

# **Instructional Design for Online Learning**

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# Instructional Design for Online Learning

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Instructional design is a scientific system grounded in research-tested learning theory that is used to create detailed specifications for the development, implementation, evaluation, and ongoing management of environments, resources, and procedures that encourage and support learning of both large and small units of subject matter at all levels of complexity.

## ***Instructional Design Process***

**Instructional Design** involves:

- Identifying a learning need or purpose
- Acquiring an understanding of the context of that need or purpose—including:
  - the institutional culture
  - target audience
  - pre-instruction knowledge level of participants
  - available resources
  - time table.
- Designing instruction to meet that need or purpose
- Developing the materials and methods to deliver the instruction
- Evaluating the delivery and the learning outcomes of the instruction.

## ***Instructional Design Theories***

A theory attempts to describe the processes underlying a complex phenomenon. There are dozens of theories about learning that have guided thousands of research projects, with an ever increasing level research activity since the 1970s. To learn more about some of these theories, visit the Theory Into Practice Database located at <http://www.gwu.edu/~tip/> or click on any of the following links to learn more about the theories that are of particular applicability to creating a successful online learning experience.

- [Adult Learning Theory \(P. Cross\)](#)
- [Andragogy \(M. Knowles\)](#)
- [Conditions of Learning \(R. Gagne\)](#)
- [Constructivist Theory \(J. Bruner\)](#)
- [Double Loop Learning \(C. Argyris\)](#)
- [Experiential Learning \(C. Rogers\)](#)
- [Genetic Epistemology \(J. Piaget\)](#)
- [Multiple Intelligences \(H. Gardner\)](#)
- [Operant Conditioning \(B.F. Skinner\)](#)
- [Social Development \(L. Vygotsky\)](#)

## ***Instructional Design Models***

A model is typically used to simplify a theory and make it more understandable. Click here [http://futureu.net/braxton/instruction\\_models.html](http://futureu.net/braxton/instruction_models.html) to learn more about some of the numerous Instructional Design Models derived from research based on instructional design theories, or click on any of the links below for a particular model.

- [Dick and Carey](#)
- [Hannifan and Peck](#)
- [Knirk and Gustafson](#)
- [Jerrold Kemp](#)
- [Gerlach and Ely](#)
- [Rapid Prototyping](#)

The learning theories mentioned above have guided the development of a wide variety of instructional design models that have further guided numerous research projects in instructional design (see sidebar), but two instructional design models in particular deserve attention for their direct applicability to online learning: ADDIE and COSE.

### **The ADDIE Instructional Design Model**

**[<http://www.fbe.unsw.edu.au/learning/instructionaldesign/materials.htm>]**

The ADDIE model reflects an attempt to synthesize the most common elements of many instructional design models into a single, simple to apply model. ADDIE is an acronym that stands for:

- Analysis
- Design
- Development
- Implementation
- Evaluation

Click here to learn more about ADDIE:

[<http://www.fbe.unsw.edu.au/learning/instructionaldesign/materials.htm>]

The ADDIE model adopts the widespread understanding that instructional design should be learner-centered and focus primarily on creating an environment and activities that lead to collaboratively determined learning outcomes.

In higher education, the learner-centered approach can still be used, but is modified to take into consideration the learning objectives that experts (usually a faculty curriculum committee) have determined are necessary to demonstrate expertise in a given subject.

The **analysis** stage of ADDIE asks these specific questions:

- Who is your audience? (Who are your learners?)
- What is the purpose of the instruction?

- What knowledge, skills, or attitudes must be taught?
- How much can you cover within the constraints for the learning unit in question (e.g., tutorial, workshop, course, program, degree, etc.)?

The **design and development** phases of ADDIE ask these specific questions:

- What are the learning objectives?
- What resources and strategies will be used?
- How will the content be structured?
- How will learning outcomes be assessed?

**Implementation** involves creation of the learning environment and delivery of the materials designed and developed in the previous phases.

**Evaluation** is an ongoing part of the learning unit beginning with the analysis phase and continuing through the entire process. The findings from evaluation are used both to improve the learning unit for future learners and to help current learners design their own future learning goals.

