a positive way and give them a feeling of satisfaction.

(4) Primacy.

(a) Primacy, the state of being first, often creates a strong, almost unshakable, impression; therefore, what is taught must be right the first time.

(b) For the student, this means that learning must be right from the beginning. The first experience should be positive, functional, and lay the foundation for all that is to follow.

(5) Intensity.

(a) A vivid, dramatic, or exciting learning experience teaches more than a routine or boring experience. A student is more likely to gain a greater understanding of stalls or autorotations by performing them than from merely reading about them.

(b) In contrast to flight instruction, the classroom imposes limitations on the amount of realism that can be brought into teaching. The instructor should use imagination in approaching reality as closely as possible.

(6) Recency.

(a) Things most recently learned are best remembered. The further a student is removed timewise from a new fact or understanding, the more difficult it is to remember.

(b) Instructors recognize the law of recency when they carefully plan a summary for a ground school class or a postflight critique.

(c) The instructor repeats, restates, or reemphasizes important matters at the end of a lesson to make sure that the student remembers them.

d. How people learn.

(1) Perceptions. Initially, all learning comes from perceptions which are directed to the brain by one of more of the five senses: approximately 75-percent sight, 13-percent sound, 6-percent touch, 3-percent smell and 3-percent through taste. Learning occurs most rapidly when information is received through more than one sense.

(a) Perceiving involves more than the reception of stimuli from the five senses. Perceptions result when a person gives meaning to sensations. The meanings that are derived from perceptions are influenced not only by the individual's experience, but also by many other factors.

(b) "Mother Nature" provides us with built-in devices of physical reaction such as blinking at an arc welder, flinching from an electrical shock, etc. We also have psychological devices that affect our interpretation of basic perceptions. This is seen most often in the different viewpoints taken by two people observing the same thing. Factors which affect perception are:

1. Physical Organism. Provides individuals with the perceptual apparatus for sensing the world around them. A person whose perceptual apparatus distorts reality is denied the right to fly.

2. Basic Need. A person's basic need is to maintain and enhance their organized self. A person's most fundamental, pressing need is to preserve and perpetuate the self. Their perceptual devices will be very receptive to information that can affect their well being. Psychologically, we are what we perceive.

3. Goals and Values.

a. Beliefs and values color every experience and sensation that is funneled into one's central nervous system. The precise kinds of commitments and philosophical outlooks that the student holds are important for the instructor to know, since this knowledge will assist in predicting how the student will interpret experiences and instructions.

b. People pursue those things that are highly valued; they do not seek out those things considered unimportant.

4. Self-Concept.

a. A student's self-image, described in terms as confident and insecure, has a great influence on the perceptual process. Experiences that support a favorable self-image make them more receptive to instruction; if experiences tend to contradict their self-image, they may reject additional training.

b. A negative self-concept inhibits the perceptual process by introducing psychological barriers. Students who view themselves positively are less defensive and more receptive to new experiences, instructions, and demonstrations.

5. Time and Opportunity. Learning some things must be based on earlier perceptions and will require time to relate to the new. Thus, sequence and time are necessary. In general, lengthening an experience and increasing its frequency are the most obvious ways to speed up learning, although this is not always effective. Many factors, in addition to the length and frequency of training periods affect the rate of learning.

6. Element of Threat.

a. The element of threat does not promote effective learning. Fear adversely affects a student's perception by narrowing the perceptual field. Normal student reaction to a threat is to focus all perceptual faculties on the thing generating the fear.

b. Anything an instructor does that is interpreted as threatening makes the student less able to accept the experience the instructor is trying to provide. It adversely affects all the student's physical, emotional, and mental faculties.

c. Learning is a psychological process, not necessarily a logical one. Trying to frighten a student may seem logical but is not effective psychologically. The effective instructor can organize teaching to fit the psychological needs of the student.

(2) Insights.

(a) Insights involve the grouping of perceptions into meaningful wholes. Creating insight is one of the instructor's major responsibilities. It is essential to help the student realize the way each piece relates to all other pieces of the total pattern of the task to be learned. This mental relating and grouping of associated perceptions is called insight.

(b) Developing student insights. Although insights will develop on their own (trial and error), the instructor can speed up the process by teaching the relationship of perceptions as they occur thus promoting the development of the student's insight.

(c) Relation of insight to memory. As perceptions increase in number and are grouped into more meaningful wholes, they provide more anchor points for retention. Forgetting is less of a problem when there are more anchor points for tying insights together.

(d) Pointing out the relationships as they occur, providing a secure and nonthreatening environment, and helping a student acquire and maintain a favorable self-concept are key steps in fostering the development of insight.

(3) Motivation.

(a) Motivation is probably the most dominant force that affects a student's progress and ability to learn. It may be negative or positive, tangible or intangible, subtle and difficult to identify, or it may be obvious. Positive motivation is essential to true learning.

(b) Negative motivation may engender fear, and be perceived as a threat. It may be useful in certain situations; characteristically it is not as effective in promoting efficient learning as positive motivation. Negative motivation in the form of reproofs or threat should be avoided with all but the most overconfident or impulsive student.

(c) The promise or achievement of rewards provides positive motivation. Motivation that can be used to advantage by the instructor includes the desire for personal gain, the desire for personal comfort and security, the desire for group approval, and the achievement of a favorable self-image.

1. Personal Gain. The desire for personal gain, either the acquisition of possessions or status, is a basic motivational factor. An individual may be motivated to dig a ditch or to design a supersonic airplane solely by desire for personal gain.

a. For motivation to be effective, students must believe that their efforts will be suitably rewarded. These rewards must be constantly apparent to the student during instruction.

b. Lessons often have objectives that are not obvious at first. It is important for the instructor to make the student aware of those applications that are not immediately apparent.

2. Comfort and Security. The desire for personal comfort and security is a form of motivation which instructors often forget. All students want secure, pleasant conditions and a safe environment. If they recognize that what they are learning will promote these objectives, their attention is easier to attract and hold. Insecure and unpleasant training situations inhibit learning.

a. Everyone wants to avoid pain and injury.

b. The attractive features of the activity to be learned can be a strong motivational factor. If they understand that each task will be useful in preparing for future activities, they will be more willing to pursue it.

3. Group Approval. Another strong motivating force is group approval. Every person wants the approval of peers and supervisors.

a. Interest can be stimulated and maintained by building on this natural desire.

b. Most students enjoy belonging to a group and are interested in accomplishments that will give them prestige within the group.

4. Self-Image. People seek to establish a favorable self-image. Basically, anyone who begins any task has a belief that with normal circumstances existing they can succeed. These beliefs in the student's own ability is a strong motivating force.

a. An instructor can effectively foster this motivation by the introduction of perceptions that are solidly based on previously factual information.

b. This promotes student confidence in the overall training program and, at the same time helps the student develop a favorable self-image. As this confirmation progress and confidence increases, advances will be more rapid and motivation will be strengthened.

(4) Levels of learning. Learning may be accomplished at any of four basic levels

(a) Rote. The lowest level of learning is the ability to repeat something that one has been taught without understanding or being able to apply what has been learned.

(b) Understanding. With proper instruction on the effect and use of flight controls, and experience in controlling the aircraft during straight-and-level flight, the student can consolidate these old and new perceptions into an insight on how to accomplish a turn. At this point, the student has developed an understanding that is basic to learning, but may not necessarily enable the student to make a correct turn on the first attempt.

(c) Application. When a student understands the procedure for entering a turn, has the procedure demonstrated, and has practiced the procedure until consistency has been achieved, the student has developed the skill to apply what has been learned.

(d) Correlation. This is the objective of aviation instruction. It is that level at which the student is able to associate an element that has been learned with other segments or blocks of learning. The student who has achieved this level of learning in turn entries, for example, has developed the ability to correlate the elements of turn entries with entry into a holding pattern.

