

Developing an Effective Online Course

Faculty Manual for the Web Based Course

**by Valerie Landau
Round World Media**



Acknowledgments

This book is designed to accompany the online course “Developing an Effective Online Course” <http://www.roundworldmedia.com/cvc>

Credits

The online course was developed for the Bay Area California Virtual Campus Center, under the direction and vision of Martha Mills. The course was written and developed by Valerie Landau with collaboration and input from a team of outstanding educational technologists:

Francine Van Meter, Cabrillo College
Scott Hildreth, Ph.D., Chabot College
Scott Vigallon, Las Positas College
Marilena Tamburello, Ohlone College

Development Team

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The “Developing an Effective Online Course” Web site will be kept current and contains hundreds of links that support the print version.

This is an work in progress and any comments on how to improve the book and the online course are welcome. Send email to vlandau@roundworldmedia.com.

All the URLs (Web links) were current at the time of printing but may change in time. Please report any out of date links to vlandau@roundworldmedia.com.

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Developing an Effective Online Course: An Overview

Some people call it distance learning but it is actually the collapse of distance.

*President Bill Clinton, October 1, 2001
Online Learning Conference, Los Angeles*

This book is a compliment to the online course “Developing an Effective Online Course”. The goal of the course and book is to guide you through the process of developing an online course proposal and to complete one module of instruction.

Throughout the book there are references to the “Developing an Effective Online Course” Web site where there are links to additional resources and examples for each chapter.

<http://www.roundworldmedia.com/cvc>

The Curriculum Wizard

The core of the course lies in the *Curriculum Wizard*. The Curriculum Wizard is a convenient online tool that will help you get your course proposal online quickly and easily. Simply type or paste your completed assignment into Curriculum Wizard, submit it and it instantly become a Web page. You can easily make changes and edit your work any time. If you complete all the assignments you will have posted an online course proposal that includes one sample module.

To make an unpopular but easy-to-understand analogy,

This Book is to the Curriculum Wizard what the
IRS Instruction Booklet is to the Form 1040

The relationship between this book and the Curriculum Wizard has a similar relationship to that of the IRS Instruction Booklet to form 1040. The big difference is that this course is a lot of fun and designed to advance your professional development.

Target Audience

This course is designed for people who are teachers or experts in their field and want to develop online courses.

Book Goals

By the end of the course you will have written and published the following:

- a course title and description
- reviews of other online courses
- course goals and objectives
- a description of the course target audience and necessary prerequisite skills
- a course outline
- one complete module of instruction including student assignments, assessment criteria, and Instructor's Notes
- a summary of the formative evaluation
- a management plan for completing the course

1: Course Introduction

The Internet is more than a text-based online lecture hall—it's become the communication medium for interacting with the students: conducting class discussions, posting assignments, sharing ideas, supporting each other, and collaborating as a group to achieve the learning goals.

Goal

Become familiar with both this books and the accompanying Web site and Curriculum Wizard.

Objectives

Students will:

- review the accompanying Web site
- experiment with the Curriculum Wizard

Warm-up Questions

"Some people call it distance learning but it is actually the collapse of distance."

President Bill Clinton, October 1, 2001

Online Learning Conference, Los Angeles

Do you agree with this statement? In what ways does online learning collapse distance?

Topic 1: Course Introduction

Instructor's Notes

We, who embark on the task of teaching online at the dawn of the 21st century, are the pioneers defining and charting the field of online education. You, as online educators, will help evolve and define the online learning community through the courses you develop.

While the traditional teacher's workplace was defined by the chalkboard, chairs, and classrooms, the online instructor has a new set of tools: discussion boards, chat rooms, Web pages, file sharing, interactive multimedia and video and audio. The new tools reach across continents making learning accessible to new audiences. However, as you've already experienced, the new technology is more difficult to master, doesn't always work well, and sometimes crashes.

The tools of the trade have changed, but the fundamental role of the teacher remains the same. The teacher's role is still to facilitate the students learning process, to create a context for transforming data into knowledge and to create community, motivation, and support.

The online medium offers a new set of tools and new ways of communicating. It is highly unlikely that you can simply transfer what you are doing in the classroom onto the Web. Trying to 'port' a classroom experience to the Web is analogous to putting a radio show on TV. It just doesn't translate well because it's not making full use of the capabilities of the medium.

In the online experience, some of the most common teaching and learning methods used in the classroom are fundamentally transformed, including:

- attendance
- face-to-face (f2f) contact
- lecture
- class discussions
- question and answer
- note taking
- demonstration
- labs
- creating rapport and motivating students
- setting a scheduled time to meet
- social interaction
- a sense of "peer pressure" in the class
- communication via the spoken word

The Internet facilitates:

1. Research
2. Communication and collaboration tools, including:

Common Tools

- text-based discussion boards
- email
- file sharing
- chat rooms
- listserv
- Web sites
- Interactive multimedia

Not Yet Fully Accessible

- teleconference
- online collaborative white boards
- streaming video and audio
- application sharing

The computer facilitates:

- self-paced tutorials
- self-correcting tests and quizzes
- tracking student progress
- generating automatic responses
- interactive multimedia learning objects, such as simulations, tutorials and presentations

The online communication tools facilitate multiple levels of synchronous and asynchronous communication, including:

- peer to peer
- one to many
- many to many
- many to one
- small group
- large group

Benefits and Drawbacks of Teaching Online

One thing is clear from the research on the effectiveness of online course: if a course is well designed, the instructor is a good facilitator, and the students are motivated, online courses can be a meaningful and fulfilling learning and teaching experience.

Advantages of teaching online:

- It cuts down on commuting. Teachers and students can do coursework at home and/or while traveling.
- There is a written record of what occurred in the course.
- Students can engage in peer dialog online. Students and instructors can ask and answer questions any time of day or night.
- The Web provides an environment with infinite resources.
- The course is accessible to a broader pool of students.

Disadvantages of teaching online:

- Developing and teaching an online course is far more work than developing and teaching a face-to-face class
- Lack of face-to-face interaction
- Unexpected technical difficulties
- A higher dropout rate exists among students

The Production Process

The production process for online courses is based on two models:

- principals of instructional design
- Web and multimedia production

The production of online media (Web sites and multimedia) is usually broken up into four stages

- Concept Definition Phase
- Design Phase
- Production Phase
- Testing and Quality Assurance Phase

According to Dr. George Bracket, from the Harvard Graduate School of Education, “The development process is designed to divide problems into manageable chunks that generate maximum creativity and planning in the early stages and maximize productivity during the production phase. By spending more time planning and testing in the early stages you can avoid expensive mistakes later on.”

1. Concept Phase

In the concept phase the course topic and approach are researched and a concept document is created. The concept document clearly defines the intent and scope of the project. The concept document should include:

- research
Before developing a course two types of research should be conducted: an academic literature review (what else is out there and how can we improve or expand on existing courses rather than replicate them?), and a market study (is there a demand/need for this?)
- course goals and objectives
- definition of target audience
- course description
- an outline of the course content
- an asset list with the resources needed (what text, graphics, or multimedia elements, programming, database or Web hosting will you need?)
- a flow chart (how will the pages link together?)
- a budget (how much will it cost?)
- a milestone calendar (how long will each task take?)

2. Design and Prototype

In the design phase the course content, navigational structure, assets, approach and graphic design are developed in detail. Sample graphics and layouts are established and technical requirements are specified. The following elements are developed in the design phase:

- a detailed storyboard with a list of what content (text, graphics, multimedia, programming, etc.) will be on each page
- a prototype
The prototype is a first draft of the site and includes the site navigation, the look of the site and a sample of what the rest of the site will be like
- a course management plan
- formative evaluation (user testing) is conducted

- programming and other technical requirements (integration with a database, course management systems, etc.) are specified and tested if necessary

3. Production Phase

The content and technical issues are developed, integrated and finalized:

- writing is completed
- Web pages are created and uploaded
- graphics, multimedia elements and programming are completed
- formative evaluation (user testing) is conducted

4. Testing and Quality Assurance Phase

The site is uploaded and checked:

- spelling errors, grammar, and quality of content are tested
- technical issues including speed, browser compatibility, broken links, appearance of graphics and multimedia elements and effectiveness of the programming are tested

Topic 1: Course Introduction Assignment

Step 1. Review the Curriculum Wizard on the “Developing an Effective Online Course” Web site. <http://www.roundworldmedia.com/cgi-bin/cgiwrap/project2/wizard.cgi>

Step 2. Enter your name, email address, the working title, and description of the course you are going to develop.

Topic 2: Evaluation Criteria and Critique of Existing Online Courses

*The measuring stick you use will later be used to measure you.
—Latin American proverb*

Goal

Review and define evaluation criteria for developing online courses.

Objectives

Students will:

- review evaluation criteria
- critique existing courses based on the evaluation criteria

Warm-up Questions

What criteria do you use to evaluate courses? Is this criteria relevant for evaluating online courses?