### The COSE Pedagogical Model

[<http://www.staffs.ac.uk/COSE/cose10/pedmodel.html>]

COSE was developed at Staffordshire University in the UK and the acronym stands for the "Creation Of Study Environments."

The COSE model breaks learning into three levels:

1. Primary
2. Secondary
3. Advanced

Then it organized each of these levels into three elements:

1. Learning Objectives
2. Learning Activities Or Environments
3. Learning Outcomes Or Skills.

Each course or learning project is made up of a set of tasks. Each task is described within a set of one or more Web pages that contain a statement of the task, its learning objectives, as well as instructions for solving the task and any theoretical notes that might be applicable. Navigation aids are present and graphic images or audio and video clips may be included as applicable as well as links to other parts of the learning project.

The COSE model is summarized in the following table. For more details, click here.

[<http://www.staffs.ac.uk/COSE/cose10/pedmodel.html>]

### The COSE Instruction Design Model

|                    | Learning Objects   | Learning Activities or Environments  | Learning Outcomes or Skills  |
|--------------------|--|--|--|
| Primary Learning   | Procedure, Instruction, Skill                                  | Information, Explanation, Knowledge  | Cognition, Focus, Intellect  |
| Secondary Learning | Case, Exemplar, Interpretation                                 | Problem-based Learning (with support material, group work, and tutor guidance) | Know How, Competence, Understanding                                    |
| Advanced Learning  | Learning Proposal (informed by primary and secondary learning) | Learning Project (involving tutor feedback and collaborative learning)         | Demonstrated Expertise (in project management and autonomous learning) |

### FutureU's Instructional Design Model for Online Learning

There is more to online learning than simply moving existing course materials onto the Internet. The most successful online learning designs incorporate the unique learning requirements of adults. At *FutureU* our experience with adult learning online has taught us to pay close attention to the following principles of adult learning:

1. Over a third of today's student population are working adults. The rest will be within a few years of entering college.
2. Adults, whether students, employed, or self-employed, are a highly diverse group with different preferences, needs, backgrounds, and skills.
3. People rely heavily on their own experience as a major resource in any learning situation.
4. Adults learn best when they can reflect, analyze, discuss, collaborate to solve problems, and apply what they are learning to real-world situations.
5. Most adults can learn to stop depending on instructors and external motivators and start depending on themselves and their own motivation to learn, centered on the skills of self-directed learning and the creation of explicit learning plans.
6. Effective learning environments support the learner in defining individual needs both in terms of immediate needs and in terms of identifying the underlying assumptions or mental models that influence and shape personal needs.
7. Successful learning programs help learners to assume increasing personal responsibility for defining their learning objectives, planning their own learning programs, and mastering the art of self-evaluation and do this while simultaneously meeting their individual work requirements and personal growth needs.
8. Effective training helps learners understand how to use the experiences of others as learning resources, how to engage others in reciprocal learning relations, and how to integrate the perspectives of others with alternative ways of understanding into current learning.

9. People learn best when they take part in purposeful groups, such as work teams, organizations, and communities. When newcomers join the group, effective participation keeps what is known alive, creating what could be called a "group practice."
10. People change their patterns of participation as the group accomplishes its purpose across time creating "group learning."
11. A successful learning team, learning organization, or learning community usually has loose boundaries but a clear mission are usually immersed in an environment that fosters the learning of group practices and creates performance and member satisfaction that is superior to groups with strict boundaries and rules and unclear missions.

Taking the key design cycle stages described by ADDIE and COSE, as well as most instructional design theories and models, FutureU has devised a simplified approach to instructional design we call the 4Ds:

- Discovery
- Design
- Development
- Delivery

## **The Discovery Phase: Opening Up to Possibility**

**Always start with your purpose first.**

What prerequisites and essential content must a learner have already experienced and learned? What behavior changes or proof of new knowledge is hoped for? How will you determine if a learner has reached his or her or the program's goals? What special considerations are involved in working with the learners that are anticipated for the course? What is there that the instructor or instructors can use in the way of space, equipment, books in the library, and so forth?