(5) Domains of learning. These classifications consider what is to be learned. Is it knowledge only, a change in attitude, a physical skill, or a combination of knowledge and skill? One of the more useful categorizations of learning includes three domains:

(a) Cognitive. Refers to knowledge that might be gained as a result of attending a ground school, reading about aircraft systems, or listening to a preflight brief.

(b) Affective. May be the least understood, and in many ways, the most important. Since it is concerned with attitudes, personal beliefs, and values, evaluating this domain is not easy.

(c) Psychomotor. Physical skills always have been important in aviation. Typical activities involving these skills include learning to fly a precision instrument approach procedure, or using a sophisticated piece of equipment. As physical tasks and equipment become more complex, the requirements of both cognitive and physical skills increase.

f. Learning Physical Skills. The main objective or purpose of most instruction is teaching a concept, a generalization, an attitude, or a skill. The process of learning a physical (psychomotor) skill is much the same as a mental (cognitive) skill. Physical skills involve more than muscles.

(1) Desire to Learn. Students learn more readily those skills that appeal to their own needs (principle of readiness). Conversely, where the desire to learn or improve was missing, little progress was made. The student who lacks the desire to improve is not likely to make the effort and consequently will continue to practice errors. The skillful instructor relates the lesson objective to the student's intentions and needs and, in so doing builds on the student's natural enthusiasm.

(2) Patterns to Follow. The best way to prepare the student to perform a task is to provide a clear, step-by-step example. Having a model to follow permits students to get a clear picture of each step in the sequence so they understand what is required and how to do it.

(3) Perform the Skill. Even demonstrating a specific skill would not result in that person learning how to perform that skill. Obviously, practice is necessary. There is another benefit of practice. As the student gains proficiency in a skill, verbal instructions mean more.

(4) Knowledge of Results. In learning some simple skills, students can discover their own errors. In other cases, such as learning complex flight maneuvers mistakes are not always apparent. They may know something is wrong, but not know how to correct it. The instructor provides a helpful and often critical function in making certain that the students are aware of their progress in a timely manner.

(5) Progress Follows a Pattern. The process of learning skills follows a pattern. The expected learning pattern would be a continuous increase in knowledge or skill with each period of instruction. In most cases, however, it follows a somewhat different path. Graphs of the progress of skill learning usually follow the same pattern. There is rapid improvement in the early trials; then, the curve levels off and may stay level for significant periods of effort. Further improvement may seem unlikely. This leveling off is normal and should be expected. Learning has not necessarily ceased. Such a development is a learning plateau and may signify any number of conditions.

- (a) Learner may have reached capability limits.
- (b) Learner may be consolidating level of skill.
- (c) Learner's interest may have waned.
- (d) Learner may need a more efficient method for increasing progress.

(6) Evaluation versus Critique. In the initial stages, practical suggestions are more valuable to the student than a grade. Early evaluation is usually teacher oriented. It provides a check on teaching effectiveness, can be used to predict eventual student learning proficiency, and can help the teacher locate special problem areas. The observations on which the evaluations are based also can identify the student's strengths and weaknesses, a prerequisite for making constructive criticism.

(7) Application of Skill. The final and critical question is can the student use what has been learned? To answer this question, two conditions must be present.

(a) The student must learn the skill so well that it becomes easy, even habitual.

(b) The student must recognize the types of situations where it is appropriate to use the skill. This involves the question of transfer of learning.

g. Memory. Memory is an integral part of the learning process. Although there are several theories on how memory works, a widely accepted view is the multi-stage concept. This concept states that memory includes three parts: *sensory, working or short-term, and long-term systems*. The total system operates somewhat like an advanced computer.

(1) Sensory Register. The sensory register receives input from the environment and quickly processes it according to the individual's preconceived concept of what is important. It processes inputs or stimuli within seconds, discards what is considered extraneous and processes what is determined to be relevant. This selective process where the sensory register is set to recognize certain stimuli and immediately transmit them to the working memory is called precoding.

(2) Working or Short-term Memory. Within in seconds the relevant information is passed to the working or short-term memory where it may temporarily remain or rapidly fade depending on the individual's priorities. Several steps help in retention in the short-term memory.

(a) Rehearsal or repetition of the information.

(b) Coding. Sorting or categorization into systematic chunks.

1. The sorting process is time limited. The working memory takes 5-10 seconds to properly code information. If the coding process is interrupted, that information is lost after about 20 seconds. The time limitation may be overcome by rehearsal.

2. The working memory also has limited capacity, usually about seven bits or chunks of information.

3. Methods of coding vary with subject matter, but typically they include some type of association. Use of rhymes or mnemonics is common. Variations of the coding process are practically endless. Developing a logical strategy for coding is a significant step in the learning process.

(3) Long-term Memory. This is where information is stored for future use. For information to be useful, some special effort must have been expended during the coding process in working or short-term memory. The coding should have provided meaning and connections between old and new information. If initial coding is not properly accomplished, recall will be distorted. It is also subject to limitations such as time, biases, and in many cases personal inaccuracies.

(a) Memory also applies to psychomotor skills. Long-term memory allows a task to be accomplished with very little thought. For the pilot, the ability to instinctively perform certain maneuvers or other tasks that require manual dexterity and precision provides obvious benefits.

(b) One of the major responsibilities of the instructor is to help students use their memories effectively. An associated phenomenon, forgetting cannot be ignored.

(4) Theories of Forgetting. A consideration of why people forget may point the way to help them remember. Several theories account for forgetting including:

(a) Disuse. The theory of disuse suggests that people forget those things that are not used.

(b) Interference. One theory holds that people forget something because a certain experience has overshadowed it or that the learning of similar things has intervened. Closely similar material seems to interfere with memory more than dissimilar material. Material not well learned suffers most from interference.

(c) Repression. Material that is unpleasant or produces anxiety may be unintentionally submerged into the unconscious mind. It is not intentional, but subconscious and protective.

(5) Retention of Learning. Each of the above theories implies that when a person "forgets" something, it is not actually lost rather, it is unavailable for recall. The instructor's problem is how to make certain that

the student's learning is available for recall. The following suggestions can help recall.

(a) Teach thoroughly and with meaning. Material thoroughly learned is highly resistant to forgetting. Meaningful learning builds patterns of relationship in the student's consciousness. It involves principles and concepts anchored in the student's own experience. Rote learning is superficial and is not easily retained.

(b) Use the Five Principles of Remembering.

1. Praise Stimulates Remembering. Responses that give a pleasurable return tend to be repeated.

2. Recall is Promoted by Association. Each bit of information or action that is associated with something to be learned tends to facilitate its later recall.

3. Favorable Attitudes Aid Retention. People learn and remember only what they wish to know. Without motivation there is little chance for recall. Positive motivation is most effective.

4. Learning with All of Our Senses is Most Effective. When several senses respond together, a fuller understanding and greater chance of recall is achieved.

5. Meaningful Repetition Aids Recall. Each repetition gives the student an opportunity to gain a clearer and more accurate perception, but mere repetition does not guarantee retention. Some research indicates that three or four repetitions provide maximum effect, after which the rate of learning and probability of retention fall off rapidly.

(c) Retention during a typical academic lesson.

1. After the first 10-15 minutes, the rate of retention drops significantly until the last 5-10 minutes when the students wake up again.

2. Students passively listening to a lecture have roughly five-percent retention rate over a 24-hour period, but students actively engaged in the learning process have a much higher retention.

h. Transfer of Learning. During a learning experience, things learned previously may aid the student (positive habit transfer). On the other hand, it is sometimes apparent that previous learning interferes with the current learning task (negative habit transfer).

(1) Consider the learning of two skills, A and B. If the learning of A helps to learn B, positive habit transfer occurs. If learning A hinders the learning of B negative transfer occurs. For instance, the practice of slow flight (A) helps the student learn short field landings (B), whereas practice in making a landing approach in an airplane (A) may hinder learning to make an approach in a helicopter (B).