Topic 2: Evaluation Criteria and Critique of Existing Courses

Instructor's Notes

“We must adjust to changing times and still hold to unchanging principles.”

—President Jimmy Carter, January 17 1977
quoting his teacher, Julia Coleman.

How Do You Evaluate an Online Course?

If you want to be successful at something, first ask, “How is this going to be evaluated?”

There are many ways to evaluate courses. Most major academic institutions in the United States have developed evaluation criteria for online courses based on “The Seven Principles of Good Practice in Undergraduate Education,” by Arthur W. Chickering and Zelda F. Gamson.

<http://www.hcc.hawaii.edu/intranet/committees/FacDevCom/guidek/teachtip/7princip.html>

The seven principals defined by Chickering and Gamson are:

1. *encourages contact between students and faculty*
2. *develops reciprocity and cooperation among students*
3. *encourages active learning*
4. *gives prompt feedback*
5. *emphasizes time on task*
6. *communicates high expectations and*
7. *respects diverse talents and ways of learning*

While these seven principals are the backbone of how many online courses are evaluated, there are some additional factors to consider.

The Paul Allen Foundation Virtual Education Contest developed criteria for judging online courses. The goal was to select the best course based on four principle criteria:

- (A) creative use of technology
- (B) sound instructional design
- (C) integration of active learning
- (D) evidence of educational effectiveness

In “Making Instruction Work,” Robert F. Mager summarizes how he evaluates courses: “A course is effective to the degree that it accomplishes what it sets out to do. It is efficient to the degree it accomplishes its purpose with the least motion (time, effort, money).”

The following list of questions was developed to help evaluate online courses.

Key Questions for Online Courses

Keeping the Students Interested

- Does the course communicate what is exciting about the topic?
- Does this course communicate that there is something of real value to the student? Is the inherent motivation clear? Will the student say, *“Learning this is of direct benefit/interest to me?”*
- Does the course include external motivators and/or do I need them? Will the student say, *“If I do ‘X’ I will get 100 points, my social status will increase, I receive extra privileges or notoriety.”*
Humor, clear writing, and good graphic design can also be external motivators. Humor must be used cautiously, however. As Peachpit Press’ Senior Academic Marketing Specialist Jim’Bo Norrena says, *“I’ve always believed ‘Online Stand-up Comedy’ to be about the worst idea ever presented to mankind!”*
- Can the course be more interactive?
- Does the course make use of collaborative assignments to create a greater sense of community and help the students feel supported and engaged?
- Does the course set uniform objectives but still honor the individual approaches of the students?
- Does the course accommodate different learning styles: hear, see, and do?
- Is this course culturally sensitive? Is the information presented in a way that respects diverse opinions and beliefs?

Obstacles to Learning

- Is the subject material presented in such a way that students might perceive it as “too hard” and beyond their capability?
- Does the class erode self-confidence?
- Are the course prerequisites clear?
- Is the graphic layout interfering with the content?
- Are the pages accessible to people with disabilities? (*See Topic 8: Web Design and Accessibility*)

Feedback

- Is the feedback the student receives immediate, clear, and constructive?
- Does the feedback the student receives promote the student’s learning?
- Does the feedback help students to complete the assignments?
- Are their clear guidelines regarding the type of feedback students can expect?

Media Selection

- What type of Internet connections will the students have?
- Will they be able to see and hear multimedia elements? (Flash animations, video, and audio)
- Will rich media (sound, graphics, video) enhance this course? How?
- How will rich media (sound, graphics, video) detract from the course?
- Will rich media be too cumbersome for the user to download? Is it too expensive/difficult to develop?

Leveraging Technology

- Does the course take advantage of communication tools, such as email, listservs, chat rooms and bulletin boards, Web pages, graphics, streaming media (video/audio), and interactive multimedia tutorials, so the students will achieve the learning objectives?
- Is there something the Internet can add that can't be done in other mediums?
- Does the course utilize the Internet to create a context for learning?
- The Internet is a huge resource for data, but does this course help students transform data into knowledge?
- What is the most difficult aspect of teaching this course online? What could make that easier?

Review Existing Online Courses

It is helpful to review existing online courses and critique them before developing your own. In the academic community this is called a *literature review* and in the business world it is called a *market survey*.

The reason we survey the field before beginning is:

- to learn from others
- to improve on what others have done, rather than duplicate what they have done
- to immerse oneself in the world of online education

Topic 2: Evaluation Criteria Assignment

Step 1. Evaluate an existing online course.

To find a course to review either conduct an Internet search or select a course from the Online Course List on the “Developing an Effective Online Course” Web site.

Things to think about while you are reviewing other online courses:

- Is there something you like or do not like about the course in terms of the course content, the layout, the assignments, the links, the writing style, or the graphics?
- By looking at the courses, is there a lesson for you on what not to do?
Make sure to include <http://> in the URL.
If possible, identify authors, institutions, and date of posting or other details about the citation.

Step 2. Enter your report (less than 1000 words) into the evaluation section of the Curriculum Wizard.

Your evaluation will become part of a repository of online course evaluations.

Topic 3: Surveying Online Courses

“The art of teaching is the art of assisting discovery.”

—Mark Van Doren, poet

Goal

Survey online courses and identify teacher-centered and student-centered approaches.

Objectives

Students will:

- Review existing online courses related to their topic
- Use “Bloom’s Taxonomy of the Cognitive Domain” to identify levels of cognition in one teacher-centered and one student-centered online assignment
- Analyze the advantages and drawbacks of each method

Warm-up Activity

The terms “guide on the side” and “sage on the stage” describe two distinct educational models.

The “guide on the side” describes the student-centered approach where the teacher’s role is like a coach who facilitates the students’ learning. The coach may transfer knowledge to players regarding techniques and strategies, but the players are expected to develop those skills through practice and experience. The same is true for the student-centered courses.

The “sage on the stage” refers to the traditional teacher-centered approach. In a teacher-centered course, the teacher’s expertise is the center of the course. The student’s role is to assimilate the knowledge by listening, watching, reading and study.

Evaluation in a teacher-centered course is centered on the student’s ability to remember key concepts often via multiple choice, true/false quizzes and tests.

Reflect on your experience as a student and remember two outstanding teachers: One “guide on the side” and one “sage on the stage.”

Topic 3: Surveying Online Courses

Instructor's Notes

Constructivism and the Student-Centered Approach

“When you make the finding yourself—even if you’re the last person on Earth to see the light—you’ll never forget it.”

—Carl Sagan

In surveying courses it can be helpful to look critically at both student-centered and teacher-centered courses to see which technique might be worth adapting and which may not work for your course.

Student-centered courses focus on the learner rather than the teacher. Student-centered teaching is based on the constructivist model in which students construct knowledge rather than receive it.

In “The Virtual Classroom: Learning Without Limits Via Computer Networks,” Roxanne Star Hiltz describes the student-centered constructivist model of teaching:

Constructivist learning models require active input from students and requires intellectual effort and aids retention. The role of the teacher in student-centered learning is to facilitate the students’ learning by providing a framework (i.e., activities for students to complete) that facilitates their learning. For example, the teacher posts activities or questions that students complete. Projects include: Writing papers, essays, and reports, publishing Web pages, conducting research, answering open-ended questions, creating artwork, and organizing events.

Constructivists believe that for higher levels of cognition to occur, students must build their own knowledge through activities that engage them in active learning. Effective learning happens when students take stock of what they already know and then move beyond it.

Key Concepts in Constructivism

Constructivism is based on the following key concepts:

- People create mental schemas or scaffolding on which to store and recall the information.
- The broader a student’s schema the more that student is able to learn.
- If a person has multiple types of exposure to a subject they create a broader mental schema about the subject, allowing them to assimilate and store new information easily.

In most cases, if students have actually constructed their own framework or schema by experimenting, they are more likely to retain the facts learned about it.

Example: Eleven Facts About a Banana

Category = fruit

Type of fruit = tropical

Maturation identifiers:

Skin = thick and peeled from top down when ripe

Color

Green = not ripe

Yellow = ripe

Black = over ripe

Taste

Not ripe = starchy and bitter

Ripe = sweet

Over ripe = sweet and fermented

Texture

Not ripe = hard and starchy

Ripe = slightly firm, easy to slice, break, or mash

If we had never seen or tasted a banana we may have a hard time understanding, remembering, or caring about these banana facts. After one bite of ripe, unripe, or overripe bananas, the student will recall these eleven facts and more, probably for a lifetime.

So, once we have constructed our own knowledge about something, we create a schema or scaffolding on which to place the new information. By tasting the banana we are able to assimilate more information about it. For example, once you have tasted the banana you can understand and remember more information about it, via teacher-centered techniques like lectures, text, videos, graphics, *etc.* By tasting the banana and experiencing it first hand you create a schema that helps you store and recall a large amount of new data relating to the banana. Cognitive psychologists believe that the more solid and diverse schemas a person has, the easier it is to process and assimilate new ideas, concepts, and facts.

