Training Scenarios for training games and simulations give learners hands on experience with complex domains. Scenarios may be difficult to author, often resulting in a small set of one-size-fits-all scenarios. However, a one-size-fits-all scenario may not address a particular learner's abilities, needs, or goals. It may force the learner to practice concepts with which he is already quite familiar and ignore concepts which require more practice.

Consider the Zone of Proximal Development (ZPD), as applied to training scenarios. The ZPD is the difference between the ability the learner has already demonstrated and the most difficult challenge the learner is able to overcome. The aim of our research is to intelligently change scenario data in order to maximize time the trainees spent in the ZPD.

Scenarios are similar to narratives. We employ plan-based narrative generation techniques. However, scenario adaptation has different requirements than narrative generation. New algorithms are required.

Scenario Adaptation Problem:
1. Include the 'best' set of events
   - Represent learning objectives
   - Add learning objectives to the scenario
   - Remove learning objectives and events from the scenario
   - Adjust difficulty by replacing events
2. Preserve consistency and coherence
   - Accommodating LLC violates consistency and coherence of original scenario
   - Decomposition from learning objectives to story world events. We use standard decomposition planning.
   - Eliminate 'Dead Ends' which result from scenario deletions and additions and adversely affect immersion. We have modified the planner to identify and search for ways to repair the scenario.

Example

Given a human-authored training scenario, and knowledge about the user.

How do we increase training effectiveness?
- Avoid unnecessary training
- Insert additional compatible learning objectives
- Adjust difficulty level

A Lifelong Learning Companion agent indicates the best generic scenario plus learning objectives.