(2) Many aspects of teaching profit by this type of transfer. It may explain why students of apparently equal ability may have differing success in certain areas. Negative transfer may hinder the learning of some;

positive transfer may help others. This points to a need to know a student's past experience and what has already been learned.

(3) The cause of transfer and how it operates has not yet been identified and explained. No one disputes the fact that transfer does occur. The significance of this ability for the instructor is that the student can be helped to achieve it. The following suggestions will help in achieving positive transfer of learning.

(a) Plan for transfer as a primary objective.

(b) Make certain that the students understand that what is learned can be applied to other situations.

(c) Maintain high-order of learning standards. The more thoroughly the students understand the material, the more likely they are to see its relationship to new situations. Avoid unnecessary rote learning since it does not foster transfer.

(d) Use materials that make relationships clear.

(4) Habit formation.

(a) The formation of correct habit patterns from the beginning in any learning process is essential to further learning and for correct performance after completion of training.

(b) Primacy is one of the fundamental principles of learning. Therefore, it is the instructor's responsibility to insist on correct techniques and procedures from the beginning of training to provide proper habit patterns.

(c) The importance of establishing correct habit patterns cannot be overemphasized. It is far easier to establish correct patterns than to try to correct faulty patterns later on.

(d) Building Block Concept. Due to the high level of knowledge and skill required in aviation, training traditionally has followed the building block concept. This means that new learning and habit patterns are based on a solid foundation of experience/or old learning. As knowledge and skill increase, there is an expanding base upon which to build for the future.

B. ENABLING LEARNING OBJECTIVE (ELO) #2:

ACTION: Select the elements of human behavior essential to the learning process.

CONDITION: In a training situation.

STANDARD: IAW the Instructor Pilot's Handbook.

Learning Step/Activity - Provide instruction on the elements of human behavior essential to the learning process.

a. Control of Human Behavior.

(1) The relationship between the instructor and student has a profound impact on how much the student learns. The instructor's understanding of the student's needs, goals, and defense mechanisms used are elements of human behavior that are essential to the learning process.

(2) To the students, the instructor usually is a symbol of authority. Students expect instructors to exercise certain controls, and they recognize and submit to authority as a valid means of control. The instructor's challenge is to know what controls are best for what circumstances.

(3) Every student works toward a goal of some kind. The successful instructor directs and controls the behavior of the students and guides them toward a goal. Without the instructor's active intervention the student may become passive and perhaps resistant to learning.

(4) How to mold a solid, healthy, productive relationship with students depends, of course, on the instructor's knowledge of students as human beings and of the needs, drives, and desires they continually try to satisfy in one way or another.

b. Human Needs. The needs of students and of all mankind, have long been studied by psychologists and categorized in a number of ways. During the 1950s, Abraham Maslow organized human needs into levels of importance. They are referred to as a hierarchy of human needs.

(1) Physical. Physical needs are at the broadest level of the pyramid of human needs. The student will be more receptive to what is being taught if these needs are being met. Once a need is satisfied, it no longer provides motivation. Thus, the person strives to satisfy the needs of the next higher level.

(2) Safety. Safety needs are protection against danger, threat, and deprivation. They are real and influence student behavior. This is especially true in flight training where safety is a major concern.

(3) Social. When individuals are physically comfortable and do not feel threatened they seek to satisfy their social needs. These are to belong, to associate, and to give and receive friendship and love. Since students are out of their normal surroundings during flight training their need for association and belonging is more pronounced.

(4) Ego. The egoistic needs usually have a strong influence on the student-instructor relationship. Those that relate to one's self-esteem and those that relate to one's reputation are two kinds. The egoistic need may be the main reason for a student's interest in aviation.

(5) Self-fulfillment. Self-fulfillment needs should offer the greatest challenge to the instructor. Aiding another in realizing self-fulfillment is perhaps the most rewarding accomplishment for an instructor. It is considered the apex of the hierarchy of human needs.

c. Defense Mechanisms. In general, defense mechanisms are subconscious, almost automatic, ego-protecting reactions to unpleasant situations. People use these defenses to soften feelings of failure, to

alleviate feelings of guilt, and to protect their sense of personal worth or adequacy. It may be difficult for an instructor to identify excessive reliance on defense mechanisms by a student. Physical symptoms such as a change in personality, angry outbursts, depression and a general lack of interest may point to a problem. A perceptive instructor can help by using common sense and talking over the problem with the student. The main objective is to restore motivation, and self-confidence.

(1) Compensation. With compensation, students often attempt to disguise the presence of a weak undesirable quality by emphasizing a more positive one. They also may try to reduce tension by accepting and developing a less preferred but more attainable objective instead of a more preferred but less attainable objective.

(2) Projection. With projection, students relegate the blame for their own shortcomings, mistakes, and transgressions to others or attribute their motives, desires, characteristics and impulses to others.

(3) Rationalization. Rationalization is a subconscious technique for justifying actions that otherwise would be unacceptable. When true rationalization takes place, individuals sincerely believe in their excuses.

(4) Denial of Reality. Occasionally students may ignore or refuse to acknowledge disagreeable realities.

(5) Reaction Formation. Sometimes individuals protect themselves from dangerous desires by not only repressing them, but also actually developing conscious attitudes and behavior patterns that are just the opposite.

(6) Flight. Flight is an escape from frustrating situations, by taking flight, physical or mental. To take flight physically, students may develop symptoms or ailments that give them excuses for removing themselves from frustration. Daydreaming is an example of mental flight.

(7) Aggression. Anger is a normal universal human emotion. Angry people may shout, swear, slam a door, or give in to the heat of emotions in a number of ways. Students in an aviation environment are taught to repress their emotions in the interest of safety. Because of safety concerns, student aggressiveness may be expressed in subtle ways. They may ask irrelevant questions, refuse to participate in the activities of the class, or disrupt activities within their own group.

(8) Resignation. Students may become so frustrated that they lose interest and give up. The most obvious and apparent cause for this form of resignation takes place when, after completing an early phase of a course without grasping the fundamentals, a student becomes bewildered and lost in the more advanced phases.

d. The Flight Instructor as a Practical Psychologist. While it is obviously impossible for every flight instructor to be an accomplished psychologist there are a number of additional considerations which will assist in learning to analyze students before and during each lesson.

(1) Anxiety is probably the most significant psychological factor affecting flight instruction. It is a "state of mental" uneasiness arising from fear. This can be fear of anything real or imagined.

(a) Responses to anxiety vary extensively. They range from a hesitancy to act to the impulse to do something even if it's wrong.

(b) Emphasizing the benefits and pleasurable experiences of flying, rather than continuously citing the unhappy consequences of faulty performance can minimize student anxieties.

(c) An effective technique is to treat fears as a normal reaction, rather than ignoring them. Instructors should introduce certain flight maneuvers with care, so that the students know what to expect, and what their reactions should be.

(2) Both normal and abnormal reactions to anxiety are of concern to the flight instructor. The normal reactions are significant because they indicate a need for special instruction to relieve anxiety. The abnormal reactions are even more important because they may signify a deep-seated problem.

(a) Normal Reaction to Stress. Normal individuals begin to respond rapidly and exactly, within the limits of their experience and training. Many responses are automatic, which points out the need for proper training in emergency procedures.

(b) Abnormal Reaction to Stress. Flight instructors observe students when the "pressure is on". They are in a position to differentiate between a safe and unsafe piloting actions. The following student reactions are indicative of abnormal reactions to stress:

1. Inappropriate reactions, such as extreme over cooperation, painstaking self-control, inappropriate laughter, or singing, very rapid changes in emotions.