Constructivist Methodology

A constructivist teacher will begin a lesson by asking students to recall what they already know about the subject. Then they will involve students in an activity that will take them beyond what they currently know. The student must actively engage in the learning process by doing something.

Constructivist activities include:

- Constructing
- Experimenting
- Practicing
- Summarizing
- reading
- conducting research and analysis
- articulating (writing, drawing)

In order to carry out these learning projects, students often need preparation and guidance. This preparation and guidance in the online environment can be:

- Instructor's Notes (text-based Web pages, listservs, emails, chat sessions, interactive multimedia, or audio or video lectures)
- other media (books, videos)
- collaboration with other students

A Constructivist Speaks on the Transition from Classroom to Online

Constructivists believe that student-centered techniques are more effective both in the traditional settings and online.

The Myth of the Talking-Head

Boise State University technical communications instructor Mike Markel challenges the idea that teaching a distance learning course requires a whole new pedagogy that substitutes an independent-learning, student-centered, empowering model for the old talking-head, teacher-centered, passive-student model. Markel says the notion that instructors in traditional classes spend most of their time lecturing is a myth; what they really do is help students organize information, help them with their projects, give students a chance to meet with their teams, and motivate the students. And that's exactly what needs to be done in a distance-learning environment as well. Everyone will lose if traditional and technology-supported forms of education are pitted against each other because conscientious instructors need to do the same thing, whether they offer distance education or classroom-based education. The goal should be to think continuously of what we are trying to accomplish in the teaching/learning process, and to orchestrate the particular techniques and resources in the best and most effective way to accomplish the complete set of specific educational objectives.

—Eduprise Web site 07-02-1999 eduprise/NEED-TO-KNOW
summary of "Distance Learning And The Myth Of The New Pedagogy,"
Journal Of Business And Technical Communication," v13 n2 99.

Project-based, student-centered, collaborative courses require a lot of thought, energy, and creativity to build and facilitate both online and face-to-face (f2f). They also require that the teacher relinquish the center stage.

Teacher-Centered Techniques

The preliminary research shows that courses that are entirely teacher-centered can be effective in the face-to-face environment but when converted to the online space they have an extremely high drop out and failure rate. Many of the built-in motivators that exist in the traditional classroom (peer pressure, respect for the teacher, required attendance, courtesy, and conformity) are transformed in the online space. By being stripped of the traditional schedule, setting and social requirement to sit and listen, the teacher-centered online course often becomes analogous to the unused gym membership or workout video.

Students put off the tiresome task of reading or listening to an online lecture and say to themselves, “I’ll do it tomorrow.” But as we all know, tomorrow never comes. For all but the most motivated students, the online teacher-centered course becomes a lesson in procrastination. The research shows that the student-centered courses are more effective online because the students feel supported and engaged by their classmates and think of the teacher like a personal trainer who cares about their progress and monitors their achievements. In student-centered courses a sense of community can be created.

While the current studies in distance education support student-centered teaching methods, in the 1980s–90s, countless studies were conducted proving the effectiveness of Computer-Based Training (CBT) that for the most part followed the teacher-centered model but replaced the teacher with text and multimedia presentations. (*See Topic 3 Resources on the “Developing an Effective Online Course” Web site for citations of studies.*) So, we can see that if the motivation exists, teacher-centered techniques can, in-fact, be powerful and effective.

Some of the enthusiasm for online learning is based on the fact that the computer automates many of the mundane teaching tasks associated with teacher-centered techniques such as grading multiple-choice or true/false tests and disseminating factual information.

The Best of Both Worlds

All educators (teacher-centered and student-centered) agree that motivation is one of the most important components in learning.

Many effective online courses involve some combination of both; teacher-centered techniques involving the transfer of knowledge (lecture, texts, video) and student-centered techniques (write, discuss, draw, conduct experiments, conduct research, analyze, plan, collaborate, *etc.*).

Your job as a course designer is to find which techniques will most effectively the achievement of the course goals and objectives.

Topic 3: Surveying Online Courses Assignment

Step 1. Review existing online courses.

Conduct a search for online courses related to the topic of the course you're developing, or select courses from the **Online Course List** on the "Developing an Effective Online Course" Web site. Review 4–10 courses or as many as necessary to find examples of both a student-centered and a teacher-centered course.

Make sure to bookmark all the sites for your report.

List at least four URLs of courses related to your topic. If possible, identify authors or institutions and date of posting or other details about the citation.

Step 2. Select one teacher-centered course. Use Bloom's Taxonomy to identify levels of cognition involved in one assignment.

Step 3. Select one student-centered course. Again, use Bloom's Taxonomy to identify levels of cognition involved in one assignment.

Step 4. Write a brief review analyzing the drawbacks and benefits of each approach based on your findings in steps 2–3.

Post your report (less than 1000 words) on the Curriculum Wizard.

Topic 4: Developing Goals and Objectives

“If you don’t know where you are going, how do you know when you’ve arrived?”

Goal

Develop goals and objectives for your course and for one unit of instruction and rate them according to “Bloom’s Taxonomy of the Cognitive Domain.”

Objectives

Students will:

- identify an overall goal for the course being developed
- create measurable objectives for the course
- determine a broad goal for one module of instruction
- write measurable objectives for the module of instruction and categorize them according to Bloom’s Taxonomy

Warm-up Quiz

Identify which of the following sentences are best suited to be course goals and which are best suited as course objectives?

Definitions:

Course *goals* are broad statements indicating what the student will learn.

Course *objectives* are easily measurable and often include specific skills that the student can demonstrate.

1. Students will learn conversational Spanish.
2. Students will write four sentences in Spanish.
3. Students will use fifty vocabulary words in a conversation with another student.
4. Students will learn Spanish grammar.

Topic 4: Developing Goals and Objectives

Instructor's Notes

“My goal is simple. It is complete understanding of the universe.”

—Stephen Hawking

Developing Goals

The course goals are broad statements of what the students will be able to do when they have completed the course. Goals can be lofty ideas, using words or phrases like “appreciates” or “shows leadership ability.”

Example of a broad course goal:

Students will gain a greater appreciation for Latin music.

How can we measure if a person appreciates music? It would be very difficult. That is why we develop objectives. The objectives are measurable and specific so you can determine if the goal was achieved.

Developing Measurable Objectives

“The goal is where we want to be. The objectives are the steps needed to get there.”

Measurable objectives are the specific measures we use to determine whether or not we are successful in achieving the goal. The objectives are instructions about what we want the student to be able to do. Use verbs and include specific conditions (how well or how many) that describe to what degree the students will be able to demonstrate mastery of the task.

Some educators call these learning outcomes; others call them measurable objectives; and yet others call them behavioral objectives because they describe observable behavior rather than knowledge.

Here are some examples of measurable course objectives

Students will:

- listen to at least twenty different Latin American recording artists
- attend three live concerts featuring Latin American music
- identify five different Latin American rhythms from the recordings posted on the course Web site
- create a play list featuring ten recordings representing different Latin American genres

It is easy to measure each of the objectives—either the student has or has not accomplished the objectives.

Creating Measurable Objectives as Assessment Tools

Measurable objectives are used as assessment tools. Once the objective is defined, it becomes the foundation for your grading or assessment policy. If your grading policy differs widely from your behavioral objectives, you should reconsider one or the other.

In developing your objectives be sure to include:

- conditions (how or where the student will perform the task)
- behavioral verb (describe student behavior)
- criteria (how well the student performs the behavior)

Guidelines for Writing Measurable Objectives Rubric

The hardliners in the field of writing behavioral objectives state that the behavioral objectives must be written according to the following template:

The learner's demonstrated skill	Conditions under which the learner demonstrates the skill	Criteria for measuring success
The student will be able to identify measurable objectives	From a list which includes 20 broad goals and 20 measurable objectives	The student will complete the task with no errors

By clarifying expectations—how many, to what degree, under what conditions, *etc.*, both the teacher and students are clear about what is expected. However, in practice, only a few people actually include the criteria for measuring success in the objectives because often it is implicit in the skill itself.

For example:

Students will memorize and recite a poem.

Sometimes the goal is the same as the objectives. For example, in “Topic 5: Writing the Course Outline” both the goal and the objectives are the same: Write the course outline.

Learn the rules, then use your judgment.

Behavioral Objectives Checklist

You can use the following points as a checklist for writing behavioral objectives.

- Does each of the objectives describe what the students will have done upon completion of the course?
- Categorize the verbs in the objectives according to Bloom’s Taxonomy. Does at least one objective fall into categories three through six?
Application (3) Analysis (4) Synthesis (5) Evaluation (6)
- Do your objectives describe “to what degree” or “how much” or “how well” a student must demonstrate the skill or knowledge?

