



The Key Principles of e-learning and Models used in e-learning

Notes



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Key Principles of E-Learning

1. Match to the Curriculum/ Business Plan/ Strategy/ Project.

- Clear objectives (at appropriate level)
- Relevance of content to be covered
- Appropriateness of content for the learners
- Nature of assessment (where appropriate)

2. Inclusion

The e-learning solution should support inclusive practice in terms of:

- Different types and range of achievement (including special needs)
- Physical disabilities that can be supported by e-learning (e.g. Visual and hearing impairment, dyslexia etc.)
- Different social and ethnic groups
- Gender

3. Learner Engagement

The e-learning solution should engage and motivate learners. The engagement should be evident by:

- Being educational and having a worthwhile educational aim (*not just to occupy or entertain learners- although there may be 'game like' approaches*).
- Motivating – *To inspire the learner to want to carry on with the topic and enjoyable to make them want to carry on with the e-learning approach.*
- Being developed in such a way it does not produce adverse emotional reactions- *that are likely to cause reduced motivation.*

4. Innovative Approaches

- It should be evident why learning technologies are being used.
- E-learning should be used where it brings an innovative approach which can't be achieved in another way.
- The design and implementation of digital material or environment may be innovative.

5. Effective Learning

This can be demonstrated in a variety of ways:

- The use of a range of approaches that enables the learner to choose the style of learning most suited to their style (or will extend the learner's repertoire of approaches to learning).
- By providing evidence of the characteristics of good learning (learner autonomy, encourages metacognitive (including higher order) thinking; enables or encourages collaboration).
- By providing evidence of effective outcomes of the learning intervention and digital media used (such as an LMS system)
- By providing authentic learning that also exhibits multiple perspectives on a topic.

6. Formative Assessment

- The e-learning solutions should provide formative assessments that are aimed at improving learning.
- Provision of rapid feedback to help the learner see how they can improve and what they must do to improve;
- Provision of opportunities for peer assessment (with appropriate understanding of the criteria or standards of performance required)
- Provision of opportunities for self assessment (with appropriate understanding of the criteria or standards of performance required)

7. Summative Assessment

- Summative assessment are things like grading students, providing test results that can be linked to performance/ work opportunities, obtaining test scores, examinations and certificates.
- A means to assess that the objectives meet the aims.
- A means of obtaining consistent results.
- A means of validating tests.

8. The E-learning solution should be consistent, coherent and transparent

- The e-learning solution should be internally coherent in the way the objectives, content, learner activities and assessment (where relevant) link in a logical way to each other.
- The activities should be consistent with the objectives.
- It should be very clear to the learner what they are expected to do.

9. Easy to use

In addition to being transparent in its intention e-learning should be transparent in its ease of use through:

- Being open and accessible
- Being intuitive and not requiring guidance from the teacher and intensive training or instructions for the learner
- Consideration should be given to the IT skills of the target audience

10. Cost Effective

- E-learning is not cheap to develop and the investment needs to be justified in terms of savings through cost benefits, capacity building, meeting educational needs and goals that are not easily achievable in other ways, broadening choice and raising standards;

Models of e-learning

ADDIE Model

Summary: The ADDIE model is a systematic instructional design model consisting of five phases: (1) Analysis, (2) Design, (3) Development, (4) Implementation, and (5) Evaluation. Various flavors and versions of the ADDIE model exist.

Originator: Unknown. Refined by Dick and Carey and others.

Key terms: Analysis, Design, Development, Implementation, Evaluation

ADDIE Model

The generic term for the five-phase instructional design model consisting of Analysis, Design, Development, Implementation, and Evaluation. Each step has an outcome that feeds into the next step in the sequence. There are probably over 100+ different variations of the generic ADDIE model.

The five phases of ADDIE are as follows:

Analysis

- During analysis, the designer identifies the learning problem, the goals and objectives, the audience's needs, existing knowledge, and any other relevant characteristics. Analysis also considers the learning environment, any constraints, the delivery options, and the timeline for the project.

Design

- A systematic process of specifying learning objectives. Detailed storyboards and prototypes are often made, and the look and feel, graphic design, user-interface and content is determined here.

These are steps used for the design phase:

- Documentation of the project's instructional, visual and technical design strategy
- Apply instructional strategies according to the intended behavioral outcomes by domain (cognitive, affective, and psychomotor).
- Design the user interface and user experience
- Prototype creation
- Apply visual design (graphic design)
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Development

- The actual creation (production) of the content and learning materials based on the Design phase.
- The development phase is where instructional designers and developers create and assemble the content assets that were blueprinted in the design phase. In this phase, storyboards are created, content is written and graphics are designed. If e learning is involved, programmers work to develop and/or integrate technologies. Testers perform debugging procedures. The project is reviewed and revised according to any feedback given.