2. Marked changes in mood on different lessons, such as excellent morale followed by deep depression.

3. Severe anger directed toward the flight instructor, service personnel, and others.

(c) Flight Instructor Actions Regarding Seriously Abnormal Students. A flight instructor who believes a student is suffering from a serious psychological abnormality has the personal responsibility of assuring that such a person does not continue flight training. To accomplish this, the following steps are available:

1. Arrangements should be made for another instructor, who is not acquainted with the student to conduct an evaluation flight. After the flight the two instructors should confer to determine if further action is justified.

2. An informal discussion should be initiated with Flight Standards, suggesting that the student may be able to meet the skill standards, but may be unsafe psychologically.

3. A discussion should be held with a Flight Surgeon to obtain advice and to decide on the possibility of further examination of the student.

C. ENABLING LEARNING OBJECTIVE (ELO) #3:

ACTION: Write the elements of effective communication.

CONDITION: In a training situation.

STANDARD: IAW the Instructor Pilot's Handbook.

Learning Step/Activity - Provide instruction on the elements of effective communication.

a. Basic Elements. Communication takes place when one person transmits ideas or feelings to another person or group of people. Its effectiveness is measured by the similarity between the idea transmitted and the idea received. The process of communication is composed of three elements:

(1) Source. The source is the sender or communicator. Instructors must exercise great care to make certain that they communicate with ideas and feelings that are meaningful to the students. Use of technical language will always be necessary, but the student must be taught the language first. Instructors assume an obligation to assess their student's knowledge and to use it as a fundamental guide for the selection and transmittal of ideas.

(2) Symbol. Communication is achieved through symbols that are simple oral and visual codes. The words in the vocabulary constitute a basic code. Common gestures and facial expressions form another, but words and gestures alone do not communicate ideas. They should be combined into units that mean something to the student.

(3) Receiver. The receiver is the listener, reader, or student. Instructors should always keep in mind that communication succeeds only in relation to the reaction of their students. When students react with understanding and change their behavior according to the intent of the instructor, effective communication has taken place. For the instructor to change the behavior of the students, some of the students' abilities, attitudes, and experiences need to be understood.

(a) Abilities. Students come to aviation training with a wide variety of abilities. Some may be familiar with aviation in some form while others barely know what an aircraft looks like. The instructor needs to determine the abilities of the students and to understand the students in order to properly communicate.

(b) Attitudes. The attitudes students exhibit may indicate resistance, willingness, or passive neutrality. To gain and hold the student's attention, attitudes should be molded into forms that promote reception of information.

(c) Experiences. The student's experience, background, and education level will determine the approach an instructor will take. A student's education will certainly affect the instructor's style of presentation, but that style should be based on the evaluation of the student's knowledge of the aviation subject being taught.

b. Barriers to Communication. It is essential to understand the dynamics of communication, but the instructor needs to be aware of several barriers to communication that can inhibit learning.

(1) Lack of Common Experience. The lack of common experience between instructor and student is probably the greatest single barrier to effective communication. Words are stimuli that the communicator sets forth to arouse a response in the receiver. An instructor's words cannot communicate the desired meaning to a student unless the student has had some experience with the objects or concepts to which these words refer. If the instructor's terminology is necessary to convey ideas, some time needs to be spent making certain the students understand the terminology.

(2) Confusion Between the Symbol and the Symbolized Object. Languages abound with words that mean different things to different people. Confusion results when a word is confused with what it is meant to represent. To communicate effectively, instructors should be aware of these differences.

(3) Overuse of Abstractions. Abstract words stand for ideas that cannot call forth mental images in the minds of the students. The word aircraft is an abstract word. It does not call to mind a specific aircraft in the imaginations of various students.

(a) Abstractions should be avoided in most cases, but there are times when abstractions are necessary and useful. Aerodynamics is applicable to all aircraft and is an example of an abstraction that can lead to understanding aircraft flight characteristics.

(b) The danger of abstractions is that they will not evoke the same specific items of experience in the minds of the students that the instructor intends. When abstract terms are used, they should be linked with specific experiences through examples and illustrations.

(4) Interference. Barriers are usually under the control of the instructor. However, interference is made up of factors that are outside the direct control of the instructor: physiological, environmental, and psychological interference.

(a) Physiological interference is any biological problem that may inhibit symbol reception, such as hearing loss, injury, or physical illness.

(b) Environmental interference is caused by external physical conditions. An example of this is the noise level in many aircraft.

(c) Psychological interference is a product of how the instructor and the student feel at the time the communication process is occurring. Fear of the situation or mistrust between the instructor and student could severely inhibit the flow of information.

c. Developing Communication Skills. Communication skills must be developed; they do not occur automatically. The ability to effectively communicate stems from experience. The experience of instructional communication begins with role playing during the training to be an instructor, continues during the actual instruction, and is enhanced by additional training.

(1) Role-Playing. Experience in instructional communication comes from actually doing it. A new instructor can try out different instructional techniques with an assigned instructor or a mentor. A new instructor is more likely to find a comfortable style of communication in an environment that is not threatening. The new instructor is naturally most concerned about developing flight instruction skills. But it is also essential that he or she develop good ground instructional skills.

(2) Instructional Communication. Instruction has taken place when the instructor has explained a particular procedure and subsequently determined that the desired student response has occurred. The instructor should not be afraid to use examples of past experiences to illustrate particular points. An instructor's personal experiences make instruction more valuable than reading the same information in a textbook.

(a) Listening. An instructor needs to determine the abilities of the students and understand the students to properly communicate. One way of becoming better acquainted with students is to be a good listener. In order to master the art of listening, an attitude of wanting to listen must be developed.

(b) Instructors can improve the percentage of information transfer by teaching students how to listen. Students should be taught to:

1. Be Ready and Responsible. Listening is more than hearing. A student must be ready to listen and be responsible for listening. Otherwise, communication will fail.

2. Listen to Understand Not Refute. Students need to be reminded that emotions play a large part in determining how much information is retained. One emotional area to concentrate on is listening to understand rather than refute.

3. Be Emotionally Calm. If certain areas arouse emotion in a student, the student should be aware of this and take extra measures to listen carefully.

4. Listen for Main Ideas. People who concentrate on remembering or recording facts might very well miss the message because they have not picked up on the big picture. A listener must always ask, what is the purpose of what I am listening to?

5. Daydreaming is Dangerous. Most people can listen much faster than even the fastest instructor can speak. This leaves room for the mind to get off onto some other subjects. The listener who is aware of this problem can concentrate on repeating, paraphrasing, or summarizing the speaker's words.

6. Take Notes. Nobody can remember everything. Teaching a student to take notes allows the student to use an organized system to reconstruct what was said during the lesson. Note taking is merely a method of allowing the student to recreate the lecture so that it can be studied. The same note taking skills can be used outside the classroom any time information needs to be retained.

(c) Questioning. Good questioning can determine how well the student understands. It also shows the student that the instructor is paying

attention and is interested in the student's response. An instructor should ask both *open-ended questions* and *focused questions*. Open-ended questions allow the student to explain more fully. Focused questions allow the instructor to concentrate on desired areas. Two ways of confirming that the student and instructor understand things in the same way are:

1. Paraphrasing. The instructor can use paraphrasing to show what the student's statement meant to the instructor. The student can then make any corrections to clarify.

2. Perception Check. Perception checking gets to the feelings of the student; again by stating what perceptions the instructor has of the student's behavior while the student clarifies as necessary.

(d) Instructional Enhancement. The deeper the knowledge of a particular area, the better the instructor is at conveying that information. Additional knowledge and training will bolster the instructor's confidence and give the instructional presentation more depth. The instructor must be careful to put adequate information into the presentation without providing excessive information.

D. ENABLING LEARNING OBJECTIVE (ELO) #4:

ACTION: Identify the steps of the teaching process.

CONDITION: In a training situation.

STANDARD: IAW the Instructor Pilot's Handbook.

