

Notes on the design of learning

By Glenn Martin

Learning design is known as instructional design, or instructional systems design (ISD). It is a planning and structuring process that analyses employee performance systematically, determines learning needs and objectives, designs instructional components and develops methodologies for delivering learning in order to achieve the objectives.

Instructional design comes into play when it has been determined that a gap between actual and desired performance is most appropriately met through a learning initiative (rather than another action, such as job redesign or job aids).

There are many models used for structuring the design process. Gustafson and Branch's "Survey of instructional development models" (1998) included 18 models, and their list was not exhaustive. Some of the popular models are described briefly here.

ADDIE

Perhaps the most popular model for instructional design is the **ADDIE** model. The letters stand for five phases of the design process:

- Analysis
- Design
- Development
- Implementation
- Evaluation

Each phase of the model is made up of different procedural steps. For example, Analysis typically consists of an analysis of needs, the learner group, the work context and the learning content. Authors of books that apply the ADDIE model include Chuck Hodell (2000) and Saul Carliner (2003) (see references below).

Practitioners and academics differ on whether the model is strictly sequential (eg you must finish Analysis before you start on Design) or whether there may be movement back and forth between the phases, in an evolutionary creation of the final product.

Endorsed instructional design process

Rothwell and Kazanas (1992) present the model that is endorsed by the International Board of Standards for Training, Performance and Instruction.

1. Conduct a needs assessment	Identify gaps between actual and desired performance and determine causes.
2. Assess relevant learner characteristics	Define target employees; assess their knowledge, skills, attitudes; determine their learning characteristics.
3. Analyse factors in workplace setting	Determine how the work environment affects current performance, and how it will affect learning and application of new skills.
4. Perform analyses of job, task and content	Collect data on required tasks for current or new jobs, and identify requirements for competency.
5. Write statements of performance objectives	Describe desired outcomes of training process.
6. Develop performance measurements	Identify methods of defining achievement of performance.
7. Sequence performance objectives	Arrange order in which topics should be learned.
8. Specify instructional strategies	Select approaches which will facilitate learning and achievement of objectives.
9. Design instructional materials	Select or devise materials that support teaching strategy.
10. Evaluate instruction	Carry out formative evaluation to confirm program's effectiveness.

See <http://www.ibstpi.org/>

Design and development process

Start-up	<ul style="list-style-type: none">▪ Project plan and scope▪ Requirements	<ul style="list-style-type: none">▪ Design approach and methodology
Analysis & Design	<ul style="list-style-type: none">▪ Content pack (Topic level objectives, outline and content)▪ User Interface Design▪ Storyboard	<ul style="list-style-type: none">▪ Prototype
Develop	<ul style="list-style-type: none">▪ Scripts and voice-overs▪ Media assets	<ul style="list-style-type: none">▪ Functional courseware (Alpha version)
Test & Deploy	<ul style="list-style-type: none">▪ Functional Courseware with changes implemented	<ul style="list-style-type: none">▪ Courseware available within LMS

(Source: Appcon)

The Sequential Iterative Model (SIM)

SIM is advocated by Michael Milano and Diane Ullius. They describe their model as a non-linear model for training design. Its strength is that it addresses what is an invariable tension in training between structure and flow. On one hand, participants need structure in order to make sense of training and therefore achieve the objectives. But on the other hand, training also has to exhibit a dynamic flow and interactivity with participants, in order to retain attention. SIM is intended to accommodate this tension at the design stage. The central feature of SIM is the feedback loop which enables you to continually refine your training based on experience.

Nine conditions of learning

One of the original thinkers on learning design was Robert Gagné, an American educational psychologist who pioneered the science of instruction during World War II for the air force with pilot training. He developed a list of nine conditions of learning, which are instructional events that should be used in every complete act of learning.

1. Gain the learner's attention.
2. Share the objectives of the session.
3. Ask learners to recall prior learning.
4. Deliver the content.
5. Use methods to enhance understanding, eg case studies, diagrams.
6. Provide an opportunity to practise.
7. Provide feedback.
8. Assess performance.
9. Provide job aids or references to ensure transfer to the job.

