

Instructional Design in ANGEL



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Introduction

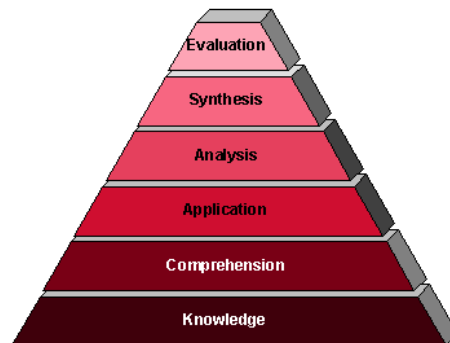
ANGEL provides a powerful tool for helping students to learn; however, as with any technology tool, it takes time and effort to build quality courses in ANGEL. Applying appropriate instructional design principles can help you to use ANGEL more effectively. The purpose of this document is to give ANGEL instructors, designers, and administrators a working knowledge of instructional design, and the ability to apply that design to the courses they're developing in ANGEL. This document discusses some of the fundamental principles of instructional design and then moves on to the various components of ANGEL, demonstrating how to apply instructional design in these areas.

What Is Instructional Design?

Instructional design is the systematic development of instruction by using learning and instructional research and theories, as well as established best practices, to ensure the quality of classroom/course materials. Instructional design is the entire process of analyzing the needs of a group of learners, identifying objectives, and developing learning objects. Using ANGEL, the process of instructional design then moves to how you arrange and deploy learning objects within an ANGEL course. It includes the development of instructional materials/activities, along with the evaluation of the learning objects. It's important to remember that instructional design is an ongoing process. After instruction and then evaluation are complete, the process begins again.

Instructional Design and Bloom's Taxonomy

In the mid-1950s, Benjamin Bloom developed a taxonomy of learning objectives for education, which was used as an assessment tool for learning and a way to communicate expectations to students. This taxonomy contained three overlapping domains: cognitive, psychomotor, and affective. Bloom identified six levels in the cognitive domain, from the simple recall or recognition of facts to the highest level, evaluation of the material. Bloom found that a high percentage of test questions and classroom activities at that time focused primarily on recall or recognition of facts. Bloom's research provided a foundation for research in instructional design, where researchers and instructors tried to answer this fundamental question: How can we help students to learn more effectively?



Research has shown that the key is to produce materials that force students to synthesize and evaluate ideas, thus moving them higher on Bloom's Taxonomy (Bloom 1956). Relating this fact to current educational objectives, driven by student-centered learning, the most important outcome is the learner's ability to move up the "pyramid" and begin to achieve new knowledge and deeper levels of understanding.

As an instructor, how do you build content that moves students up Bloom's learning hierarchy? The easiest method is to look at Bloom's pyramid not as one solid state, but

rather as a series of building blocks that someone must climb. In some cases, activities should be developed that are simply for building knowledge—laying the foundation for learning. These steps can be completed in ANGEL with a simple fact-based quiz or uploading a PowerPoint walkthrough. The next building blocks, comprehension and application, can be achieved through a read-and-respond activity or a practice problem set, using a drop box or a more elaborate quiz. Analysis and synthesis activities can be created using the discussion forums, by giving the student a scenario in which he or she must post an answer and respond to someone else, or by having project teams look at submissions and summarize with a "strengths, weaknesses, opportunities, and threats" (SWOT) model. Peer evaluation can occur through peer discussion forums and the concept of peer grading through drop boxes.

In a fully-online course, each module should have activities that drive learners to the top of the pyramid; in a supplemental format, more analysis and synthesis of information may take place in the classroom. These are simply some examples to get you started on creating a course with rich instructional material.

The following table provides an overview of Bloom's taxonomy, listing the learning verbs associated with each level, as well as a brief summary of the skills to be displayed at that level. The verbs are helpful in developing learning goals for activity and course objectives in ANGEL. The higher up the pyramid, the more learning that takes place; therefore, developing activities in ANGEL that allow learners to analyze and synthesize information will greatly increase the effectiveness of your instruction.