Learning Step/Activity - Provide instruction on the steps of the teaching process.

a. Effective teaching is based on principles of learning previously discussed. The learning process is not easily separated into a definite number of steps. The teaching process, on the other hand, can be divided into steps. The teaching of new material can be reduced to *preparation, presentation, application, and review and evaluation*.

b. Basic Steps of the Teaching Process.

(1) Preparation. For each lesson or instructional period, the instructor must establish objectives and goals to be attained. Well-defined objectives are needed to bring the unit of instruction into focus. They allow the instructor to structure the training and permit the student to clearly see what is required along the way.

(2) Presentation. Instructors have several methods of presentation. In this handout, the discussion is limited to the *lecture method*, the *demonstration-performance method*, and the *guided discussion*. The nature of the subject matter and the objective in teaching it normally determine the method of presentation.

(a) Lecture Method. The lecture method is suitable for presenting new material, for summarizing ideas, and for showing relationships between theory and practice.

(b) Demonstration-performance. The demonstration-performance method is desirable for teaching a skill, such as a ground school lesson on the flight computer, or during instruction on most flight maneuvers. The steps must be sequenced in the proper order so the students get a correct picture.

(c) Guided Discussion. It is a good method for encouraging active participation of the students. It is especially helpful in teaching subjects where the students can use initiative and imagination in addressing problem areas.

(3) Application. This is where the student uses what the instructor has presented. In most instructional situations, the instructor's explanation and demonstration activities are alternated with student performance data. This when habits are established. Faulty habits are difficult to correct and must be addressed as soon as possible.

(4) Review and Evaluation. Before the end of the instructional period, the instructor should review what has been covered during the lesson and require the student to demonstrate how well the lesson objectives have been met. Periodic review and evaluation by the instructor is necessary to:

(a) Make the student aware of their progress. Failure to make students aware of their progress, or lack of it, may create a barrier and impede instruction.

(b) Allow the student to compare their performance with the completion standard of the lesson so they really know how they are doing. Otherwise the student may become discouraged when the only visible competition, their instructor, is doing well and they are not.

(c) Allow both the instructor and the student to have a valid picture of where the student stands in respect to the established standard.

(d) Provide opportunities for both positive feedback and correction of faults.

E. ENABLING LEARNING OBJECTIVE (ELO) #5:

ACTION: Identify the methods of instruction.

CONDITION: In a training situation.

STANDARD: IAW the Instructor Pilot's Handbook.

Learning Step/Activity - Provide instruction on the methods of instruction.

a. Methods used most often. Although *lecture* and *demonstration-performance* may be the methods used most often, being aware of other methods and teaching tools such as *guided discussion*, *cooperative learning*, and *computer-based instruction* will better prepare an instructor for a wide variety of teaching situations. A teaching method is seldom used by itself. In a typical lesson, an effective instructor normally uses more than one method.

b. Organizing Material. Regardless of the teaching method used, an instructor must properly organize the material. Organizing a lesson is

necessary if the students are to learn and remember what they have been taught. Poorly organized information is of little or no value to the student. The traditional way of organizing a lesson is-*introduction, development, and conclusion.*

(1) Introduction. The introduction sets the stage for everything to come. Efforts in this area pay great dividends in terms of quality of instruction. The introduction is made up of three elements - *attention, motivation* and an *overview* of what is to be covered.

(a) Attention. The purpose of the attention element is to focus each student's attention on the lesson.

(b) Motivation. The purpose of the motivation element is to offer the students specific reasons why the lesson is important. This motivation should appeal to each student personally and engender s desire to learn the material.

(c) Overview. Every lesson introduction should contain an overview that tells the group what is to be covered. A clear, concise presentation of the objective and the key ideas gives the students a "road map of the route to be followed".

(2) Development. This is the main part of the lesson. Here the instructor develops the subject matter in a manner that helps the students achieve the desired outcomes. The instructor must logically organize the material to show the relationships of the main points by developing them in one of the following ways:

(a) Past to Present. In this pattern of development, the subject matter is organized chronologically.

(b) Simple to Complex. The simple-to-complex pattern helps the instructor lead the student from simple facts or ideas to an understanding of involved phenomena or concepts.

(c) Known to Unknown. By using something the student already knows as the point of departure, the instructor can lead into new ideas and concepts.

(d) Most Frequently Used to Least Frequently Used. Certain information or concepts are common to all that use the material. This fourth organizational pattern starts with common usage before progressing to the rarer ones.

(3) Conclusion. An effective conclusion retraces the important elements of the lesson and relates them to the objective. It reinforces student learning and improves retention.

c. Lecture Method. This is the most widely used form of presentation. Lectures are used for introduction of new subjects, summarizing ideas, showing relationships between theory and practice, and reemphasizing main points. Lectures may be combined with other teaching methods to give added meaning and direction.

(1) Teaching Lecture. Aviation instructors favor this method because it allows some active participation by the students. In the teaching

lecture, the feedback from the student is not nearly as obvious as in other methods and is difficult to interpret. The successful instructor must develop a keen perception to subtle responses from the class, interpret the meaning of the students' reactions and then adjust the lesson accordingly. Preparing the Teaching Lecture. The following four steps should be followed in the planning phase of preparation:

- (a) Establish the objective and desired outcomes.
- (b) Research the subject.
- (c) Organize the material.
- (d) Plan productive classroom activities.

(2) Advantages of the Lecture.

- (a) It is a convenient way to instruct large groups.
- (b) It can be used to present information that would be difficult to get in any other way.
- (c) It can be used to supplement other teaching methods.
- (d) An instructor can present many ideas in a relatively short time.
- (e) It is particularly suitable for explaining necessary background information.

(2) Disadvantages of the Lecture.

- (a) It often inhibits student participation.
- (b) It does not bring about maximum attainment of certain types of learning outcomes, i.e. motor skills.
- (c) It does not allow the instructor to estimate the students' understanding of material.
- (d) It is difficult to hold the attention of all students.

d. Cooperative or Group Learning Method. This is an instructional strategy which organizes students into small groups so they can work together to maximize their own and each other's learning. Advocates have noted that students completing cooperative learning group tasks tend to have higher test scores, higher self-esteem, improved social skills, and greater comprehension of the subjects they are studying.

e. Guided Discussion Method. In a guided discussion method the instructor relies on the students to provide ideas, experiences, opinions, and information. The goal is to draw out what the students know, rather than to spend the class period telling them. The instructor acts as a facilitator to encourage discussion between students.

(1) Use of Questions in a Guided Discussion. In the guided discussion, learning is achieved through the skillful use of questions.

Effective use of questions may result in more student learning than any other single technique used by instructors. In general, instructors should ask open-ended questions that are thought provoking and require more mental activity than simply remembering facts. Questions can be categorized by function and by characteristics.

(a) Function.

1. Leadoff Question. The instructor often uses a question to open up an area of discussion. The purpose is to get the discussion started.

2. Follow-up Question. This is used after the discussion develops to further guide the discussion.

3. Overhead Question. This question is directed to the entire group to stimulate thought and response from each group member.

4. Rhetorical Question. This is similar to the overhead question however; the instructor provides the answer.

5. Direct Question. The instructor will use this when a response is desired from a specific individual.

6. Reverse Question. This is used in response to a student's question. Rather than give a direct answer, the instructor can redirect the question to another student.

7. Relay Question. This type of question is redirected to the group instead of the individual.

(b) Characteristics.

1. Have a specific purpose.

2. Be clear in meaning.

3. Contain a single idea.

4. Stimulate thought.

5. Require definite answers.

6. Relate to previously covered information.

(2) Planning a Guided Discussion. Planning a guided discussion is basically the same as planning a lecture. The instructor will find the following suggestions helpful.

(a) Select a topic the students can profitably discuss.

(b) Establish a specific lesson objective with desired learning outcomes.

(c) Conduct adequate research to become familiar with the topic.

(d) Organize the main and subordinate points in a logical sequence.

