INSTRUCTIONAL DESIGN

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WHAT IS INSTRUCTIONAL DESIGN?

Definition

“the systematic and reflective process of translating principles of learning and instruction into plans for instructional materials, activities, information resources, and evaluation (Smith & Ragan, 2005).

Seminal work in instructional design arises from systems theory

- Challenges reductionism; a system is greater than the sum of its parts.
- Equifinality – the end result of an open system can be achieved by a number of specific pathways that arise due to interactions with the environmental context.
- A general system is inherently a closed one, which leads to stability.

Systems theory is synthesized in:

Seminal work in systems theory
HOW ARE INSTRUCTIONAL DESIGN AND LEARNING THEORY DIFFERENT?

Learner characteristics versus design characteristics

• Instructional designers (ID) are guided by learning theory; Learning theories help IDs to understand how the mind of the learner works

• Educators (Subject Matter Experts- SMEs) can promote learning in their classrooms by working with IDs who know how systems work

An effective team includes both SMEs and IDs

• Example- an interior designer and an engineer are required to build a safe and comfortable home.

Selected Reading


Behaviorism

Biology drives human behavior without mental control; Response to stimuli is uncontrollable; Educational environments provide stimuli to facilitate learning (response)

Selected Reading

Cognitivism

Thinking impacts behavior and therefore, thinking is not a behavior; train the mind to learn by thinking

• Cognitive architecture is a reductionist principle

Selected Reading


Constructivism

Knowledge is accumulated through life experiences and self-reflection about those experiences

• Emergent learning arises (not reductionism)

Selected Reading


Merrill, M. D. (2002). First principles of instruction. Educational technology, research, and development, 50, 43-59.
SUMMARIZING LEARNING THEORIES


Your instructional plan must align with the educational goals for your students.

Don’t let this happen to you!

“Expect you all to be independent, innovative, critical thinkers who will do exactly as I say!”

www.partiallyexaminedlife.com

Image shows four perspectives on learning based upon theoretical principles. Instructional methods associated with each, adjacent to respective quadrant. Orange quadrants represent a student-focused learning approach, blue instructor-focused.
HOW DO EDUCATORS USE INSTRUCTIONAL DESIGN THEORY? (1 OF 3)

Master courses versus educator-designed courses

- The strongest applications of ID theory exist in master courses developed by ID and SME teams
- Educator-designed courses are potentially more creative but less accountable due to the impermanent course design

Technology-mediated learning

- Online and blended learning employ more ID theory because system design is central to learning success
- Juxtaposed to a expert scholar model in which the knowledge is held by the human professor and is transferred to the student through didactic instruction

Selected Reading

HOW DO EDUCATORS USE INSTRUCTIONAL DESIGN THEORY? (2 OF 3)

The course map

- A tool used in backwards design, aka the ADDIE model
- The course map links every course feature to a course learning outcome
- The instructional design is illustrated in the course map

Selected Reading


Example:

You can not get to the 18th hole without a well-planned golf course that links one hole to the next….and of course it would do you no good to try for the 18th hole without traveling the “course.”
Academic accountability

- In the Era of Mass Education, accountability is a central principle.
- ID provides accountable reasoning for course design.
- Using ID theory solidifies the connection between effective instruction and student retention.
- None of this was necessary in the traditional American academic model where the elite professor controlled the educational experience with little oversight.

Reading about the history of American higher education

INSTRUCTIONAL DESIGN MODELS

A glimpse of what is possible
THE ADDIE MODEL

Lead with assessment
• The ADDIE model is a ID design strategy in which designers first develop assessments aligned to course learning outcomes
• The course map is where this alignment is published

The role of the educator
• The educator carries out the instructional design
• May or may not be part of the design process depending on whether or not the educator teaching the course is also the SME

Technology applications
• Online education is facilitated by the purposeful use of the ADDIE model in course design

Media applications
• The ADDIE model identifies media applications as part of the designed learning activities for a course

Selected reading
INFORMATION PROCESSING THEORY

Information processing theory arises from

- Cognitivism and behaviorism (procedural knowledge)
- Brain biology
  In order to deepen knowledge, the information needs to be held in the working memory long enough to transfer information into the long-term memory

The role of the educator

- The educator stimulates the learner with discussion and learning activities intended to increase the time during which a student interacts with the information to be processed

Technology applications

- Adaptive study resources developed by textbook publishers provide excellent control of information processing

Media applications

- Multimodal learning activities increase information processing by delivering information with auditory, visual and kinesthetic stimuli

Selected Reading


I asked my daughter what learning was and she described this treasure chest...not too bad for a seven-year old.
THE 5E MODEL OF SCIENCE INSTRUCTION

The 5E model arises from:

- Constructivism and cognitivism
- Inquiry-based learning

The role of the educator:

- The educator engages, guides, and assesses students
- By following the model repeatedly in a classroom, cognitive apprenticeship ensues as students discover that the 5Es are process of thinking

Technology applications:

- Formative activities can be adapted to online or hybrid classrooms
  - Engage - didactic instruction delivered online (ex. Bozeman Science)
  - Explore - lab activities at home for online students
  - Explain - online discussions

Media applications:

- Media-based engagement tools are a great way to introduce a student to a learning topic
- Media-based assessments offer opportunities for student collaboration and competency demonstration

<table>
<thead>
<tr>
<th>Engage</th>
<th>These activities mentally engage the students with an event or question. Engagement activities help students make connections with what they know and can do.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explore</td>
<td>Students work with one another to explore ideas through hands-on activities. This exploration provides a set of common experiences for all learners. Under the guidance of the teacher, students begin to clarify their understanding of major concepts and skills.</td>
</tr>
<tr>
<td>Explain</td>
<td>Students construct explanations of the concepts and processes about which they are exploring and learning. Teachers clarify students' understanding of concepts and help them develop skills.</td>
</tr>
<tr>
<td>Elaborate</td>
<td>These lessons challenge students to apply what they have learned to a new situation and to build on the students' understanding of concepts in ways that extend their knowledge and skills.</td>
</tr>
<tr>
<td>Evaluate</td>
<td>Students assess their own knowledge, skills, and abilities. These lessons also allow teachers to evaluate students' progress and inform instruction.</td>
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Selected Readings:


WHAT INSTRUCTIONAL DESIGN RESOURCES ARE AVAILABLE TO EDUCATORS?

Leading Internet resource

- Instructional Design Central

Professional organizations

- In addition to those listed here, social media groups
  - LinkedIn

http://www.instructionaldesigncentral.com/htm/IDC_instructionaldesignmodels.htm
TAKE HOME MESSAGES

What is a teaching philosophy?
When asked to write a teaching philosophy, think about your perspectives on how students learn.
• Don’t be too dogmatic – there is room for a little of everything

What is an instructional model?
When asked to design a course, think about what your students will have to learn and what they will be required to do to demonstrate their learning.
• Don’t be too dogmatic – there is room for a little of everything

Experience Counts! Constructivism is real.
Don’t let the literature bully you around. Instead, think about what you do and how that fits with the theories you read. This is a self-supportive approach.