- What is the most exciting part of the skill you are teaching? Can you incorporate or emphasize that element more in your goals and objectives?
- If you have more than fifteen objectives you probably need to cut back on the content of your course.
- Compare your goals and objectives with those of courses similar to yours. What can be improved in the other course's goals and objectives? Do your goals and objectives need revision?

Rubric: Guidelines for Evaluating Behavioral Objectives

The rubric below is an example of how to create clear guidelines for evaluating and grading behavioral objectives.

What Counts?	Competent Work	Common Mistake	Needs to be Revised	Missed the Point
Objectives are measurable	Objectives are measurable and include specific information about what the student will be able to do, e.g., how well, how many, to what degree	Objectives are too general and don't include specific information on what the student will be able to do, e.g., how well, how many, to what degree	Objectives are not measurable Objectives don't describe what the student will be able to do	Objectives are not universally measurable and do not include what the student will be able to do
Objectives require high levels of cognition	Objectives reflect high levels of cognition according to Bloom's Taxonomy	All the objectives require low levels of cognition such as "demonstrates understanding," or "identifies"	Objectives should include at least one of the verbs in the levels 3-6 of Bloom's Taxonomy	All the objectives are in level 1 of Bloom's Taxonomy
The learning objectives should be achievable	The objectives listed are realistic given the time and level of the target audience	There are too many objectives	Objectives are too difficult	Objectives don't use verbs to describe what the student will be able to do
Are the goals of interest to the learner?	The learning objectives are of interest to the learner	The learning objectives don't make the intrinsic and external motivation clear to the learner	The learner can't understand the learning objectives	The learner doesn't want to complete the tasks in the learning objectives

Applying vs. Knowing

“Learning is most often figuring out how to use what you already know in order to go beyond what you currently think.”

—Jerome Bruner, father of Cognitive Psychology

During a 1996 talk at the Harvard Graduate School of Education, educator and software developer Tom Snyder talked about the role of computers in education:

“One thing a computer will never do is teach. Kids pushing buttons doesn’t constitute learning. Social interaction makes good learning. Learning is most often figuring out how to use what you already know in order to go beyond what you currently think...”

“... Learning is something that happens between two people. Technology lets people interact with each other; like a book lets us meet a person from another time and place. The transaction takes place between what the writer puts in it and what the reader gets out of it... To know is not enough—you must be able to apply knowledge and demonstrate it in context.”

“... Knowing how something is put together is worth a thousand facts about it. It permits you to go beyond it...”

Anecdotal examples that demonstrate students can understand the lesson but are unable to apply the knowledge

Second-grade Math

Felipe Pasmanic, a second-grade teacher at Buena Vista Elementary School in San Francisco, discovered that students could understand a concept or procedure but not know when to apply it. He was teaching the concept of addition using “regrouping” (adding in columns). After his presentation he asked groups of students to solve the problem $13+18$.

Some groups used regrouping to solve the problem.

$$\begin{array}{r} 13 \\ +15 \\ \hline 28 \end{array}$$

Others made 13 marks and then 18 marks and counted the total number of marks.

$$\begin{array}{r} 111111111111 \\ 111111111111 = 28 \end{array}$$

Felipe thought these students did not understand the lesson on regrouping.

To find out what they didn’t understand Felipe asked those who used the marking method to demonstrate regrouping using the numbers 13 and 15. Much to his surprise, they all were able to add the numbers using the regrouping method. He realized that all the children had learned regrouping but only a few were able to figure out when to apply the method. In other words, they were able to retrieve the information when given specific instructions but were unable to use it to solve a problem.

Teaching Microsoft Works

A similar situation occurred when teaching a textbook-based computer course at Ohlone College in Fremont California. The course consisted of students completing a step-by-step tutorial in Microsoft Works. After completing the database section, the instructor modified the exam in the book and asked students to solve the following problem.

Students were asked to develop a database for a media distribution company selling books, cassettes, and CDs. They were asked to enter formulae to calculate the cost of each customer's purchase, including sales tax.

$$\begin{array}{rcl} \text{Books} & = & \$15 \text{ times \#ordered} \\ & & + \\ \text{Cassettes} & = & \$10 \text{ times \#ordered} \\ & & + \\ \text{CDs} & = & \$20 \text{ times \#ordered} \\ & & + \\ \text{Sales tax} & = & 8\% \end{array}$$

None of the students was able to complete the assignment.

The instructor said, "Okay, let's try to figure this out on the white board. Who can tell me how to calculate the following: If I buy one \$20 CD and one \$10 book, what will it cost me, including sales tax?"

All the students were able to figure out the problem on the board, but they were not able to apply their knowledge to this new medium—the database.

Then the instructor asked, "How do you create three fields and enter these calculations?" They were all able to complete the task because the teaching method emphasized learning the procedure for creating formulae in fields, rather than knowing how to use the database. They had learned the material, but were simply not able to apply it.

Vocational and Academic

Vocational training is focused on performance improvement. The learning objectives are clearly defined and easily measured by pre- and post-tests. Vocational training focuses on specific measurable skill-building tasks: Can the worker set the machine dial to X?

Example of vocational goals and objectives:

Goal—Employee will be able to operate the system.

Measurable Objectives—Employees will be able to:

- set monitor levels
- adjust dials
- read and interpret print-outs
- input five standard commands
- report warning signs

The academic approach attempts to assist students in constructing knowledge or schemas that the learner can use as scaffolding for adding future new knowledge. Educators try to develop structures upon which more knowledge can be assimilated and applied (*i.e.*, does the student understand the concept of setting a dial? Can the user set the dial to any factor of X?)

Learning Outcomes

If the desired outcome is for students to identify X, then a teacher-centered course may be the most efficient mode.

If the objective of the module is that the student research X, analyze X, apply X to four distinct scenarios and evaluate the outcome, a student-centered approach may be better suited.

Industry Trends Shift to Combine Academic and Vocational Training

Corporate executives and educational leaders are calling for a paradigm shift requiring a combination of academic and vocational training. As job skills change, so too must training strategies.

In the League for Innovation in Community College Conference in Miami, November 1998, the Chairman of Cisco Systems John Morgridge gave a keynote address stressing the importance of providing student-centered, “just-in-time” learning for workers. He stated: “Students need to know how to apply the skills and knowledge in creative and dynamic ways. We need employees who can take a concept and apply it to new and dynamic situations.”

Vocational and Academic Assignments

Online trainers and educators are frequently caught trying to balance teaching people a vocational skill (how to use Adobe Photoshop) and how to adapt and apply that skill to a dynamic situation (apply principles of image manipulation learned with Photoshop to other graphics programs).

Defining which learning objectives are vocational and which are academic can be helpful in designing assignments. If the desired skill is to identify a correct answer from a list, then a multiple-choice quiz is an excellent learning tool. However, if the skill is to write a sonnet, then ultimately the students will have to write the sonnet to demonstrate they have learned to apply the skill.

Benjamin Bloom's 6 Major Categories in the Cognitive Domain

1. Knowledge

Recognizes and recalls facts and specifics.

Word's that reflect knowledge:

define	record	name	relate	recall	state
memorize	list	repeat			

2. Comprehension

Interprets, translates, summarize or paraphrases information.

Words that reflect comprehension:

restate	tell	locate	explain	express	report
discuss	review	identity	recognize	describe	

3. Application

Uses information in a situation different from original learning context.

Words that reflect application of knowledge:

translate	employ	dramatize	schedule	apply	operate
interpret	demonstrate	practice	sketch	illustrate	use

4. Analysis

Separates the whole into parts until relationship among elements is clear.

Words that reflect analysis:

classify	differentiate	experiment	debate	examine	diagram
distinguish	appraise	test	interpret	translate	inventory
analyze	calculate	compare	inspect	relate	question
contrast	criticize				

5. Synthesis

Combines elements to form a new entity from original ones.

Words that reflect synthesis:

synthesize	compose	plan	arrange	manage	create
propose	design	formulate	summarize	organize	design
assemble	collect	predict	prepare	set up	construct
integrate					

6. Evaluation

Involves acts of decision making, judging or selecting based on criteria and rational.

Words that reflect evaluation:

judge	appraise	evaluate	choose	assess
rate	compare	score	select	estimate
revise	value	measure		

Topic 4: Writing Goals and Objectives Assignment

- Step 1.** Write your course goals. Enter your goals in the Goals section of the Curriculum Wizard.
- Step 2.** Write a draft of your course objectives.
- Step 3.** Compare your goals to the Behavioral Objectives Rubric and Behavioral Objectives Checklist.
- Step 4.** Categorize each learning objective according to Bloom's Taxonomy of the Cognitive Domain. (*See "Developing an Effective an Online Course" Web site for examples*)
- Step 5.** Revise your course objectives and enter them in the Objectives section of the Curriculum Wizard.

Topic 5: Writing the Course Outline

“Nature has no outline.”