(e) Plan at least one leadoff question for each learning outcome.

(3) Student Preparation for a Guided Discussion. It is the instructor's responsibility to help students prepare for the discussion. Each student should be encouraged to accept responsibility for contributing to the discussion and benefiting from it. In preparing for the discussion the students should be made aware of the objective.

(4) Guiding a Discussion-Instructor Technique. The instructor needs to keep up with the discussion and know where to intervene with questions or redirect the group's focus. The following information provides a framework for successfully conducting the guided discussion.

(a) Introduction. A guided discussion is introduced in the same manner as the lecture. It should include an attention element, a motivation element, and an overview of key points. The instructor should create a relaxed, informal atmosphere.

(b) Discussion. The instructor opens the discussion by asking one of the prepared leadoff questions. After asking a question, the instructor should be patient. The instructor should have answer in mind, but the students have to think before answering. Once the discussion is underway, the instructor should listen attentively. As the discussion proceeds, the instructor may find it necessary to guide the direction. When it appears the students have discussed the ideas that support this particular part of the lesson, the instructor should summarize.

(c) Conclusion. In conclusion, the instructor should tie together the various points or topics discussed, and show the relationships between the facts brought out and the practical application of these facts. If the discussion revealed that one or more members of the group do not understand certain areas, the instructor should clarify or cover this material again.

f. Demonstration-Performance Method. This method of teaching is based on the simple, yet sound principle that we learn by doing. Students learn physical or mental skills by actually performing those skills under supervision. Every instructor should recognize the importance of student performance in the learning process. The demonstration-performance method of teaching has five essential phases.

(1) Explanation Phase. Explanations must be clear, pertinent to the objectives of the lesson to be presented, and based on the known experience and knowledge of the students. In teaching a skill, the instructor must convey to the students the precise actions they are to perform as well as the end result of these efforts.

(2) Demonstration Phase. The instructor must show students the actions necessary to perform the skill. If, due to some unanticipated circumstances, the demonstration does not closely conform to the explanation, this deviation should be immediately acknowledged and explained.

(3) Student Performance and Instructor Supervision Phase. Student performance requires students to act and do. To learn skills, students must practice. The instructor must allot enough time for meaningful student activity. Through doing, students learn to follow correct procedures and to reach established standards. It is important that students be given an opportunity to perform the skill as soon as possible after the demonstration while the instructor coaches as necessary.

(4) Evaluation Phase. In this phase, the instructor judges student performance. The student displays whatever competence has been attained, and the instructor discovers how well the skill has been learned. From this measurement of student achievement, the instructor determines the effectiveness of the instruction.

g. Computer-Based Training Method. Many new and innovative training techniques are available today. One of the most significant is computer based training (CBT)-the use of the personal computer (PC) as a training device. The new generation of student is as comfortable with a personal computer as they are with the telephone. As a result, educators are using personal computers as part of educational programs of all types. The advantages are:

- (1) The amount of manpower necessary to train aircrews and maintenance technicians on new equipment has been reduced.
- (2) The students can progress at a rate comfortable to them.
- (3) They can also access the CBT at their own convenience.
- (4) Computers are being used for training at many different levels, for example flight training devices and flight simulators.
- (5) Students are able to access computerized versions of test prep study guides. The CBT gives them immediate feedback on how they did on the test and a review of questions missed.
- (6) More advanced CBT applications allow students to progress through a series of interactive segments where the presentation varies as a result of their responses.
- (7) The major advantage of CBT over other forms of instruction is that it is interactive-it responds in different ways depending on the student's input.

h. Computer assisted instruction. This refers to the computer as a tool and is much more descriptive of the way instructors should utilize the computer in aviation training.

(1) Computer based training should not be used as a stand-alone training any more than a textbook or video. Since aviation training is all encompassing and dynamic, entrusting an entire training program to a computer is not practical.

(2) In teaching flight students, CBT programs can be used by the instructor as simply another form of reference for students to study. The instructor must continue to monitor and evaluate the student's progress as usual.

F. ENABLING LEARNING OBJECTIVE (ELO) #6:

ACTION: Identify the elements involved in an effective critique.

CONDITION: In a training situation.

STANDARD: IAW the Instructor Pilot's Handbook.

Learning Step/Activity - Provide instruction on the elements involved in an effective critique.

a. The Instructor as a Critic. No skill is more important to an instructor than the ability to analyze, appraise, and judge student performance. The student naturally looks to the instructor for guidance, analysis, appraisal, as well as suggestions for improvement and encouragement. This feedback from the instructor to student is called a critique. A critique is not a step in the grading process, but a step in the learning process. A critique is not necessarily negative in content.

b. Purpose of a Critique. A critique should provide the students with something constructive upon which they can work or build. It should provide direction and guidance to raise their level of performance. A critique can also be used as a tool for reteaching.

c. Characteristics of an Effective Critique. In order to provide direction and raise the students' level of performance, the critique must be factual and aligned with the standards. Some of the requirements for an effective critique are:

(1) Objective. The effective critique is focused on the students and their performance and should not reflect the personal opinions, likes, dislikes, and biases of the instructor. It must be honest and based on the performance as it was, not as it could have been, or as the instructor and student wished that it had been.

(2) Flexible. The challenge of the critique for an instructor is to determine what to say at the proper moment. An effective critique is one that is flexible enough to satisfy the requirements of the moment.

(3) Acceptable. Before students willingly accept their instructor's criticism, they must first accept the instructor. They must have confidence in the instructor's qualifications, teaching ability, sincerity, competence, and authority. If a critique is presented fairly, with authority, conviction, sincerity, and from a position of recognized competence, it will be accepted by the student.

(4) Comprehensive. A comprehensive critique is not necessarily a long one nor must it treat every aspect of the performance in detail. To dwell on the excellence of a performance, to the neglect of that portion that should be improved, is a disservice to the student.

(5) Constructive. A critique is pointless unless the student profits from it. Praise for praise's sake is of no value. Negative criticism that does not point toward improvement or a higher level of performance should be omitted from a critique.

(6) Organized. Unless a critique follows some pattern of organization, a series of otherwise valid comments may lose their impact. Almost any pattern is acceptable as long as it is logical and makes sense to the student as well as the instructor.

(7) Thoughtful. The critique should never minimize the dignity and importance of the individual. Ridicule, anger, or fun at the expense of the student has no place in a critique. While being straightforward and honest, the instructor should always respect the student's personal feelings.

(8) Specific. Be specific, not so general that the student can find nothing to hold on to. The student needs to focus on something that is concrete. At the conclusion of a critique, students should have no doubt what they did well, what they did poorly and, most important, specifically how they can improve.

d. Ground Rules for Critiquing. There are a number of rules and techniques to keep in mind when conducting a critique. The following list will help the instructor to render an effective critique.

(1) Except in rare and unusual instances; do not extend the critique beyond its scheduled time and into the time allotted for other activities.

(2) Avoid trying to cover too much.

(3) Allow time for a summary of the critique itself to reemphasize the important things a student should remember.

(4) Avoid dogmatic or absolute statements. Remember that most rules have exceptions.

(5) Don't allow yourself to be maneuvered into the position of defending criticism. If it is honest, objective, constructive, and comprehensive, no defense is necessary.

(6) If part of the critique is written, make certain that it is consistent with the oral portion.

G. ENABLING LEARNING OBJECTIVE (ELO) #7:

ACTION: Select the components of the evaluation process.

CONDITION: In a training situation.

STANDARD: IAW the Instructor Pilot's Handbook.

Learning Step/Activity - Provide instruction on selecting the components of the evaluation process.

a. Whenever learning takes place, the result is a definable, observable, measurable change in behavior. The purpose of an evaluation is to determine how a student is progressing. It is essential to determine what the students are learning and how well they are learning it.

b. Methods of evaluation. The instructor's evaluation may be accomplished by an *oral quiz, written test, or skill performance.*

(1) Oral Quizzes. The most used means of evaluation is the direct or indirect oral questioning of students by the instructor. Proper quizzing by the instructor can have a number of desirable results.

