

# Interactive Courseware Levels

## 2.1 ICW Level 1: Passive

Most CAIs

*The student acts solely as a receiver of information.*

### Low Grade Presentation

This is the lowest (baseline) level of Interactive Courseware (ICW) development. It is normally a knowledge or familiarization lesson, provided in a linear format (one idea after another). Level 1 is primarily used for introducing an idea or concept. The user has little or no control over the sequence of the lesson material. Minimal interactivity is provided by selective screen icons and inserted into the lesson through typical input/output peripherals and programming protocols. This level may include simple developed graphics, clip art, and/or video and audio clips. Lessons will contain questions or performance-based assessments to verify and reinforce the student's retention of the lesson material. Assessment items will provide feedback and/or remediation to prior lesson content following incorrect responses or actions.

## 2.2 ICW Level 2: Limited Participation

CAIs with interactivity  
such as interacting with  
CNI-MUs

*The student makes simple responses to instructional cues.*

### Medium Grade Presentation

This level of ICW development involves all levels of learning from recall of information to performing skills. Level 2 allows the user to have increased control over lesson presentation; that is, there is more interaction. Whereas Level 1 lesson progress is controlled by the courseware, in Level 2, the student takes an active role in the control of progress through the lesson, up to and including control of animated sequences. Multiple objects may appear on the screen and may move independently or may be controlled by the user. Level 2:

1. Will combine audio, video, text, graphics, and animation.
2. May use simple branching (up to 2 levels), testing, and immediate feedback.
3. While normally used for recall of facts, rules, and concepts, can also support other instructional strategies such as Tutorials, Drill/Practice, and Collaborative Learning.
4. As an example, students may be required to rotate switches, interpret multiple sources of information, make real-time adjustments, and/or identify and correct malfunctions as part of a set of scripted procedures to be taught and learned.
5. While learning in such scenarios tends to be single-path and scripted, instructional challenges are embedded such that incorrect selections or departure from the required events is acknowledged with context-appropriate feedback. The increased level of learning at this level is achieved by using advanced 2-D/3-D interactive graphics/animations, multiple student prompts within a problem-solving environment, and advanced frame and lesson navigation prompts.

It is anticipated that the number of interactive frames falling within this level will make up approximately 25–30% of the lessons. Training at this level within the virtual environment is expected to be focused primarily on individual training requirements that will serve as basis for subsequent higher-level individual or team training requirements.

### 2.3 ICW Level 3: High Simulation Presentation

#### Performance

*The student makes complex responses to simulations with the assistance of an instructor.*

This level involves the recall of more complex information compared to Levels 1 and 2 and allows the user an increased level of control over the lesson scenario through peripherals. For Level 3:

1. Lesson-scenario training material typically is complex and involves more frequent use of peripherals, such as light pens or touch screens, to affect a transfer of learning. Lessons may support either individual or limited team training scenarios.
2. Procedures are normally practiced with Level 3 scenarios and students may be required to alternate between multiple screens to keep pace with the lesson material. Multiple software branches and rapid response are provided to support remediation.
3. Emulations and simulations are an integral part of this presentation. This level may also include complex developed graphics, and/or clip art, and video and audio clips.
4. Video, graphics, or a combination of both simulate the operation of a system, subsystem, or equipment to the user through a replication of target functionality that may or may not have a physics-based model running underneath it depending on the learning objective.
5. These learning scenarios may provide multiple branching pathways that allow students to address procedural or operational challenges in real-time.

It is anticipated that the number of interactive frames falling within this level will make up approximately 50–60% of the lessons. Lessons may be designed for either individual or multiple live individuals (a team) participating together within the same training scenario. This type of training will essentially provide the virtual equivalent of a part-task trainer. Controls, screens, and similar technical representations will be fully functional to the extent necessary to accomplish the training. The student will have the ability to alter settings and controls and other students within the scenario will be able to see the results of the change to the extent that such a change would normally be apparent. Selection of controls at incorrect times (out of sequence) will be permitted and effects may or may not be made immediately apparent to the student. Some limited self-learning may be permitted in these instances prior to the lesson directing the student back to the correct path before negative training occurs.

Equipment, systems, and controls not relevant to the immediate task will normally be represented but will not be active. An exception to this may occur if it is determined that a common error may be involved, and part of the training is to address such common errors that may occur when performing the primary task.

## 2.4 ICW Level 4: Real-time Participation

*The student is directly involved in a life-like set of complex cues and responses.*

### Real-time Simulation Presentation

This ICW level involves more in-depth recall of a larger amount of information (compared to Levels 1, 2, and 3) and allows the user an increased level of control over the lesson. Every possible subtask is analyzed and presented with full, on-screen interaction, similar to the approach used in aircraft simulator technology. Level 4 material:

1. Is extremely complex and involves more frequent use of peripherals to affect the transfer of learning
2. Normally supports certification, recertification, or qualification requirements
3. Most often uses combinations of scenarios, simulation, gaming, and drill-practice as the chosen instructional strategy. The substantial use of automated role-players with extensive intelligent tutoring can be expected.
4. Complicated operation and maintenance procedures, with full system functionality and physics-based math model running in the background are normally practiced with level 4 and involve all of the elements of Levels 1, 2, and 3 presentations plus the following:
  - a. High degree of interactivity
  - b. Extensive branching
5. Levels of sophistication: Short of artificial intelligence

Lessons will be primarily designed for multiple live individuals (a team) participating together within the same training scenario, with a focus on team certification requirements. The use of automated role players and intelligent tutoring may be more limited than in lessons of lower level due to the increased participation of active participants, including the use of Instructors as role-players.

This type of training will essentially provide the virtual equivalent of a real-world simulator. The student will have the ability to alter settings and controls and other students within the scenario will be able to see the results of the change to the extent that such a change would normally be apparent. Selection of controls at incorrect times (out of sequence) will be permitted and effects may or may not be made immediately apparent to the student.