The active nature of e-learning enhances the overall learning process several ways. Well-designed programs allow learners to feel more in control of the content and how fast they learn it. They can explore areas of interest and discover more about a subject on their own. In addition, e-learning often seems more enjoyable than learning from a classroom lecture. Main advantages include less time spent on instruction compared to traditional classroom training, and a higher level of mastery and retention.

Distance learning, or the use of electronic media to deliver instruction when the instructor and learner are separated, is another advantage to e-learning. Participants in a class may be located on different continents, yet share the same teaching experience. Distance learning also may be defined as a system and process that connects learners with resources for learning. As sources for access to information expand, the possibilities for distance learning increase.

While e-learning has many training advantages, it also has limitations which can include the lack of peer interaction and personal feedback, depending on what method of e-learning is used. For the instructor, maintaining control of the learning situation may be difficult. It also may be difficult to find good programs for certain subject areas, and the expense associated with the equipment, software, and facilities need to be considered. In addition, instructors and learners may lack sufficient experience with specific programs to take full advantage of the software that is available.

Improper or excessive use of e-learning should be avoided. For example, a flight instructor should not rely exclusively on a software program on traffic patterns and landings to do the ground instruction for a learner pilot, and then expect the learner to demonstrate patterns and landings in the aircraft. Likewise, it would be unfair to expect a maintenance learner to safely and properly perform a compression check on an aircraft engine if he or she received only e-learning training.

Along with the many types of e-learning, there are a variety of terms used to describe the educational use of the computer. This handbook will use the term "computer-assisted learning" in the following discussion.

Computer-Assisted Learning (CAL) Method

Computer-assisted learning (CAL) couples the personal computer (PC) with multimedia software to create a training device. For example, major aircraft manufacturers have developed CAL programs to teach aircraft systems and maintenance procedures to their employees, reducing the amount of instructor time necessary to train aircrews and maintenance technicians on the new equipment. End users of the aircraft, such as the major airlines, can purchase the training materials with the aircraft in order to accomplish both initial and recurrent training of their personnel. Major advantages of CAL are that learners can progress at a rate which is comfortable for them and are often able to access the CAL at their own convenience.

Another benefit of CAL is an FAA test prep study guide, useful for preparation for the FAA knowledge tests. These programs typically allow the learners to select a test, complete the questions, and find out how they did on the test. The learner may then conduct a review of questions missed.

Some of the more advanced CAL applications allow learners to progress through a series of interactive segments where the presentation varies as a result of their responses. They can focus on the area they either need to study or want to study. For example, a maintenance learner who wants to find information on the refueling of a specific aircraft could use a CAL program to access the refueling section, and study the entire procedure. If the learner wishes to repeat a section or a portion of the section, it can be done at any time.

CAL programs can be used by the instructor as another type of study reference. Just as a learner can reread a section in a text, the learner may review portions of a CAL program. The instructor should continue to monitor and evaluate the progress of the learner as usual. This is necessary to be certain a learner is on track with the training syllabus. When using CAL, instructors may do more one-on-one instruction than in a normal classroom setting, since repetitive forms of teaching may be accomplished by computer. Remember, the computer has no way of knowing when a learner is having difficulty, and it will always be the responsibility of the instructor to provide monitoring and oversight of learner progress. *[Figure 5-13]*

Real interactivity with CAL means the learner is fully engaged with the instruction by doing something meaningful which makes the subject of study come alive. For example, the learner controls the pace of instruction, reviews previous material, jumps forward, and receives instant feedback. With advanced tracking features, CAL also can be used to test the learner's achievement, compare the results with past performance, and indicate weak or strong areas.

For most aviation training, the computer should be thought of as a valuable instructional aid, and CAL is a useful tool for aviation instructors. For example, in teaching aircraft maintenance, CAL programs produced by various aircraft manufacturers can be used to expose learners to equipment not normally found at a maintenance school. Another use of computers would allow learners to review procedures at their own pace while the instructor is involved in hands-on training with others. The major advantage of CAL is that it is interactive—the computer responds in different ways, depending on learner input. When using CAL, the instructor should remain actively involved with the learners by using close supervision, questions, examinations, quizzes, or guided discussions on the subject matter to constantly assess progress.