

INTRODUCTION: ADVANCED TECHNOLOGIES APPLIED TO TRAINING DESIGN

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The purpose of NATO workshops are “to establish active exchange of information among member nations and to stimulate the defense applications of research.” In 1985, NATO's Defense Research Group sponsored its first workshop on computer based training. During the next 6 years, there have been so many changes in technology, national priorities, and training needs that in 1991, a second workshop was held. This workshop covered advanced training technologies and the products that they could provide to the alliance. The workshop focused on the following 6 technological areas plus existing data base structures that could provide both researchers and practitioners with ready sources of information. The following six technological categories comprise the major sections of the book and are to serve as the initial entry points for the eventual data base:

1. AUTHORING SYSTEMS
2. MODELS
3. EMBEDDED TRAINING & SIMULATION
4. ADVANCED HARDWARE TECHNOLOGY
5. USE OF COGNITIVE APPROACHES
6. EXPERT SYSTEMS

Authoring systems was chosen because it is a very high cost driver for perhaps the most important factor of effective education and training. Most of this cost is driven by the amount of human involvement in traditional training development. This, when multiplied by the variations of procedures and the personal touches added to each course design, prevents the use of efficient authoring techniques. Computer aided techniques offer opportunities to overcome this problem.

The next three sections all relate to what some are calling the technological revolution of education and training. Each of these three categories has experienced exponential growth in capabilities due to the changes in computer and display technologies. Models, while a very imprecise and often misunderstood term, offer great opportunities to reduce error from variations in approach, offer standardized formats, and provide interoperability of training and education. Embedded training and simulation technologies now offer the operators an alternative to having to buy expensive dedicated training equipment. Such embedded training capabilities also offer the user the chance to choose if they want to use the real equipment with real signals or simulated signals. These decisions are decided on the basis of safety, environmental impact, and cost. Advanced hardware technology is often the limiting factor in the application of advanced training and education software. It was critical that researchers focus on what delivery system capabilities were anticipated to be available during the next decade. Without such planning, it is all too common to design a training capability that fails to meet the advances and constraints of the next generation delivery systems.