—William Blake

Goal

Write a course outline.

Warm-up Activity

Compare the course objectives of this course to the course outline (*below*). What are the similarities between them?

Course Outline	Course Objectives
Topic 1: Introduction	Review the course materials Get acquainted with procedures Participate in class introductions
Topic 2: Evaluation Criteria	Evaluate an existing course
Topic 3: Survey of Online Courses	Review existing teacher-centered and student-centered courses
Topic 4: Developing Goals and Objectives	Define course goals and objectives
Topic 5: Writing the Course Outline	Write a course outline
Topic 6: Developing Assignment	Develop an activity for one module Develop feedback for the activity
Topic 7: Developing the Course Content	Develop Instructor’s Notes for one module
Topic 8: Web Design and Accessibility	Identify key issues regarding Web design and the Americans with Disabilities Act
Topic 9: Course Management and Planning	Review issues of course management and facilitation
Topic 10: Project Management	Write a project management plan
Topic 11: Formative Evaluation	Conduct formative evaluation Revise the course

Topic 5: Developing a Course Outline

Instructor's Notes

What is a course outline?

The course outline is simply the list of the course modules. It is similar to a table of contents in a book or the outline used for writing papers. The outline defines the scope and content of your course.

The outline is closely linked with the goals and objectives, which you can use to develop the outline. Once you establish your course goals and objectives, you can organize them in the most logical way to present the information..

Exercise caution to avoid cramming too much into a course. Often, instructional designers develop the goals and objectives for the course only to realize that what they originally wanted to accomplish was overly ambitious. They then revise the goals and objectives (slash and burn) and the course outline is also revised.

In most cases, less is more.

Topic 5: Developing a Course Outline

Assignment

Step 1. Write your course outline.

Use your course objectives as the basis for developing an outline.

Enter your outline in the Measurable Objectives section of the Curriculum Wizard.

Step 2. If you already have a course outline begin to answer the following questions:

- Identify the topic you love to teach and find a way to translate that to the online experience.
- Look at your course outline. What sounds scary, intimidating, or problematic to do online?
- What are some ways to address your own fears or those of your colleagues?

Topic 6: Developing an Online Assignment and Providing Feedback

“What we have to learn to do, we learn by doing”

—Aristotle

Goal

Develop an assignment for one module and describe the type of feedback the student will receive. Use Bloom’s Taxonomy to categorize the level of cognition involved in the assignment.

Objectives

Students will:

- develop an assignment for one module
- describe the type of feedback students will receive
- categorize the assignment according to Bloom’s Taxonomy
- review **Key Questions for Online Courses**

Warm-up Quiz

Which of these learning activities do you enjoy the most?

One a scale of 1–10 (1 indicating least desired; 10 most desired) rate the following:

Analyzing	Panel discussion
Brainstorming online	Personal action plan
Building Web pages	Personal reaction papers
Calculating	Polling
Comparing	Ranking
Creating art work	Rating
Creative writing	Rebuttals
Critiquing	Researching
Developing checklists	Role playing
Developing taxonomies	Simulations
Experimenting	Structured discussion
Group projects	True/False quiz
Identifying	What Ifs... ?
Illustrating	Writing case study
Individual projects	Writing essays
Journals	Writing short answer papers
Matching/Drag and Drop	Add your favorites _____
Multiple-choice quiz	

Topic 6: Developing the Assignments

Instructor's Notes

Teachers open the door. You enter by yourself.

—Chinese Proverb

One of the most challenging jobs as a course developer is developing engaging assignments.

Use the goals and objectives to define and develop the activities. The assignment for a module should be directly related to the module goals and objectives. For example, if you compare the objectives of this module with the assignment you see they are very closely related.

Objectives Students will:	Assignment
<ul style="list-style-type: none"> ▪ Develop an assignment for a module ▪ Articulate the type of feedback students will receive 	<p>Step 1. Develop an assignment for your module.</p> <p>Based on your measurable objectives, draft an assignment for one module. Include the feedback the student will receive and how it will be assessed.</p>
<ul style="list-style-type: none"> • Categorize the assignment according to Bloom's Taxonomy 	<p>Step 2. Identify the level of cognition this assignment requires according to Bloom's Taxonomy.</p>
<ul style="list-style-type: none"> • Review Key Questions for Online Courses 	<p>Step 3. Review Key Questions for Online Courses. (<i>See Topic 2</i>) How can you improve the activity and feedback?</p>
	<p>Step 4. Enter one module's assignment and decide how it will be assessed in the Assignment section of the Curriculum Wizard</p>

Feedback and Assessment

Feedback is key to learning. All assignments should include feedback. The feedback should be designed to help the student accomplish the module objectives and to deepen the learning.

When designing an activity or assignment it is important to define the quantity, quality, and immediacy of feedback students will receive.

- What type of feedback will be the most constructive in taking them beyond what they already know?
- Think realistically about what type of feedback could be most helpful for students and what that would require on the part of the instructor.
- Course developers need to examine how much feedback students will receive, how soon will they receive it, and how that feedback will be incorporated into furthering the students understanding.
- Some feedback can be automated by online quizzes that serve as study guides. When students get incorrect answers they can be provided with links about where to go to get the correct answer. Feedback in an assignment is different than (?) a final assessment. Feedback in an automated quiz should serve as a study guide to promote the learning and not take on a punitive function.

Example:

Final Assessment Feedback:

“You got two questions wrong.”

Sub-text of that Message

“You should have studied.”

Study Guide Feedback

“You got these two questions wrong. Here are some links on where to find information on these two questions.”

“Keep studying until you understand.”

- Some assignments can require peer feedback. Many of the most successful online courses use peer review as the primary mode of feedback. Many online teachers find that it is helpful for the teacher to maintain some participation in facilitating the peer feedback.
- Some assignments require feedback directly from the teacher.

In the traditional classroom teachers set policies about asking questions, seeking help, and when assignments will be returned to students. In the online world, this type of communication is crucial.

How to Structure Assignments

Start with ideas and activities to answer the student's question, "What's in it for me?"

Robert Mager states in "Making Instruction Work":

"Move from the big picture into the details. Since you know the subject, you can think comfortably about any piece of it and understand where it fits into the whole territory: They need a map. That's what you're there for. So start with the biggest picture and then work toward the details..."

"... Don't expect students to think about the abstract until they have something concrete to think abstractly about."

Types of Assignments

Assignments fall into two classes: **objective** or **inquisitive**.

Objective Assignments

Objective assignments are used to assess, review, and apply factual information.

A learner can select from multiple-choice answers and receive feedback. If the instructor uses a course management system, the grades can be automatically posted in the grade book.

Use Objective Assignments to:

- automate grading
- reinforce mastery of factual information
- provide learners with instant feedback

Most objective assignments ask learners to interact only with the content—not with each other or the instructor. Objective assignments are ideal for the multiple-choice format.

There are **three** basic functions of objective quizzes and tests:

- The gate—the student must master this content before advancing.
- The onramp—the quiz can be used as a study guide where the computer gives constructive feedback until the student gets it right (*Example: Goal or Objective Quiz*).
- Assessment—to assess how well the student mastered the information. The grade they receive goes right into the grade book.

Examples of Objective Assignments

- Multiple Choice and True/False Tests and Quizzes.
- Fill in the Blank assignments and tests.
- Rubrics where students circle or check the most appropriate ratings for themselves, then fix the errors. (*See the "Developing an Effective Online Course" Web site for examples*)

Inquisitive Assignments

Inquisitive assignments help people reflect, analyze, and extend the learning. Some teachers with large numbers of students use combinations of collaborative inquisitive assignments and objectives assignments. They often offer the collaborative inquisitive assignments as extra credit or in lieu of a quiz or test. That way, the students who show initiative take advantage of the collaborative project, but the instructor doesn't have to spend an inordinate amount of time prodding and helping students with group projects.

Use Inquisitive Assignments to:

- apply complex ideas or procedures
- demonstrate comprehension of complex ideas
- develop a project plan (budget, management plan, or publicity campaign)
- encourage creative thinking
- encourage questioning of abstract ideas
- spark the growth of unique view points and perspectives

Examples of Inquisitive Assignments:

- write (article, review, essay, report, *etc.*)
- create a Web site
- create artwork (icons, illustrations, photographs)
- exercise critical thinking skills
- experiment
- explore with interactive simulations
- foster group discussion
- participate in a critique lab (students post their work and other students critique their work)
- research
- summarize

Examples of Interactive Simulations:

(**Note:** You will need the Shockwave plug-in to view these interactive multimedia projects.)