Answering these questions can be boiled down to these five steps:

Step 1: What is required by your curriculum?

Step 2: What learning outcomes are you looking for?

Step 3: What learning objectives will result in those outcomes?

Step 4: Who will your students be?

Step 5: What are the available resources?

### ***Step 1: What is required by your curriculum?***

- How does your course fit into the curriculum?
- What does your department already require from your course?
- Does your course fit into a degree program?
- What do courses coming after yours expect your students to know?

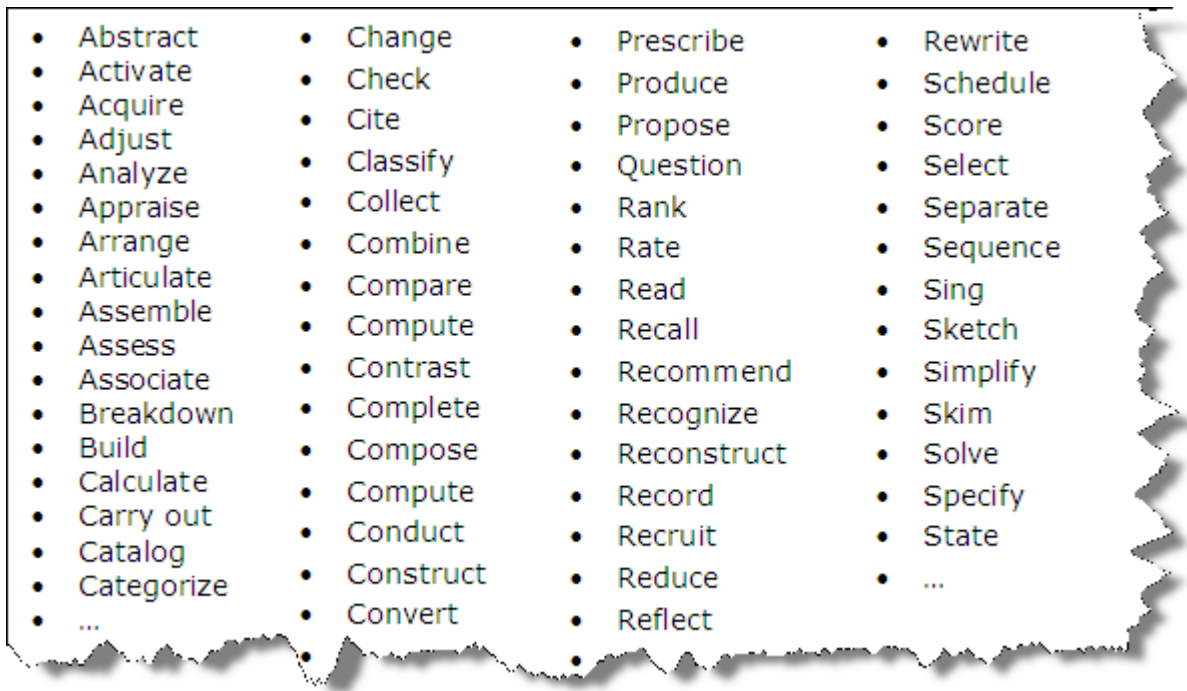
### ***Step 2: What learning outcomes are you looking for?***

- To learn a skill.
- To master a theory.
- To measure a change in behavior.
- To motivate the learner.
- To supplement an existing course.

### ***Step 3: What learning objectives will result in those outcomes?***

Learning objectives must always be written using action verbs. Here's a sample of some of the action verbs we use when writing learning objectives.

- A student completing your course will be able to...



***Step 4: Who will your students be?***

- What will your students need to know before taking your course?
- Prerequisites/Co requisites
- What accessibility issues are you required to meet?
- What level of technological readiness will students need to take your course?

