Aircraft engines represent another example of abstractions. When an instructor refers to aircraft engines in general, some learners might think of jet engines, while others would think of reciprocating engines. Even reciprocating engine is too abstract since it could be a radial engine, an inline engine, a V-type engine, or an opposed type engine. Use of the technical language of engines, as in Lycoming IO-360, would narrow the engine type, but would only be understood by learners who understand the terminology particular to aircraft engines.

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. The danger of abstractions is that they do not evoke the same specific items of experience in the minds of the learners that the instructor intends. When such terms are used, they should be linked with specific experiences through examples and illustrations.

For instance, when an approach to landing is going badly, telling a learner to take appropriate measures might not result in the desired action. It would be better to tell the learner to conduct a go-around since this is an action that has the same meaning. When maintenance learners are being taught to torque the bolts on an engine, it would be better to tell them to torque the bolts in accordance with the maintenance manual for that engine rather than simply to torque the bolts to the proper values. Whenever possible, the level of abstraction should be reduced by using concrete, specific terms. This better defines and gains control of images produced in the minds of the learners.

External Factors

Some barriers to effective communication can be controlled by the instructor. Others are external factors outside of the instructor's control that prevent a process or activity from being carried out properly. These factors may include physiological, environmental, and psychological elements. To communicate effectively, the instructor should consider the effects of these factors and mitigate them where possible.

Physiological external factors include biological conditions such as hearing loss, injury, physical illness, or other congenital condition. These physiological factors may cause learner discomfort and inhibit communication. The instructor should adapt the presentation to allow the learner to feel better about the situation and be more receptive to new ideas. Adaptation could be as simple as putting off a lesson until the learner is over an illness. Another accommodation could be the use of a seat cushion to allow a learner to sit properly in the airplane.

With the advent of more sophisticated technology, multitasking has become a form of physiological external factors. The term multitask comes from a computer's ability to simultaneously execute more than one program or task at a time. Although it now refers to humans performing multiple tasks simultaneously, humans are not computers. Research shows that although human comprehension can handle two simple, low-level cognitive tasks at once, a higher level cognitive task takes brain function and concentration to perform optimally. Adding even a simple activity diminishes the comprehension and recall of both. Research shows that multitasking is just a series of constant micro-interruptions and "stop-go" decisions, all of which tend to reduce mental and motor performance.

Environmental external factors are caused by external physical conditions. One example of this is the noise level found in many light aircraft. Noise not only impairs the communication process, but also can result in long-term damage to hearing. One solution to this problem is the use of headphones and an intercom system. If an intercom system is not available, a good solution is the use of earplugs. It has been shown that in addition to protecting hearing, use of earplugs actually clarifies speaker output. Vibration is another possible example of environmental external factors, applicable to rotary wing aircraft.

A psychological external factor is a product of how the instructor and learner feel at the time the communication process is occurring. If either instructor or learner is not committed to the communication process, communication is impaired. Fear of the situation or mistrust between the instructor and learner disrupts communication and severely inhibits the flow of information.

Interference

Interference occurs when the message gets disrupted, truncated, or added to somewhere in the communication sequence. While the instructor or learner may believe that an intact message has been sent and received, the assumption may be inaccurate. Noise and other factors may distort the message. Psychological factors also interfere with the receipt of a message. Instructors and learners confirm the message and its proper communication when observing the effect of a message. Additional feedback and confirmation reduce potential harmful effects from interference.

Developing Communication Skills

Communication skills need to 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 training to be an instructor, continues during the actual instruction, and is enhanced by additional training.