1. Nutrition instructor Betty Clamp designed a series of interactive lessons. Students read text, view videos and animations, and then perform diet analysis by experimenting with an interactive online calorie and body mass calculator.
<http://www.ohlone.cc.ca.us/instr/cfs/fuelinfood.htm>
2. "Explore Science" features highly interactive science activities for students and educators allowing users to change variables and see how that effects the outcome. For instance, students can learn about additive and subtractive color by changing the values and seeing the results.
<http://www.explorescience.com>

3. The SF Exploratorium has some innovative interactive exhibits allowing users to experiment with variables to see how the changes effect outcomes.
<http://www.exploratorium.org/exhibits/index.html>
4. Round World Media developed several interactive lessons including an interactive linear regression calculator that allows users to enter in the x, y coordinates of points to plot a line of best fit and identify outliers and an online statistics lab.
<http://www.roundworldmedia.com/demo/demo.html>

Create an Online Community in your Class

There are basically **three** types of collaboration involved with online learning.

1. group project in which the participants produce something
2. group discussions in which the participants discuss topics
3. peer critiques in which people in groups provide constructive criticism to each other's work

Topic 6: Developing Assignments

Assignment

- Step 1.** Based on your measurable objectives, draft an assignment for one module. Include the feedback the student will receive and how it will be assessed.
- Step 2.** Identify the level of cognition this assignment requires according to Bloom's Taxonomy.
- Step 3.** Review **Key Questions for Online Courses**. (*See Topic 2*) How can you improve the activity and feedback?
- Step 4.** Enter one module's assignment and decide how it will be assessed in the Assignment section of the Curriculum Wizard.

Topic 7: Developing the Instructor's Notes

“There are five rules that make up good writing. Unfortunately, no one knows what they are.”

—William K. Zinsser, *On Writing Well: The Classic Guide to Writing Nonfiction*

Goal

Develop the Instructor's Notes for one module.

Objectives

Students will:

- determine the content of the Instructor's Notes
- choose the best way to communicate the information

Warm-up Activity

Imagine you were enrolling in the course you are developing, what would you hope the teacher would communicate? In a perfect world, what medium would it be communicated in?

Topic 7: Developing Your Instructor's Notes

Instructor's Notes

"I am not a teacher but an awakener."

—Robert Frost, American poet

The purpose of the Instructor's Notes is to close the gap between what people already know and what they need to know in order to perform the module objectives.

In "Making Instruction Work," Robert F. Mager proposes the following formula for determining the content (in this case, the Instructor's Notes):

$$\begin{aligned} & \text{What needs to be known} \\ & \text{(minus) - } \underline{\text{What is already known}} \\ & \text{(equals) = What needs to be taught} \end{aligned}$$

To determine what content to include in your Instructor's Notes, first review your objectives for one module.

Ask yourself:

"What prevents the student from already practicing the objective?"

- Does the student need to know common errors to avoid?
- Does the student need to know a procedure?
- Are examples necessary?
- Does the student need to read theory, history, or basic concepts?
- Does the student need to acquire factual information?

Did I remember to:

- Discuss the relevance of the module to the student?
- Clarify how this module fits into the big picture?
- Provide logical guidelines, or a clear model, for competent performance?
- Describe or demonstrate "how to"?
- Offer specific alternatives to address diverse learning styles?

Which Medium is Best?

The best way to communicate information depends on what you are communicating and why.

According to two folks at Unext.com, Jakob Nielsen and Donald Norman:

<http://www.jnd.org/index.html>

"We believe that education comes first, technology second. We exploit the power of each specific medium: Books, lectures, videos, the Internet, and the computer.

Books: Still the best presentation medium

Lectures and Videos of Lectures: Best for motivation and engagement, not for teaching

The Internet: A powerful tool for knowledge management, for social interaction, and for current events

The Computer: A powerful tool for simulation, allowing learners to explore the concepts they are learning and to try them out to see their impact”

More and more, teachers and instructional designers agree with the findings of Nielsen and Norman and are using books and videos as the delivery medium of whatever “content” is communicated.

Developing the content for an online course (like this one) is equivalent to writing a book. Unless you’ve already written the textbook for your course, the most practical approach is to create a course for which students use other media (books, Web sites, videos, interactive CD-ROMs) to get background information. Then you, as the teacher, can concentrate on developing meaningful assignments to help students contextualize, reflect, and build on what they learned via other media.

There are basically **three** ways to deliver the course content or Instructor’s Notes:

- Majority of the content is online
- Majority of the content is via other media, such as books, video, or audio (online components are reserved to facilitate collaborative work and online discussion)
- Teachers offer content online to provide context, in addition to introducing material presented in other media, such as books and videos

Types of online courses with content online:

(See the “Developing an Effective Online Course” Web site for examples.)

- Text-based
- Text with graphics
- Text with graphics and interactive multimedia
- Animated lessons
- Interactive tutorials
- Video online
- Audio online
- Audio with graphics and transcript
- Textbook based. All the content is in the textbook. The syllabus, however, is online and assignments are submitted electronically.
- Combinations of different media (VHS, broadcast video, Web, books, teacher guides, workbooks, and online components)

The Public Broadcast Service (PBS) offers tele-Web courses. The majority of the content is delivered via traditional media, such as books and video. The assignments, course discussion, tests, and any additional information are on the Web site.

PBS Adult Learning Services—teleWeb courses include

http://www.pbs.org/als/guide/using_guide/about_courses/telewebcourses.htm

Programs: Full audiovisual, documentary-style learning experiences featuring outstanding professors, on-location footage, and enlightening interviews

Internet Component: Offers students interactivity, a sense of community, and extensive Web-based resources and activities that reinforce course lessons Textbook

Student study guide

Faculty manual

Topic 7: Developing the Instructor's Notes Assignment

Step 1. Write the Instructor's notes for one module.

Enter your Instructor's Notes into the Instructor's Notes section of the Curriculum Wizard.

Step 2. Discuss how your Instructor's Notes can take advantage of the online environment.

Topic 8: Web Design and Accessibility

“No matter how good the content is, if it’s not accessible—they won’t read it.”

—Vilma Bravo

Goal

Draft a plan outlining the guidelines you will use to design your course so it is accessible and easy to read and navigate.

Objectives

Students will:

- identify basic Web design principles
- identify basic accessibility requirements
- draft a plan outlining the guidelines you will use to design your course so it is accessible and easy to read and navigate

Warm-up Activity

Look at a few of the most popular sites on the Web such as msn.com, yahoo.com, ZDnet.com, Cnet.com or ESPN.com. What do you notice about the Web design?

Topic 8: Web Design and Accessibility

Instructor's Notes

“Art has to move you and design does not, unless it’s a good design for a bus.”

—David Hockney, English artist, draftsman, printmaker

Web Design Tips

Good Web design means your site achieves its goals and objectives with minimal obstacles to the user.

Good design is CRAP: Humorous acronyms aside, you’ll find this is the key to the four essential elements of good graphic design.

- Contrast—Add variety by making dissimilar elements look different
- Repetition—Add unity by repeating elements
- Alignment—Create visual connections between elements
- Proximity—Group related items together

A few basic tips:

Tip 1: Uphold user-friendliness (the most important design principle)

- Keep the user in mind.
- Even if your fabulous design makes perfect sense to you, if others are bogged down it is not effective interface design.
- Only design that is understood is truly effective. The designer’s opinion is secondary.
- Web sites should be accessible.

For public institutions in the United States Web sites must be accessible to people with disabilities such as low vision, blindness and color blindness, hearing impairments, and people who cannot use a mouse. The World Wide Web Consortium (WC3) has developed a list of “Checkpoints for the Web Content Accessibility Guidelines” for Web designers to follow. *(See Web Design and Accessibility page on the “Developing an Effective Online Course” Web site for links.)*

The Guidelines are quite extensive and complex. The following is a summary of a few of the key checkpoints identified as Priority 1 by the WC3.

- Provide a text equivalent describing the images (graphics, animation, video) for people using a screen reader or browsing without images.
- Provide text equivalent describing any important sounds for people who are hard of hearing or deaf.
- Avoid using frames (if you don’t know what frames are you are probably not using them). It is difficult for people with screen readers to navigate frames.
- Avoid combinations of red and green for colorblind people (8-12% of the population).
- Keep navigation simple for people with motor impairments.

Tip 2: Functionality first.

- Function over form: Make it readable and accessible...then make it pretty.
- Don't substitute functionality for art—make the art fit the functionality This sounds exceedingly simple, but all too often people begin developing the art only to find that it does not meet the technical constraints or the overall goals and objectives. Begin by developing the content of your site and then develop the art to accommodate the functionality.
- Avoid 'click' and 'click again'.
- Don't bury information in your site.
- You should be able to get what you want in two or three clicks.
- If you have a large site, create a site map, index, or table of contents so students can find information.

Tip 3: Grouping items

- Group things that are similar by color, shape, and proximity.
- Make dissimilar things look different.
- Accentuate things that are clickable.
- Reserve blue text for clickable items.

Tip 4: Question your interface: Can I turn this on its head? Can I simplify?