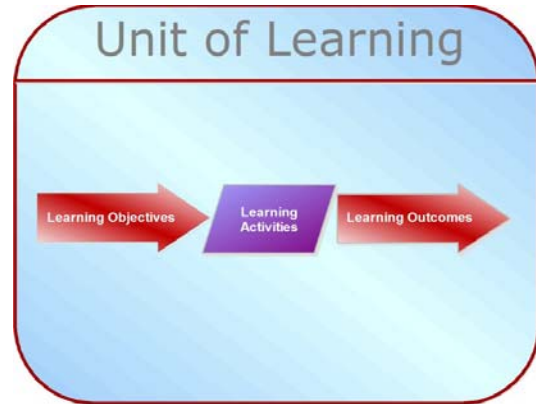
***Step 5: What are the available resources?***

- Content
- Technology Tools
- Instructional Support
- Technology Support
- Infrastructure
- Organization or community assets

## The Design Phase: Special Considerations for Virtual or Blended Courses

Mastery of the design process starts with understanding your “units of learning.” Each unit of learning is made up of three basic components:

1. Learning Objectives
2. Learning Activities
3. Learning Outcomes



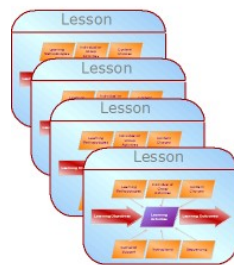
One possible name for a unit of learning is a “lesson.” Each lesson, therefore would be made up of the objectives, activities and hoped for outcomes that make a coherent chunk of learning.

Each learning activity can be further divided into at least these six parts:

1. Choice of content
2. Choice of technology
3. Choice of individual or group activities
4. Level instructor support
5. Instructions
6. Sequencing (where in the sequence of learning activities will this learning activity fit?)



A course is, therefore, made up of a collection of lessons, each of which is made up of specific learning objectives, activities and anticipated outcomes and the whole of which are delivered in a sequence across a period of time.



**Etc.**

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Up to this point, nothing we've described will be seen as new to experienced instructors or course designers. However, there are several special considerations that must be understood in the designing of courses for virtual or blended delivery:

- Facilitation
  - The process of being the “guide on the side” offering well placed comments and direction to learners throughout the course duration
- Technology
  - What do you have? What do the students have? What will be your limiting factors? Software versions? Bandwidth? Technology Readiness?
- Training
  - What special training will you or your TAs or your learners need to take advantage of your course design and the technology it requires?
- Phasing
  - It will be important to phase the technological enhancements of your course in gradually so that neither you nor your learners are overwhelmed by the technology distracting you from the content.
- Time Management
  - What new time management skills, if any, will you need to start practicing to make this all work?
- Resistance
  - Will you have to give special attention to learners who are resistant to using technology? What about detractors from within your department or the organization?
- Planning
  - What advanced planning must you do, for distribution of handouts, for example or for copyright permissions on readings you want to post online?
- Writing
  - The web is essentially a medium of writing. What level of writing skills will students need to be able to fully participate in your course? Will you need to do any remedial writing instruction? What will the basic course guidelines about style be? Will you use a style guide? Which one?

## The Development Phase: Building Your Online Course

In this phase we engage in the process of...

- ...outlining lessons,
- ...developing materials,
- ...producing media, and
- ...building the virtual learning access environment,
- ...into which we place the developed lessons.

The activity of outlining lessons is basically that of identifying the...

- ...instructions,
- ...readings and resources,
- ...lectures,
- ...and so forth,
- ...that we intend to include as content for our course.

Producing media is the process of creating and testing media elements, for example...

- Flip charts or overhead transparencies,
- Slideware presentations (e.g. PowerPoint)
- Compressed movies (e.g. Flash) created from slideware
- Computer screen captures
- Voice over narration of slideware presentations or movies created from them,
- Audio and video clips
- Web pages.
- Paper and electronic handouts,

Here are some examples of printed materials that are still part of many online courses (unfortunately, we still haven't invented the paperless office):

- Participant biographical form
  - To be completed and returned
  - Website with interactive form, if possible
- Welcome letter to participants
- Course content and structure
- Topical outlines with time on topic
- Workbook if appropriate
- Instructions for local activities
- Instructions to teaching assistants/site managers
- Support for local activities (on-screen images before or during a session)

What do you typically create as handouts?