Implementation

- During implementation, the plan is put into action and a procedure for training the learner and teacher is developed. Materials are delivered or distributed to the student group. After delivery, the effectiveness of the training materials is evaluated.

Evaluation

- This phase consists of (1) formative and (2) summative evaluation. Formative evaluation is present in each stage of the ADDIE process. Summative evaluation consists of tests designed for criterion-related referenced items and providing opportunities for feedback from the users. Revisions are made as necessary.

Rapid prototyping (continual feedback) has sometimes been cited as a way to improve the generic ADDIE model.

For more information, see:

- Dick, W., & Carey, L. (1996). *The Systematic Design of Instruction* (4th Ed.). New York: Haper Collins College Publishers.
- Leshin, C. B., Pollock, J., & Reigeluth, C. M. (1992). *Instructional Design Strategies and Tactics*. Englewood Cliffs, NJ: Education Technology Publications.

ARCS Model of Motivational Design (Keller)

Summary: According to John Keller's ARCS Model of Motivational Design, there are four steps for promoting and sustaining motivation in the learning process: Attention, Relevance, Confidence, Satisfaction (ARCS).

Originator: John Keller

Key terms: Attention, Relevance, Confidence, Satisfaction (ARCS)

ARCS Model of Motivational Design (Keller)

1. Attention

- Keller attention can be gained in two ways: (1) Perceptual arousal - uses surprise or uncertainty to gain interest. Uses novel, surprising, incongruous, and uncertain events; or (2) Inquiry arousal - stimulates curiosity by posing challenging questions or problems to be solved.
- Methods for grabbing the learners' attention include the use of:
 - Active participation - Adopt strategies such as games, roleplay or other hands-on methods to get learners involved with the material or subject matter.
 - Variability - To better reinforce materials and account for individual differences in learning styles, use a variety of methods in presenting material (e.g. use of videos, short lectures, mini-discussion groups).
 - Humor - Maintain interest by use a small amount of humor (but not too much to be distracting)
 - Incongruity and Conflict - A devil's advocate approach in which statements are posed that go against a learner's past experiences.
 - Specific examples - Use a visual stimuli, story, or biography.

- Inquiry - Pose questions or problems for the learners to solve, e.g. brainstorming activities.

2. Relevance

- Establish relevance in order to increase a learner's motivation. To do this, use concrete language and examples with which the learners are familiar. Six major strategies described by Keller include:
 - Experience - Tell the learners how the new learning will use their existing skills. We best learn by building upon our preset knowledge or skills.
 - Present Worth - What will the subject matter do for me today?
 - Future Usefulness - What will the subject matter do for me tomorrow?
 - Needs Matching - Take advantage of the dynamics of achievement, risk taking, power, and affiliation.
 - Modeling - First of all, "be what you want them to do!" Other strategies include guest speakers, videos, and having the learners who finish their work first to serve as tutors.
 - Choice - Allow the learners to use different methods to pursue their work or allowing s choice in how they organize it.

3. Confidence

- Help students understand their likelihood for success. If they feel they cannot meet the objectives or that the cost (time or effort) is too high, their motivation will decrease.
- Provide objectives and prerequisites - Help students estimate the probability of success by presenting performance requirements and evaluation criteria. Ensure the learners are aware of performance requirements and evaluative criteria.
- Allow for success that is meaningful.
- Grow the Learners - Allow for small steps of growth during the learning process.
- Feedback - Provide feedback and support internal attributions for success.
- Learner Control - Learners should feel some degree of control over their learning and assessment. They should believe that their success is a direct result of the amount of effort they have put forth.

4. Satisfaction

- Learning must be rewarding or satisfying in some way, whether it is from a sense of achievement, praise from a higher-up, or mere entertainment.
- Make the learner feel as though the skill is useful or beneficial by providing opportunities to use newly acquired knowledge in a real setting.
- Provide feedback and reinforcement. When learners appreciate the results, they will be motivated to learn. Satisfaction is based upon motivation, which can be intrinsic or extrinsic.
- Do not patronize the learner by over-rewarding easy tasks.