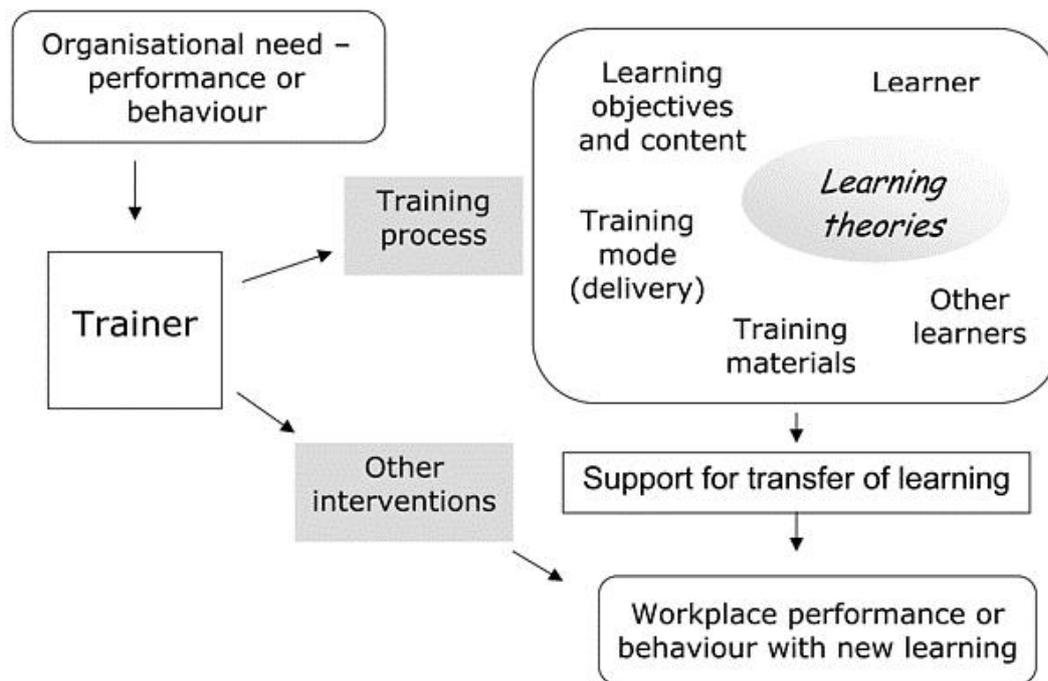
Basic principles

As well as step-by-step models for design of learning initiatives, some basic principles to guide instructional design are useful. The importance of some principles may fluctuate according to the type of learning applicable, but all are relevant if instructional design is to be effective. Instructional design should be:

- comprehensive
- standardised
- job-related (addressing skills critical for effective job performance)
- relevant
- reliable
- internally consistent (so that subsequent tasks can build on earlier ones)
- applicable to varied jobs
- applicable to varied audiences, and
- applicable to varied needs and types of training and development.

Instructional design, learning theory and new technology

Instructional design is strongly influenced by learning theories and by evolving technologies. Learning theories affect the approach that is taken – is the theory underlying the training behaviourist, cognitive, constructivist...? Some people are now arguing that the prevalence of new technologies is actually changing how people learn, so the design process itself has to be open to renewed scrutiny. The diagram shows the major factors affecting design of learning initiatives.



New Flexible Framework material on design of e-learning

A new resource, the *Practical guide to e-learning for industry*, is available on the Australian Flexible Learning Framework's website. It is a content-rich online resource intended for the use of people working in industry. The guide was prepared by the Industry Engagement Project. It is a comprehensive package of information, checklists and links that will help businesses, large or small, to get started in e-learning, or to improve existing e-learning programs.

Go to: <http://industry.flexiblelearning.net.au>

A second Framework resource is the website "Designing e-learning". This site provides some answers to the questions: What is e-learning? and How do you do it?

The site contains a gallery of strategies with over 100 click-and-view samples plus teaching guides, and sections on learning design and learning materials. The latter offer detailed sample designs and course maps.

There are a range of different e-tours through the resources on the site to get people started.

Go to: <http://designing.flexiblelearning.net.au>

Books on design of learning

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Gustafson K and Branch R (1998) *Survey of Instructional Development Models*, 3rd ed., ERIC Clearing House on Information and Technology, Syracuse NY.

Hodell C (2000) *ISD From the Ground Up: A No-Nonsense Approach to Instructional Design*, American Society for Training & Development, Alexandria VA.

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Milano M and Ullius D (1998) *Designing Powerful Training: The Sequential Iterative Model (SIM)*, Jossey-Bass, San Francisco.

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