(a) Characteristics of Effective Questions:

1. An effective question has only one correct answer.
2. Questions must apply to the subject of instruction.
3. They should be brief and concise, but also clear and definite.
4. Questions must be adapted to the ability, experience, and stage of training of the students.

(b) Types of Questions to Avoid. Asking, "Do you understand?" or "Do you have any questions?" has no place in effective quizzing. Other typical types of questions that must be avoided are:

1. Puzzle.
2. Oversize.
3. Toss-up.
4. Bewilderment.
5. Trick.
6. Irrelevant.
7. Questions that require "yes" and "no" or "one-word" answers.

(c) Answering Questions from Students. Responses to student questions must also conform to certain considerations if answering is to be an effective teaching method. They are:

1. The question must be clearly understood before an answer is attempted.
2. The instructor should display interest in the student's question and frame an answer that is direct and accurate.
3. After the instructor completes a response, it should be determined if the student is satisfied with the answer.
4. Determine whether the student's question will unnecessarily complicate learning the task at hand or would it be better to address the question at a later time.
5. Admit not knowing the answer, but promise to get the answer.

(2) Written Tests. Written tests are only as good as the knowledge and proficiency of the test writer. Effective tests have six primary characteristics:

(a) Reliability. The reliability of a written test is judged by whether it gives consistent measurement to a particular individual or group.

(b) Validity. Tests used in the classroom are valid only to the extent that they measure achievement of the objectives of instruction.

(c) Usability. This refers to the functionality of the test i.e. printed type size, wording, graphics, charts and illustrations.

(d) Objectivity. This describes singleness of scoring of a test; it does not reflect the biases of the person grading the test.

(e) Comprehensiveness. A test must sample an appropriate cross-section of the objectives of instruction.

(f) Discrimination. A test must be able to measure small differences in achievement in relation to the objectives of the course. When a test is discriminatory:

1. There is a wide range of scores.

2. All levels of difficulty are included.

3. Each item distinguishes between the students who are low and those who are high in achievement of the course objectives.

(3) Performance Tests. Performance testing is desirable for evaluating training that involves an operation, a procedure, or a process. It must be based on established standards and suited to the student's experience and stage of development.

H. ENABLING LEARNING OBJECTIVE (ELO) #8:

ACTION: Identify the responsibilities of an instructor.

CONDITION: In a training situation.

STANDARD: IAW the Instructor Pilot's Handbook.

Learning Step/Activity - Provide instruction on the responsibilities of an instructor.

a. Aviation Instructor Responsibilities. The primary job of an instructor is to teach. As indicated, the learning process can be made easier by helping students learn, providing adequate instruction, demanding adequate standards of performance, and emphasizing the positive.

(1) Helping Students Learn.

(a) Learning should be an enjoyable experience. This does not mean the instructor must make it easy for the student or sacrifice standards. The idea that people must be led to learning by making it easy is a fallacy. People want to feel capable; they are proud of the successful achievement of difficult goals.

(b) Learning should be interesting. Knowing the objective of each period of instruction gives meaning and interest to the student as well as the instructor.

(c) Learning to fly should provide students with an opportunity for exploration and experimentation. This encourages them to discover their own capabilities and helps to build self-confidence.

(d) Learning to fly should be a habit-building period. The instructor should keep the students focused on good habits both by example and by a logical presentation of learning tasks.

(e) The instructor should take specific steps if student learning is to be a positive and efficient experience.

1. Devise a plan of action.
2. Create a positive student-instructor relationship.
3. Transfer responsibility to the student as learning occurs.
4. Evaluate student learning and thereby measure teaching effectiveness.

(f) Helping the student learn does not mean that the instructor has the responsibility for performing tasks that the students need to do for themselves. This is not effective instruction.

(2) Providing Adequate Instruction. The flight instructor should attempt to carefully and correctly analyze the student's personality, thinking, and ability. No two students are alike, and the same methods of instruction cannot be equally effective. The instructor must talk with the student at some length to learn about their background, interests, temperament, and way of thinking. An instructor who has not correctly analyzed a student may soon find that the instruction is not producing the desired results.

(a) Slow Learner. A student whose slow progress is due to discouragement and a lack of confidence should be assigned "sub-goals" that can be attained more easily than the normal learning goals. Complex lessons can be separated into elements, and each element practiced until an acceptable performance is achieved before the whole maneuver or operation is attempted.

(b) Fast Learner. Students who are fast learners can also create problems for the instructor. Because they make few mistakes, they may assume the correction of errors is unimportant. Such overconfidence may soon result in faulty performance. For such students, the instructor should constantly raise the standard of performance for each lesson, demanding greater effort.

(3) Standards of Performance. Flight instructors must continuously evaluate their own effectiveness and the standard of learning and performance achieved by their students. The desire to maintain pleasant personal relationships with the student must not cause the acceptance of a slow rate of learning or substandard performance. Instructors fail to

provide competent instruction when they permit their students to get by with a substandard performance.

(4) Emphasizing the Positive. Aviation instructors have a tremendous influence on their student's perception of aviation. The way instructors conduct themselves, the attitudes they display, and the manner in which they develop their instruction all contribute to the formation of either positive or negative impressions by their students. The success of an aviation instructor depends in large measure, on the ability to present instruction so that students develop a positive image of aviation.

b. Flight Instructor Responsibilities. All aviation instructors shoulder an enormous responsibility. Flight instructors have some additional responsibilities including evaluating student pilots and making a determination of when they are ready to move on to the next phase of training. Evaluation is one of the most important elements of instruction. The following should be considered in rendering an effective evaluation.

(1) Standards of Performance. Evaluation of ability during flight instruction must be based on established standards of performance, suitably modified to apply to the student's experience and stage of development.

(2) Keep the Student Informed. It is important for the flight instructor to keep the student informed of progress. This may be done as each procedure or maneuver is completed and summarized during postflight critiques.

(3) Taking the Controls. Correction of student errors should not include the practice of taking the controls away from students immediately when a mistake is made. It is difficult for students to learn to do a maneuver properly if they seldom have the opportunity to correct an error.

I. ENABLING LEARNING OBJECTIVE (ELO) #9:

ACTION: Choose the characteristics that identify the flight instructor as a professional.

CONDITION: In a training situation.

STANDARD: IAW the Instructor Pilot's Handbook.

Learning Step/Activity - Provide instruction on the characteristics that identify the flight instructor as a professional.

a. Professionalism. As an IP in the Army, you will be looked upon as a professional. Your students will expect from you an extremely high standard of performance. To meet this requirement, you must be fully qualified as a pilot and must have a thorough knowledge of teaching principles. In addition, you must continually analyze your overall performance to see that it is professional in every respect. The following items should be considered.

(1) Sincerity. The professional instructor pilot should be straightforward and honest in every way. They must be what they seem to be. Any facade of instructor pretentiousness whether the student real or mistakenly assumes, will immediately cause a loss of confidence by the student in the instructor, and learning will be adversely affected.

(2) Acceptance of the Student. The professional instructor pilot must accept the students just as they are, with all their faults and all of their problems. In no case should the IP do anything that implies that they are degrading the student. Acceptance and support, rather than reproof and ridicule will encourage learning.

(3) Personal Appearance and Habits. Personal appearance has an important effect on the professional image of the instructor. Personal habits also have a significant effect. The exercise of common courtesy is perhaps the most important. A rude, thoughtless, and inattentive instructor cannot hold the respect of the student. Cleanliness of body and breath is especially important.

