E-Learning in the Human and Social Sciences
14-15 April, 2005

E-Learning: Instructional Design Comes First

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Presentation Outlines

1. What is e-learning?
2. Why use e-learning?
3. What is Instructional Design (ID)?
4. Why use ID?
5. Major Approaches to ID?
6. Incorporating ID Principles into e-learning
What is e-learning?

- Many definitions exist
- Covers a wide applications: Web-B/L, CBL, VC, DC, etc.
- Content delivery via: Internet, Intranet, ITV, Satellite, CD-ROM, etc.
- Learning mediated by an electronic medium (Driscoll, 2002, p.330)
- In practice, the Internet is the medium of choice (Tan & Hung, 2002, p.48)
E-Learning: The Marriage of Technology And Education

ID of e-content

Delivery System
- LMS
- e-portal

IS & Network
Why use e-learning?

1. Any time, any where learning (24/7)
2. Hypermedia delivery (non-linear)
3. Self-directed learning
4. Communication and collaboration tools
What is ID?

Behavioral ID:

1. The systematic development of instructional specifications using learning and instructional theories, and
2. The analyses of learning needs and goals and the development of a delivery system that meets those needs, and
3. The development of instructional materials and activities, and tryout and evaluation of all instructional and learner activities
What is ID?

Constructivist perspective:

The creation of educational environment that facilitates the construction of knowledge (Alessi & Trollip, 2001, p. 32)
Why use ID?

1. A learner advocacy (learner centered)
2. Effective, efficient, and appealing instruction
3. Team work coordination
4. Diffusion and adoption
5. Congruence among objectives, activities, and assessment
6. Alternative delivery
7. Pedagogy driven to use technology
8. A need driven
9. Both theoretical and empirical (eclectic)
ID and e-learning: Which Approach?

- Two Competing Philosophies
- Three Major Learning Theories
- Instructional Theories
ID Philosophical foundation

Objectivism  ID  Rationalism
Philosophical Foundations
A. Objectivism

- Reality exists objectively and independently of the individual
- Reductionalism: reducing complex entities to their simple components
- There exists common reality
- Knowledge is acquired through experience.
Philosophical Foundations

B. Rationalism (Constructivism)

1. Individual/cognitive constructivism:
   - Knowledge is individually constructed
   - Learning is constructed from experience
   - Knowledge results from a personal interpretation of experience
   - Learning is an active process
2. Social constructivism

- Learning is collaborative (co-constructed) through social and cultural context with meaning negotiated from multiple perspectives.
3. Contextualism:

- Learning should occur or be situated in realistic settings
- Testing should be integrated into the task, not a separate activity
### ID: Philosophical Framework

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<th>Objectivism</th>
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<td>Behaviorism</td>
<td>Cognitivism</td>
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<td><strong>Learning Goals</strong></td>
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<td>Autonomy</td>
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<td>Role of teacher</td>
<td>Authoritative</td>
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<td>Teaching method</td>
<td>Direct instruction (Transmission)</td>
<td>In-direct instruction (Transformative)</td>
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ID: Theoretical Foundation

Behaviorism

Cognitivism

Constructivism
Behaviorism

- Emphasis on observable behavior
- Reinforcement principles
- Corrective and immediate feedback
- Spaced practice: small tasks or steps
Cognivitism

- Emphasis on unobservable constructs,

- Attention $\rightarrow$ Perception $\rightarrow$ Encoding
  Memorizing $\rightarrow$ Comprehending

- Attention, Encoding, and Retrieval are key components of memory

- Emphasizes Active learning, Motivation, Locus of Control, Mental Models, Metacognition, Transfer of learning, and Individual Differences
Constructivism

- Knowledge construction
- Collaborative learning
- Self autonomy
- Active learning
- Authentic learning and assessment
- Personal relevance
- Learner reflection
- Discovery or guided discovery
- Multiple perspectives
ID and e-learning: Which Orientation?

- No single theoretical base provides complete prescriptive principles for the entire design process.
- Reasoned and validated eclecticism has been a key strength of ID (Smith & Ragan, 1999, p. vii)
- Majority of instructional designers prefer to merge various principles of beh., cog., and const. paradigms into one integrated approach (Alessi & Trollip, 2001, p. 17).
ID: an eclectic approach
Behaviorist ID: The ADDIE Model