- Effective design is often a matter of compromise; a balance between competing goals and objectives.
- According to Dr. George Bracket, "Sometimes a picture is worth a thousand words but sometimes a word is better than a picture." How do we symbolize a word? If the word is 'volume,' you can show a picture of a speaker; however, if the word is 'quit,' you can show a picture of...? It's possible the word quit is more effective than its icon.

Tip 5: Chose typestyles that increase reading comprehension.

- In the online environment sans-serif fonts such as Ariel, Helvetica and Verdana are easier to read.

Caps—DO NOT USE ALL CAPITAL FOR SENTANCES THAT ARE MORE THAN FOUR WORDS IN LENGTH. CAPITAL LETTERS ARE HARD TO READ. MANY PEOPLE BELIEVE THAT USING CAPITAL LETTERS WILL CALL ATTENTION TO THEIR MESSAGE, BUT IN REALITY MOST PEOPLE TEND TO SKIP ENTIRELY CAPITALIZED TEXT. Many people interpret all caps as YELLING!

Bold—**Bold typeface should be used sparingly. Boldface is great for headers but after ten words in running text it is difficult to read, especially for people with vision impairment. Most people tend to skip long sentences or paragraphs written in boldface font.**

Tip 6: Use tables to lay out your text. Studies show that reading comprehension increases if each line of text is no more than 10–15 words across. Most English language print material is laid out with no more than an average of 10–15 words on each row. If text is permitted to adjust to the size of the screen, it can be challenging to comprehend and retain what you read. Most professional Web sites use tables to constrain the size of the text so it doesn't go across the entire screen. *(For more information on tables see Diane Wang's course "HTML" and read the module on how to create tables in HTML <http://think-ink.net/html/table.htm>)*

Rubric for Web Design and Accessibility

Many of examples on this page are of sites with great content but could be improved by applying the principles of good Web design and Accessibility.

What counts?	Competent Work	Common Mistake	Needs to be Revised	Missed the Point
Accessibility	Validated by Bobby and HTML Validation Service	No alt tags on images and no narration text for audio	Uses frames and main frame is not labeled	No alt tags, no narration text for audio, inappropriate use of color, uses frames, doesn't validate
Background	The background doesn't interfere with the text and compliments the graphics	The background is distracting and makes the text hard to read	The background color or pattern makes the text extremely difficult to read	The background is too busy and the text is almost unreadable
Text	Text is easy to read and is within a column of no more than 10—12 words across with plenty of white space on both sides	The text stretches all the way across the page	Sentences with more than four words in: all caps, italic, bold, or underlined. Words that are underlined but are not links.	Typos interspersed in unreadable text
Links	Clearly labeled links that are easy to identify as links	Links that are not clear about where they take you	Links that are not underlined and not clearly links	Dead links or links that take you to page “under construction”
Graphics	Graphics enhance the site's message. Graphics should complement or show what words cannot.	Graphics with no alt tags	Graphics are too large or too small	Distracting graphics
Animation	Animation illustrates the point	Animation adds pizzazz but doesn't illustrate the point. Animation does not deliver a clear message.	Animated intro pages with no “skip intro” button. Distracting animations	Animations that deters users from getting the info they need
Graphic Design	The focal point of the page is clear	Unidentifiable focal point	Cluttered—multiple alignments	Pages that look OK in one browser but not in another
Site Design	The site is easy to navigate and the design is consistent throughout the site	All the pages are not easily accessible and the pages don't have a common theme	The navigation is confusing and some pages are dead ends	Sites with links to pages 'under construction'. Sites that don't allow you to use the back button.

Topic 8: Web Design and Accessibility Assignment

- Step 1.** Draft a plan outlining the guidelines you will use to design your course so it is accessible and easy to read and navigate.

Topic 9: Developing a Management Plan

“The best laid plans...”

Goals

Review issues of course management and facilitation.

Objectives

Students will:

- define a policy for group work, ‘netiquette’, and student expectations
- develop a plan on how to complete your course

Warm-up Activity

What worked well in the management and facilitation of this course? What would you do differently online?

Topic 9: Developing a Management Plan

Instructor's Notes

Creating a Plan for Managing Your Course

As you design a course it is important to consider how the course will be managed. While many of the traditional rules of how courses are conducted can be assimilated into the online environment, some cannot.

A few of the key course management issues

- How will communications with the students be tracked and organized?
- How will homework assignments be submitted, tracked and organized?
- How will discussions between students be handled?
- If you require online discussion, how will it be graded? Who will facilitate it?
- Will the instructor play a role in the online discussion?
- How will collaborative assignments be graded, organized, tracked, and submitted?
- How will groups be formed?
- How much feedback should students expect?
- How soon should students expect to receive feedback?
- How will late submissions be handled?
- How will technical failures be handled? If the student says, “*The dog ate my hard drive.*” or “*My electricity was shut off in a roving <rolling?>> blackout.*” how will that be handled?
- What are the rules of etiquette in the online environment? What ‘netiquette’ policy will you institute? How will rude students, aggressive students, and students who don’t participate be handled?
- What is the ideal number of students per section?
- What institutional support will be available to you and the students for technical help?
- If there are attendance requirements at the institution you are working with how will you address that?
- Will you hold “office hours” where you can be reached in person, by phone, chat, or instant messenger?
- Will the course be inside a course management system?

Course Management Systems

Teaching an online course can be very time consuming. Many institutions have adopted Course Management Systems also called Learning Management Systems. The Course Management Systems are software packages that integrate a series of tools that help teachers and

administrators track and communicate with students. Most of the software currently available bundles all the administrative features into one integrated system that includes:

1. a site for each course and each section with
 - a list of all students and teachers with email messaging
 - chat
 - discussion board
 - automated grading functions for tests and quizzes
 - ftp sites for uploading and sharing student work
 - collaborative online white boards where one person can draw and all others logged on can see and comment
 - announcement boards
2. HTML editors and templates making it easy to format, upload and link Web pages
3. integration with institutional tracking and registration systems
4. secure logins for administrators, teachers, and students

The drawbacks of the using these packages are:

- there is a learning curve required in learning to navigate through yet another software tool for both teachers and students
- the Course Management Systems packages are expensive
- the collaborative learning tools are quite primitive
- versions are frequently upgraded and are proprietary

Netiquette

Netiquette is the name of the etiquette or social protocol instituted by an instructor in the online environment. It is important to let the students know what the standards are for communication in the group.

According to Lynnette R. Porter in *Creating the Virtual Classroom* this list will help make your email communication more effective.

- Keep messages short. A short message is easier to read and respond to than a long scrollable message.
- Get to the point. State the purpose of your message and use a direct style.
- Be polite. Brevity doesn't mean abruptness. Request information and explain why you need it or how it will be used.
- Indicate if you are responding to someone else's message. Thank the person who'll receive the message for the information you are requesting.
- Write coherent, grammatically correct messages.
- Email should be less formal than a letter, memorandum, or other document, but it should still follow the conventions of Standard English.

- Know where you are sending the message. If you intend to send message to a mailing list or newsgroup, for example, check the address to ensure the message will be sent to the entire group.
- If you are sending a message to only one individual from a group, double-check the address to ensure that your message is going to only that person. Otherwise you may find yourself in the embarrassing situation of sending a personal message to an entire group.
- Make sure the receiver knows at a glance who sent the message.
This is especially important if your username is different from your actual name.

Topic 9: Developing a Management Plan Assignment

Step 1. Review netiquette policies for other online courses (*See Links to Online Course page of “Developing an Effective Online Course” Web site.*)

Find elements from other netiquette policies and define the netiquette policy you will use for your course.

Step 2. Define a policy to manage students’ expectations about the feedback you will give them.

Given the class size you are expecting, how will you manage answering questions, giving feedback, grading assignments, and taking tests?

Step 3. Find out if the institution you work with has Course Management Software. If so, how will you make use of it?

Step 4. Create a Project Management Plan. You can then use the Project Management Plan as a proposal for grants, a sabbatical, or release time. (*See Topic 1 for more information on the production process.*)

Include the following:

- a flow chart of the course, if appropriate
- a milestone calendar indicating the estimated time it will take to complete each task. Add an additional 10—20% for formative evaluation (*See Topic 10*)
- a plan for formative evaluation (*See Topic 10*)
- an asset list defining what text, graphics, rich media, or programming you will need to develop
- how will your course be managed? Will you use course management systems or other tools? How many hours per week do you plan to spend teaching and managing the course?

Topic 10: Formative Evaluation

“A common mistake that people make when trying to design something completely foolproof is to underestimate the ingenuity of complete fools.”

—Douglas Adams, Mostly Fools

Goals

Conduct formative evaluation and revise your course

Objectives

Students will:

- conduct testing on at least three members of the target audience
- write up test results
- prioritize changes
- create a plan for revising the course

Warm-up Activity

What is the easiest way to find out what someone wants?