(4) Demeanor. The flight instructor's attitude and behavior can contribute much to a professional image. The professional image requires development of a calm, thoughtful, and disciplined, but not somber, demeanor. They should avoid reacting differently to similar or identical errors at different times. A professional instructor will also avoid demanding unreasonable performances or progress or criticizing a student unfairly. Effective instruction is best conducted in a calm, pleasant, thoughtful approach that puts the student at ease.

(5) Safety Practices and Accident Prevention. The safety practices emphasized by instructors have a long lasting effect on students. Habitual observance of regulations, safety precautions, and the precepts of courtesy will enhance the instructor's image of professionalism. Moreover, such habits make the instructor more effective by encouraging students to develop similar habits.

(6) Proper Language. The use of profanity or obscene language leads to distrust and lack of confidence. It is impossible for the instructor to know the true feelings of a student on the use of profanity. The professional instructor must speak normally and without inhibitions, but must develop the ability to speak positively and descriptively without excesses of language.

(7) Self-improvement. The professional instructor must never become complacent or satisfied with their qualifications and ability. They should always be alert for ways to improve. The flight instructor is considered an authority on aeronautical subjects and is the expert to whom many pilots will refer questions. They must stay abreast of all changes in regulations, traffic control procedures, and technical information affecting his aircraft. They must make a point of reading all available publications that will affect them, and secondly, they should be eager to pass along any information that can be beneficial to others in the same profession.

b. Minimizing Student Frustrations. Minimizing student frustration during flight training is a basic instructor responsibility. By following some basic rules, instructors can reduce student frustration and create a learning environment that will encourage rather than discourage learning.

(1) Motivate Students. More can be gained from wanting to learn than from being forced to learn.

(2) Keep Students Informed. Students feel insecure when they do not know what is expected of them or what is going to happen to them.

(3) Approach Students as Individuals. Each group has its own personality that stems from the characteristics and interactions of its members. However, each individual within the group has a personality that is unique and that should be considered.

(4) Give Credit When Due. Praise or credit from the instructor is usually ample reward and provides an incentive to do even better. Praise pays dividends in student effort when deserved, but when given too freely, it becomes valueless.

(5) Be consistent. Students have a keen interest in knowing what is required to please the instructor. If the same thing is acceptable one day and not acceptable the next, the student becomes confused.

(6) Admit Errors. No one is perfect. The instructor can win the respect of students by honestly acknowledging mistakes. If the instructor tries to cover up or bluff, the student will be quick to sense it and it will destroy the student's confidence.

c. Additional Responsibilities. Other areas aviation instructors should be deeply involved with include accident prevention and judgement training.

J. ENABLING LEARNING OBJECTIVE (ELO) #10:

ACTION: Identify elements of the techniques of flight instruction.

CONDITION: In a training situation.

STANDARD: IAW the Instructor Pilot's Handbook.

Learning Step/Activity - Provide instruction on the techniques of flight instruction.

a. The Telling-and-Doing Technique. This technique has been in use for a long time and is very effective in teaching physical skills. Flight instructors find it valuable in teaching procedures and maneuvers. The telling and doing technique of flight instruction follows the four basic steps of the teaching process and the demonstration-performance method. However, the telling-and-doing technique includes specific variations for flight instruction.

(1) The first step is particularly important in flight instruction because of the new concepts and complexities involved. The flight instructor needs to be well prepared and highly organized if complex ideas and skills are to be taught effectively. The student must be intellectually and psychologically ready for the learning activity. The *preparation* step is accomplished prior to the flight lesson, by careful consideration and discussion of objectives, and by a thorough preflight discussion. Steps two, three, and four of the teaching process can be accomplished by "telling and doing."

(2) Instructor Tells-Instructor Does. *Presentation* is the second step in the teaching process. It is a continuation of preparing the student, which began in the detailed preflight discussion, and now continues by a carefully planned demonstration and accompanying verbal explanation of the procedure or maneuver. It is important that the demonstration conform to the

explanation as closely as possible. If a deviation does occur, the instructor should point it out and account for it. Instructors should also take care to clearly describe the actions that students are expected to perform. Communication is the key.

(3) Student Tells-Instructor Does. This is a transition between the second and the third steps in the teaching process. It is the most obvious departure from the demonstration-performance technique, and may provide the most significant advantages.

(a) First the student should be able to organize his or her thoughts regarding the steps involved and the techniques to be used. In the process of explaining the maneuver as the instructor performs, perceptions begin to develop into insights.

(b) Second, with the student doing the talking, the instructor is able to evaluate the student's understanding of the factors involved in the performance of the maneuver.

(4) Student Tells-Student Does. *Application* is the third step in the teaching process. This is where learning takes place and where performance habits are formed. If the student has been adequately prepared (first step) and the procedure or maneuver fully explained and demonstrated (second step), meaningful learning will occur.

(a) The instructor should be alert during the student's practice to detect any errors in technique and to prevent the formation of erroneous ideas or faulty habits. In this step, the thinking is done verbally.

(b) In addition to forcing total concentration on the part of the student, this method provides a means for keeping the instructor aware of what the student is thinking.

(c) In addition to learning how to do something, the student is learning a self-teaching process that is highly desirable in development of a skill.

(5) Student Does-Instructor Evaluates. The fourth step of the teaching process is *review and evaluation*. The instructor reviews what has been covered during the instructional flight and determines to what extent the student has met the objectives outlined during the preflight discussion. The instructor observes as the student performs, then makes appropriate comments. When pointing out areas that need improvement, offer concrete suggestions that will help. If possible, avoid ending the evaluation on a negative note.

b. Obstacles to Learning during Flight Instruction. Certain obstacles are common to flight instruction and may apply directly to the student's attitude, physical condition, and psychological make-up. These include:

(1) Unfair Treatment. Students who believe that their instruction is inadequate, or that their efforts are not conscientiously considered and evaluated, will not learn well. Motivation will decline when the student believes the instructor is making unreasonable demands. The assignment of impossible goals discourages the student, diminishes effort and retards the learning process.

(2) Impatience. The impatient student fails to understand the need for preliminary training and seeks only the ultimate objective without considering the means necessary to reach it. The instructor can correct student impatience by presenting the necessary preliminary training one step at a time, with clearly stated goals for each step. Impatience can result from instruction keyed to the pace of a slow learner when it is applied to a motivated, fast learner. Disinterest grows rapidly when unnecessary repetition and drill are required.

(3) Worry or Lack of Interest. Students who are worried or emotionally upset are not ready to learn and derive little benefit from instruction. Worry or distraction may be due to student concerns about progress in the training course, or may stem from outside diversions. Worries that result from a flight training course can be identified and address. The most effective cure is prevention. The instructor must be alert to see that the students understand the objectives of each step of their training, and that they know at the completion of each lesson exactly how well they have progressed and what deficiencies are apparent.

(4) Physical Discomfort, Illness, and Fatigue will materially slow the rate of learning during both classroom instruction and flight training.

(a) Physical discomfort. Students, whose attention is diverted by discomforts such as extremes of temperature, poor ventilation, inadequate lighting, or noise and confusion, cannot learn at a normal rate.

(b) Illness. Most illnesses adversely affect the acuteness of vision, hearing, and feeling all of, which are essential to correct performance.

(c) Fatigue. Once fatigue occurs as a result of application to a learning task, the student should be given a break. Fatigue can be delayed by introducing a number of maneuvers that involve different elements and objectives. Flight instruction should be continued only as long as the student is alert, receptive and performing at a level consistent with experience.

(5) Apathy. Students quickly become apathetic when they recognize that the instructor has made inadequate preparation, or when instruction appears deficient, contradictory, or insincere. Well-planned, appropriate, and accurate instruction must be provided. Nothing destroys a student's interest so quickly as a poorly organized period of instruction.

(6) Anxiety. This frequently limits the student's perceptive ability and retards the development of insights. The student must be comfortable, confident in the instructor and the aircraft, and at ease, if effective learning is to occur. Providing this atmosphere for learning is one of the first and most important tasks of the instructor.