- Design
- Development
- Evaluation
- Implementation
- Analysis
The ADDIE Model

**Analysis**: needs, audience, goals

**Design**: blueprint of instructional specifications

**Development**: production, tryout, formative evaluation (Alfa / Beta tests), final product

**Implementation**: technical & instructional, support, CM, evaluative data

**Evaluation**: summative, revision, recycle
Behaviorist/ Cognitivist ID: The Nine Events of Instruction (Gagne, 1985)

1. Gaining Attention (Reception)
2. Informing learner of the objectives (Expectancy, activating motivation)
3. Stimulating recall of prior learning (Retrieval)
4. Presenting the stimulus (Selective perception)
5. Providing learning guidance (Semantic Encoding)
6. Eliciting performance (Responding)
7. Providing feedback (Reinforcement)
8. Assessing performance (Retrieval)
9. Enhancing retention and transfer
Cognitivist/constructivist ID:
The Five Principles of Instruction

1. Problem
2. Activation
3. Demonstration
4. Application
5. Integration

David Merrill 2001
ID Strategies

Use Behavioral ID strategies for:

- Lower order thinking skills
- Stable, well defined content
- Mastery of content & discrete skills
- Promoting automatcity of prerequisite skills
- Remedy of weaknesses
- High motivated learners
ID Strategies

Use Cognitive ID Strategies for:

- Problem solving with defined facts & rules
- Tasks requiring an increased level of processing
ID Strategies

Use Constructivist ID Strategies for:

- ill-defined & complex content
- Tasks requiring high level of processing
- Learners with well developed metagognitive skills
- High and (low) motivated learners
Incorporating ID Principles into e-learning:

1. Motivate the learner: ARCS (Keller, J.M. 1983)

1.1. Attention:
- Questions & human interest examples
- Ample learner interaction
- Relevant graphic, animation, color & sound
- Short text elements
- Novelty to reduce predictability
- Visual & auditory effects for sensory curiosity
- Conflicting information for cognitive curiosity
- Consistent placement of screen items
Incorporating ID Principles into e-learning:

1. Motivate the learner: ARCS

1.2. Relevance:

- Use content & examples of interest or importance
- Use authentic experiences
- Present concepts & applications in meaningful context
- Match instruction with learning styles
Incorporating ID Principles into e-learning:

1. Motivate the learner: ARCS

1.3. Confidence: provide:

- Clear expectations
- Objectives & summary
- Note taking access
- Online support
- Positive expectation of success
Incorporating ID Principles into e-learning:
1. Motivate the learner: ARCS

1.4. Satisfaction: Provide:

- Learners with more navigation control
- Guidance, feedback, and self-check
- Assessment that matches objective and self-check to increase students, satisfaction of completion and intrinsic rewards
2. Require active involvement:

- Determine the amount of interpersonal exchange to meet e-course objectives
- Provide non-linear navigation
- Clearly communicate rules of interaction
- Ask students to compare, classify, induce, deduce, analyze errors,
- Involve students in discussion & demonstration
- Use case studies, portfolio & research reports
3. Support balanced learner control:

- Encourage learners to assume more responsibility for their learning

- Use project and problem based instruction
4. Encourage collaborative learning:

- Create a learning community (e-group projects via e-mail, Web-boards, discussion groups, e-mailing lists, etc.)
- Use Whiteboard for synchronous graphic sharing
- Use social chat rooms for synchronous text communication
5. Inform learners of objectives:

unless problem or discovery based learning is used:

- Include clear & measurable objectives
- Focus on objectives: include only most relevant & supportive Web sites
6. Activate prior leaning:

- Direct learners to recall, describe, or apply knowledge from past experience
- Provide links to relevant experiences
- Use learners’ profile to determine prerequisite
- Relate learners to previous lessons or modules
7. Provide guidance and feedback:

- Provide syllabus and timeline for assignment
- Provide timely and prompt feedback (email, posting reminder to course Web site)
- Present instruction in small steps (chunking)
- Focus attention on relevant information
8. Provide enrichment and remediation:

- Provide related links to relevant topics
- Recycle back through original materials
- Provide additional practices and links
- Alternate tests
9. Scaffolding:

- Provide advance organizer
- Demonstrate and fade gradually
- Provide guidance and feedback
10. Testing and evaluation:

- Use appropriate online or offline tests
- Use objective or subjective tests
- Use e-portfolio of artifacts
- Use Course Management Systems (WebCT, Blackboard) to keep students informed (gradebook)
- Use assessment techniques appropriate for learning tasks (Bloom Taxonomy)
- Use varied and frequent self-tests to guide the learner and provide feedback
11. Enhance learning transfer and integration

- Provide opportunities to relate learning to real life settings
- Provide opportunities for reflection
- Ask students to explore new ways to use their new knowledge and skills
E-Learning and Blended Learning

- E-Learning is well suited for cognitive skills
- Blended learning is appropriate for:
  - Psychomotor skills
  - Attitudinal skills
Recommendations

1. E-Learning solutions in the Human and Social sciences should be based on sound ID principles

2. Universities should provide training and professional development for faculty interested in exploring Web-based instruction

3. Universities should provide technical and instructional support for faculty teaching via Web-based instruction