

Foundations of Adaptive Learning (Personalized Learning)



LEARNING ENVIRONMENTS

LEARNER IMPACTS

- Self-regulation
- Achievement
- Motivation

DESCRIPTION

Research into adaptive learning has shown positive impact on learning, especially within micro-adaptive systems which have been demonstrated to be almost as effective as a human tutor (VanLehn, 2011). Adaptive learning technologies provide an environment that can intelligently adjust to individual learner needs by presenting appropriate information, instructional materials, scaffolds, feedback, and recommendations based on learner characteristics and particular situation.

Adaptive learning is broken up into five different categories:

1. Analytics: The base functionality that supports other forms of adaptive learning but may also be used to display important information to learners and instructors so they may adapt their own learning (Baker & Siemens, 2014).
2. Local: Targeted feedback, hints, and remedial content (Durlach & Ray, 2011).
3. Dispositional: Adaptation based on individual student variables such as aptitudes (Pashler, McDaniel, Rohrer, & Bjork, 2008).
4. Macro: Individualized task selection based on learner understanding (Lee & Park, 2008).
5. Micro: Individualized scaffolding mechanisms to assist learning (Corbett, Koedinger, & Anderson, 1997).

Such categories may be combined to provide greater levels of adaptive learning to support individual learners.

CAPABILITIES

- Adaptivity: Adaptive spacing
- Adaptivity: Adaptive study plan
- Adaptivity: Mastery and confidence based adaptivity

SAMPLE DESIGN IMPLEMENTATIONS

- Robust Technology: Personalized learning environment
- Simple Technology: Targeted study aids
- Content Support: Extensive content flexibility



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Foundations of Adaptive Learning (Personalized Learning) SELF-ASSESSMENT INSTRUMENT



Principle Criteria	Integration (4-5 points)	Exploration (2-3 points)	Consideration (1 point)	Not Applicable (0 Points)	Total Points
Definition	<p>Strong consideration for diversity in learners, methods, modes, media, and other factors</p> <p>Strong use of technology to facilitate the adaptation of learning experiences to individuals</p>	<p>Some consideration for diversity in learners, methods, modes, media, and other factors</p> <p>Some use of technology to facilitate the adaptation of learning experiences to individuals</p>	<p>Poor consideration for diversity in learners, methods, modes, media, and other factors</p> <p>Poor use of technology to facilitate the adaptation of learning experiences to individuals</p>	<p>Does NOT use effectively or is not a related activity</p>	= ____
Model	<p>Strong alignment between learning objectives and potential types of adaptivity, such as content agnostic, content level, and intelligent</p> <p>Strong implementation of micro, macro, and local adaptivity where appropriate in the learning design</p>	<p>Some alignment between learning objectives and potential types of adaptivity, such as content agnostic, content level, and intelligent</p> <p>Some implementation of micro, macro, and local adaptivity where appropriate in the learning design</p>	<p>Poor alignment between learning objectives and potential types of adaptivity, such as content agnostic, content level, and intelligent</p> <p>Poor implementation of micro, macro, and local adaptivity where appropriate in the learning design</p>	<p>Does NOT use effectively or is not a related activity</p>	= ____
Design	<p>Strong application of key adaptive learning principles:</p> <ul style="list-style-type: none"> • Misconception identification • Masterly learning • Varied feedback • Spaced practice • Self-regulated learning (SRL) • Shared control • Affective elements • Application variety • Segmented content • Signaling 	<p>Some application of key adaptive learning principles:</p> <ul style="list-style-type: none"> • Misconception identification • Masterly learning • Varied feedback • Spaced practice • SRL • Shared control • Affective elements • Application variety • Segmented content • Signaling 	<p>Poor application of key adaptive learning principles:</p> <ul style="list-style-type: none"> • Misconception identification • Masterly learning • Varied feedback • Spaced practice • SRL • Shared control • Affective elements • Application variety • Segmented content • Signaling 	<p>Does NOT use effectively or is not a related activity</p>	= ____
Assessment	<p>Strong use of timely and relevant feedback to facilitate learner improvement</p> <p>Strong use of data collection methods to support adaptivity, assessment, and feedback</p>	<p>Some use of timely and relevant feedback to facilitate learner improvement</p> <p>Some use of data collection methods to support adaptivity, assessment, and feedback</p>	<p>Poor use of timely and relevant feedback to facilitate learner improvement</p> <p>Poor use of data collection methods to support adaptivity, assessment, and feedback</p>	<p>Does NOT use effectively or is not a related activity</p>	= ____