For more information, see:

- Keller, J. M. (1983). Motivational design of instruction. In C. M. Reigeluth (Ed.), *Instructional-design theories and models: An overview of their current status*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Keller, J. M. (1984). The use of the ARCS model of motivation in teacher training. In K. Shaw & A. J. Trott (Eds.), *Aspects of Educational Technology Volume XVII: staff Development and Career Updating*. London: Kogan Page.
- Keller, J. M. (1987). Development and use of the ARCS model of motivational design. *Journal of Instructional Development*, 10(3), 2-10. [John Keller's Official ARCS Model Website](#)

Experiential Learning (Kolb)

Summary: A four-stage cyclical theory of learning, Kolb's experiential learning theory is a holistic perspective that combines experience, perception, cognition, and behavior.

Originators: David A. Kolb (1939-)

Key Terms: Learning cycles, learning styles, concrete experience, reflective observation, abstract conceptualization, active experimentation

Experiential Learning (Kolb)

Building upon earlier work by John Dewey and Kurt Levin, American educational theorist David A. Kolb believes "learning is the process whereby knowledge is created through the transformation of experience" (1984, p. 38). The theory presents a cyclical model of learning, consisting of four stages shown below. One may begin at any stage, but must follow each other in the sequence:

- concrete experience (or "DO")
- reflective observation (or "OBSERVE")
- abstract conceptualization (or "THINK")
- active experimentation (or "PLAN")

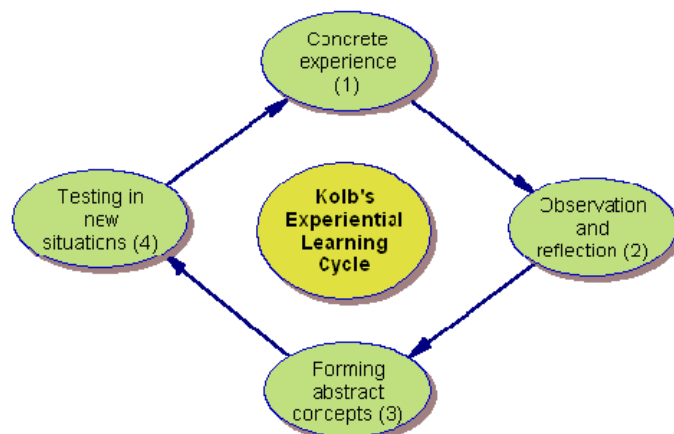


Figure 1. Kolb's Experiential Learning Cycle.

Kolb's four-stage learning cycle shows how experience is translated through reflection into concepts, which in turn are used as guides for active experimentation and the choice of new experiences. The first stage, *concrete experience* (CE), is where the learner actively experiences an activity such as a lab session or field work. The second stage, *reflective observation* (RO), is when the learner consciously reflects back on that experience. The third stage, *abstract conceptualization* (AC), is where the learner attempts to conceptualize a theory or model of what is observed. The fourth stage, *active experimentation* (AE), is where the learner is trying to plan how to test a model or theory or plan for a forthcoming experience.

Kolb identified four learning styles which correspond to these stages. The styles highlight conditions under which learners learn better. These styles are:

- assimilators, who learn better when presented with sound logical theories to consider
- convergers, who learn better when provided with practical applications of concepts and theories
- accommodators, who learn better when provided with "hands-on" experiences
- divergers, who learn better when allowed to observe and collect a wide range of information

For more information, see:

- Kolb, David A. 1984. *Experiential Learning: Experience as the Source of Learning and Development*. Prentice-Hall, Inc., Englewood Cliffs, N.J.

Gagnes Nine Events of instruction

Robert Mills Gagné (August 21, 1916– April 28, 2002) was an American educational psychologist best known for his "Conditions of Learning". Gagné pioneered the science of instruction during WWII for the air force with pilot training. Later he went on to develop a series of studies and works that helped codify what is now considered to be 'good instruction.' He also was involved in applying concepts of instructional theory to the design of computer based training and multimedia based learning.

A major contribution to the theory of instruction was the model "Nine Events of Instruction".

- **Gain attention**
- **Inform learner of objectives**
- **Stimulate recall of prior learning**
- **Present stimulus material**

- **Provide learner guidance**
- **Elicit performance**
- **Provide feedback**
- **Assess performance**
- **Enhance retention transfer**

Gagné's work is sometimes summarized as **the Gagné Assumption**. The assumption is that different types of learning exist, and that different instructional conditions are most likely to bring about these different types of learning

Gagne's book, *The Conditions of Learning*, first published in 1965, identified the mental conditions for learning. These were based on the information processing model of the mental events that occur when adults are presented with various stimuli. Gagne created a nine-step process called the events of instruction, which correlate to and address the conditions of learning. The figure below shows these instructional events in the left column and the associated mental processes in the right column.