## The Delivery Phase: Key to Online Success

Key to success of any online or blended course is to rapidly move from an emphasis on the technology and process to an emphasis on learning and content. This naturally occurs with time, but can be facilitated to speed up the process. As time passes learners begin to take on more and more of the co-facilitation necessary for online learning.

Carefully nurture the delivery of your online course through these five stages:

### 1. Access and Motivation

- Get in and gear up
  - **Learners** access the virtual learning environment
  - **Instructor** welcomes and encourages

### 2. Socialization

- Socialize and get comfortable
  - **Learners** send and receive messages
  - **Instructor** familiarizes and builds bridges

### 3. Interaction

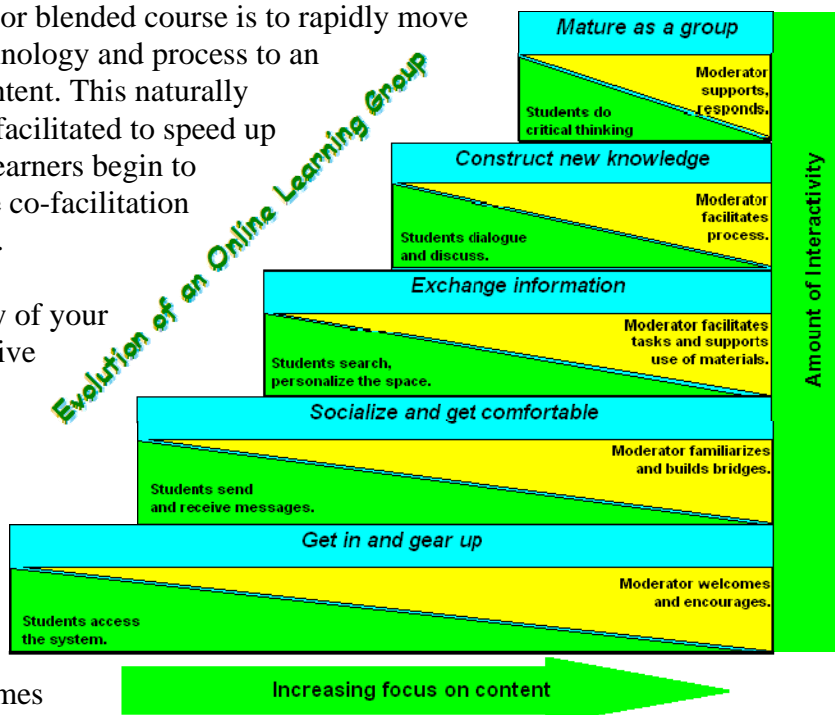
- Exchange information
  - **Learners** search the space and personalize it
  - **Instructor** facilitates tasks and supports use of materials

### 4. Knowledge Construction

- Construct new knowledge
  - **Learners** engage in dialogues and discussions
  - **Instructor** facilitates process

### Critical Thinking and Responsibility for Learning

- Learning group matures both as learners and as a group
  - **Learners** practice group learning and critical thinking
  - **Instructor** supports these activities and facilitated a deepening of both learning skills and interaction skills as well as knowledge of content



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## References

[1] Knowles, Malcolm. *The Modern Practice of Adult Education: Andragogy versus Pedagogy*. New York: Association Press, 1970

[2] Hiltz, S.R. and Turoff, M. *The Network Nation: Human Communication via Computer*, Addison-Wesley, 1978. Revised edition published by MIT press, 1993.

[3] Based in part on the following:

Cross, K. Patricia. *Adults as Learners: Increasing Participation and Facilitating Learning* (San Francisco: Jossey-Bass, 1981).

Knowles, Malcolm S. *The Modern Practice of Adult Education: Andragogy Versus Pedagogy* (New York: Association Press, 1970).

[4] McGregor, Douglas. *The Human Side of Enterprise* (New York: McGraw-Hill, 1960).

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