Topic 10: Formative Evaluation

Instructor's Notes

“Research is formalized curiosity. It is poking and prying with a purpose.”

—Zora Neale Hurston, *Dust Tracks on a Road*

Prior to publishing a course, two basic types of testing is recommended:

- 1) Quality assurance
- 2) Formative evaluation

Quality assurance testing is done at the final stages of your project and is designed to catch technical problems and typos.

Formative evaluation helps you find out if you are achieving your goals and objectives in the formative stages of your project, instead of waiting until you are have finished the project. It provides way to test both the form and content of your course

The American Dental Association describes formative evaluation as:

Formative evaluation is an important method to assure that the developed software meets requirements on several levels, such as usability, functionality, and instructional effectiveness. Formative evaluation allows developers to assess the program during development. For instance, developers may elect to test an early version of the program with users to identify weaknesses in the user interface or other areas. <http://www.ada.org/prof/prac/stands/index.html>

An important part of formative evaluation for online courses are ‘usability studies.’ *In Don't Make Me Think: a common sense approach to Web Usability* Steve Krug defines the importance of user testing:

“If you want a great site, you've got to test. After you've worked on a site for even a few weeks, you can't see it freshly anymore. You know too much. The only way to find out if it really works is to test it.

Testing reminds you that not every one thinks the way you do, knows what you know: uses the Web the way you do.”

Robert Mager defined three key questions to research during formative evaluation in his book *Making Instruction Work*.

- Does your course accomplish what it is supposed to?
- Is it of value?
- Does it impose minimum obstacles between the student and the learning?

Ease of Use

Ease of use, now often called “usability ” is studied to ensure that the interface doesn’t get in the way of the learning. Key questions regarding usability are:

- Are students able to understand instructions?
- Are students able to navigate through the course?
- Is it obvious where they are supposed to click first?
- Are the headings and buttons clearly labeled?
- Is it visually appealing and easy to read?

Evaluating the Content

One of the most powerful reasons to conduct formative evaluation is to determine that your message is clear.

In designing your plan for conducting formative evaluation, strive to develop test methods that will answer the following questions:

- Did I achieve my goals and objectives?
- What were the obstacles?
- Did the students benefit in the way I intended?
- What were the unintended consequences?

Unintended Consequences

“The true worth of a researcher lies in pursuing what he did not seek in his experiment as well as what he sought.”

—Claude Bernard, (1813—1878) French physiologist

During formative evaluation, be alert to notice the unintended consequences, which can be more powerful than the intended consequences. Unintended consequences are when you had the intention of providing one service or message and users interpret and practice it in ways you didn’t think of. The unintended consequences can be beneficial or quite negative.

Examples of unintended consequences

- 1) During the early days of anti-drug films, young people learned new-and-improved ways to actually use drugs by watching movies that depicted behavior that was, ironically, designed to discourage drug use.
- 2) Under the Americans with Disabilities Act, television broadcasters are required to provide closed-captioned programming to make broadcasts accessible to people who are hearing impaired or deaf. As it turned out the appeal of closed-captions goes far beyond its intended use and is also enjoyed by people learning to read, people learning a second language, and people who want to watch TV but don’t want to disturb others with the sound in places like restaurants, bars and bedrooms.

The unintended consequences often have more significance than one might think.

When to Test

Formative evaluation should be conducted at every stage of development to ensure the course is achieving its goals and objectives. The earlier you begin formative evaluation the more likely you'll be to have an effective course in the end. Dr. Gerold Lesser, from the Harvard Graduate School of Education, recommends allocating ten to twenty percent of your project budget to formative evaluation.

What a Test Plan Should Include

- Define what you are testing for. Asking students to perform certain tasks can help you determine the effectiveness of the instruction. For example, ask the student to find a particular piece of information or respond to a particular question.
- Define when and how long each testing session will be.
- Define where you'll test and on what equipment.
- Define your target audience members, including how you plan to select them.
- Define your testing methods.
- Ideally, you should test people who offer diversity in terms of age, experience, geographical location, educational level, gender, income, race, and ethnicity. Who you select as your group of testers is important. Even within a narrow target audience people differ greatly.
- What type of computers will you use? What type of Internet connection and browser will you select?

Examples of commonly used testing methods:

- Asynchronous discussion—via listserv or bulletin boards.
- Focus groups—Have several people test the product and then observe their conversation about the product. You begin by giving them a set of general questions, and then observe and write down their behavior and comments. If they get off track you can redirect their conversation, but your input should be minimal.
- Observation—This is usually done by observing one or two people using the product. Record where they click, how long things take to finish, at what point they ask questions, etc. Ask questions upon completion.
- Online chat interview—Conduct one-on-one, or group discussions for direct feedback.
- Pre- and post-tests—Test people before and after viewing a unit of instruction to measure strengths and weaknesses, as well as whether the instruction is necessary.
- *Example:* Can the person write HTML tags before the class? Can they write the tags after the class? What were the problem areas?
- Surveys—Users can complete a survey to rate the instruction. These are useful only if you are going to do mass testing of the product and are looking for trends (*e.g.*, in things like appeal of the course, graphic design, or first impressions). In general, people do not give serious consideration or thought to answering survey questions.

Topic 10: Formative Evaluation Assignment

- Step 1.** Write a plan for conducting formative evaluation.
- Step 2.** Make arrangements with three member of your target audience (students) to conduct the testing.

Topic 11: Conducting Formative Evaluation

“Honest criticism is hard to take, particularly from a relative, a friend, an acquaintance, or a stranger.”

—Franklin P. Jones

Goal

Conduct formative evaluation and revise your course.

Objectives

Students will:

- conduct formative evaluation on at least three members of the target audience
- write up and analyze results
- prioritize changes
- develop a plan of action to improve the course

Warm-up Activity

This warm-up activity helps you prepare for revising your work, which in effect, is like self-criticism. Ouch. To ease the painful process of revising your own work, repeat the following phrases out loud if you are alone. If people are near by, write them down.

- Even Shakespeare revised his prose.
- Great artists, including Leonardo Da Vinci, sketch before they paint.
- Martha Stewart updates her décor.
- Revision is essential to the development process.

Topic 11: Conducting Formative Evaluation Instructor's Notes

“I don't like the color' What you can count on at least one user saying in every usability test.”

—Steve Krug, *Don't Make Me Think: A Common Sense Approach to Web Usability*

Once you have developed a plan for formative evaluation, the next step is to test your course via the target audience.

During the testing it is important not to influence those evaluating your project. Explain that you need help improving your course. Often, if you mention the word “testing,” people immediately feel they are the ones being tested. Subsequently, the target audience member will want to give the “correct” answer, rather than an honest opinion. So in order to avoid scaring the testers you can say you are conducting “usability studies” to improve your course.

Jacob Nielsen, an expert in the field of usability studies suggested the following at the Online Learning Conference in October 2001.

Inform the target audience member “This study is to find out what could be better. As you are working please think out loud. Tell me what you are thinking. If you are reading, please read it out loud. If you are surprised, let me know. If you understand something or find some thing clear or unclear please let me know.”

Formative evaluation is mainly about observing. Observe and record the body language as well as the comments of the users. Write down everything you observe and everything they say. You will need this information to analyze the results.

“Now that I've collected the data, what do I do with it?”

After you conduct formative evaluation, begin to analyze the data. Where did users perceive problems? What did you observe? Were there any surprises?

Sometimes you may not agree with what the testers say. Sometime if you ask three people you get three conflicting answers. Ultimately the course is yours so use your judgement to evaluate the weight you will give each comment. Jacob Nielsen recommends that you take what the users do (where they click, what they read first) much more seriously than what they say.

Once you have analyzed the data, decide what should be changed. When you've identified where to make improvements, make a priorities list.

Top priorities:

- Identify a clear relationship between the course objectives, course outline, instructor's notes and assignments.
- Eliminate unnecessary content.
- Make the goals and objectives relevant.
- Provide motivation or reasons to learn.
- Create a site map, index, or table of contents.
- Improve the course navigation and page layout.
- Polish the writing, formatting, grammar, and spelling.

Topic 11: Conducting Formative Evaluation Assignment

Step 1. Conduct Formative Evaluation.

Conduct testing on at least three members of the target audience.

Make sure to ask the subjects your important questions if the answers aren't apparent from their feedback.

Step 2. Document the results.

Step 3. Review **Key Questions for Online Courses** (*see Topic 2*) and review your course to see if additional improvements are needed.

Step 4. Prioritize changes.

Step 5. Create a plan for revising your course.

Describe the changes you will make and provide your reasons. Add the summary of your formative evaluation to the Project Management report on the Curriculum Wizard.

Conclusion

Online Education is a huge and awakening field with expanding capabilities and opportunities. As the technology moves at breakneck speed its our job as educators to make sure that the tools are infused with sound pedagogical principals and that we find communication tools and teaching methodologies that best suit the learning outcomes of the subject matter and students we are teaching.