Instructional Event	Internal Mental Process
1. Gain attention	Stimuli activates receptors
2. Inform learners of objectives	Creates level of expectation for learning
3. Stimulate recall of prior learning	Retrieval and activation of short-term memory
4. Present the content	Selective perception of content
5. Provide "learning guidance"	Semantic encoding for storage long-term memory
6. Elicit performance (practice)	Responds to questions to enhance encoding and verification
7. Provide feedback	Reinforcement and assessment of correct performance
8. Assess performance	Retrieval and reinforcement of content as final evaluation
9. Enhance retention and transfer to the job	Retrieval and generalization of learned skill to new situation

Gagnes theory in practice:

1. Gain attention

In order for any learning to take place, you must first capture the attention of the student. A multimedia program that begins with an animated title screen sequence accompanied by sound effects or music startles the senses with auditory or visual stimuli. An even better way to capture students' attention is to start each lesson with a thought-provoking question or interesting fact. Curiosity motivates students to learn.

2. Inform learners of objectives

Early in each lesson students should encounter a list of learning objectives. This initiates the internal process of expectancy and helps motivate the learner to complete the lesson. These objectives should form the basis for assessment and possible certification as well. Typically, learning objectives are presented in the form of "Upon completing this lesson you will be able to. . . ."

3. Stimulate recall of prior learning

Associating new information with prior knowledge can facilitate the learning process. It is easier for learners to encode and store information in long-term memory when there are links to personal experience and knowledge. A simple way to stimulate recall is to ask questions about previous experiences, an understanding of previous concepts, or a body of content.

4. Present the content

This event of instruction is where the new content is actually presented to the learner. Content should be chunked and organized meaningfully, and typically is explained and then demonstrated. To appeal to different learning modalities, a variety of media should be used if possible, including text, graphics, audio narration, and video.

5. Provide "learning guidance"

To help learners encode information for long-term storage, additional guidance should be provided along with the presentation of new content. Guidance strategies include the use of examples, non-examples, case studies, graphical representations, mnemonics, and analogies.

6. Elicit performance (practice)

In this event of instruction, the learner is required to practice the new skill or behavior. Eliciting performance provides an opportunity for learners to confirm their correct understanding, and the repetition further increases the likelihood of retention.

7. Provide feedback

As learners practice new behavior it is important to provide specific and immediate feedback of their performance. Unlike questions in a post-test, exercises within tutorials should be used for comprehension and encoding purposes, not for formal scoring. Additional guidance and answers provided at this stage are called formative feedback.

8. Assess performance

Upon completing instructional modules, students should be given the opportunity to take (or be required to take) a post-test or final assessment. This assessment should be completed without the ability to receive additional coaching, feedback, or hints. Mastery of material, or certification, is typically granted after achieving a certain score or percent correct. A commonly accepted level of mastery is 80% to 90% correct.

9. Enhance retention and transfer to the job

Determining whether or not the skills learned from a training program are ever applied back on the job often remains a mystery to training managers - and a source of consternation for senior executives. Effective training programs have a "performance" focus, incorporating design and media that facilitate retention and transfer to the job. The repetition of learned concepts is a tried and true means of aiding retention, although often disliked by students. Creating electronic or online job-aids, references, templates, and wizards are other ways of aiding performance.

Applying Gagne's nine-step model to any training program is the single best way to ensure an effective learning program. A multimedia program that is filled with glitz or that provides unlimited access to Web-based documents is no substitute for sound instructional design. While those types of programs might entertain or be valuable as references, they will not maximize the effectiveness of information processing - and learning will not occur.

Resource- Course Lesson Planner

Overall Course Objectives:

- 1.
- 2.
- 3.

Lesson titles and sequence that will form the overall course:

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

Individual Lesson Plan (copy as many times as necessary for each lesson):

Lesson Title:		
Instructional Events (prompts)	Objectives and Content	Interactions/ Animations
Gain attention	Objective: Content:	Introduction to e-learning & Knowledge Presenter
Inform learner of objectives	Objective: Content:	
Stimulate recall of prior learning	Objective: Content:	

Present stimulus material	Objective: Content:	
Provide learner guidance	Objective: Content:	
Elicit performance	Objective: Content:	
Provide feedback	Objective: Content:	
Assess performance	Objective: Content:	
Enhance retention transfer	Objective: Content:	

Certificate wording:

This is to certify that
(name)
has successfully completed a course in
XXXXXX
on
(Date in words and numbers)

LOGO