Competence	Verbs	Skills Displayed
Knowledge	Arrange, define, duplicate, label, list, memorize, name, order, recognize, relate, recall, repeat	Involves the recall of specifics and universals; the recall of methods and processes; or the recall of patterns, structure, or settings (Nitko 1983)
Comprehension	Classify, describe, discuss, explain, express, identify, indicate, locate, recognize, report, restate, review, select, translate	Lowest level of understanding; knows what is being communicated and can use that material but cannot link the material to other ideas or see the big picture (Nitko 1983)
Application	Apply, choose, demonstrate, dramatize, employ, illustrate, interpret, operate, practice, schedule, sketch, solve, use, write	Uses the information; uses new methods, concepts, theories in new situations; solves problems
Analysis	Appraise, calculate, categorize, compare, contrast, criticize, differentiate, discriminate, distinguish, examine, experiment, question, test	Breaks down information into its components or parts; is able to see the relationship with other ideas; is able to see the relative hierarchy of ideas
Synthesis	Arrange, assemble, collect, compose, construct, create, design, develop, formulate, manage, organize, plan, prepare, propose	Uses old ideas to create new ideas; relates knowledge from several areas; is able to draw conclusions, putting together parts to form a whole
Evaluation	Argue, assess, choose, compare, defend, estimate, judge, predict, rate, score, support, value	Can make quantitative and qualitative judgments; recognizes the value of subjectivity; compares and discriminates between ideas

The ADDIE Model

The most well-known development strategy for instructional design consists of five phases: *analysis*, *design*, *development*, *implementation*, and *evaluation*. The ADDIE model is best used when developing training or instruction that involves psychomotor skills; however, because of its popularity, simplicity, and adaptability, this model also is used as a general foundation for the instructional design process.

The ADDIE model allows educators to create learning modules that are instructionally solid. You follow a step-by-step process for creating entire courses, starting with the analysis of a learning object and moving through the phases to the end evaluation of that learning object. Although most of the tasks in the ADDIE process occur outside of ANGEL, they're relevant to the end result: a more robust learning environment.

Analysis

Analysis is the process of defining specific learning needs. During this phase, the designer gathers content and general course information, analyzes the gathered data, and determines where development and needs are located in the curriculum. The outcome of this phase should be a completed ANGEL outline, explaining which activities and tools will be used in ANGEL. All of this phase happens outside of ANGEL, but is an essential element in developing instructionally sound courses.

Following are the objectives for this phase:

- Determine the course background and the materials to be covered.
- Define the target audience. This can be as simple as "high school senior Social Studies student," or more structured with prerequisite knowledge.
- Set the timeline for development of the course.
- Determine the content and assets that will be needed and/or developed.
- Determine the volatility of the content. (In other words, will the content change rapidly?)

Design

Design is the process of specifying how learning will occur in the ANGEL course, by determining the following:

- Learning objectives. What do you want the student to learn?
- Assessment. How will you assess that learning has occurred?
- Interactive tools. Discussions, forums, blogs, wikis, quizzes?
- Course structure. Fully online, hybrid, or supplemental?

After making these determinations, begin creating a design outline of a prototype course. This outline should be a snapshot of how your course will look in ANGEL.

Development

Development is the process of authoring and producing the actual ANGEL course. During this phase, ANGEL tools and structures are created, and all components are tested thoroughly. After completion, the entire course should be run through a pilot group of users who are one skill level higher than the primary audience. The test group should

look for mistakes in the developed content, from spelling errors to tools functioning incorrectly.

Implementation

Implementation is the simplest stage of the ADDIE model; simply deploy the final course to the target audience, through ANGEL.

Evaluation

Evaluation is the process of determining how effectively the course achieved the identified learning objectives. During this phase, instruments that measure the course's effectiveness are created, usually using the survey tool in ANGEL.

The evaluation instruments should be used to answer the following questions:

- Has the problem been solved?
- How much did the student learn?
- How well did the course work?
- Does the program need to be modified? If so, what changes need to be made?

Overview of the ADDIE Process

Stage	Description	Questions Answered	Tasks in ANGEL
Analysis	Define what is to be learned.	<ul style="list-style-type: none">• Who are the learners?• What is the problem?• How do we solve the problem?• What are the measurable goals or intended outcomes of the course?• What do learners need to know?• What is the content?	Analysis occurs independently from ANGEL, but is essential to developing a good course.
Design	Specify how learning will occur.	<ul style="list-style-type: none">• Learning objectives: What do we want learners to learn?• Assessment: How will we assess whether learning has occurred?• Interactive tools: What tools will we use (online discussions, blogs, wikis, quizzes, etc.)?• Course structure: Fully online, hybrid, or supplemental?	<ul style="list-style-type: none">• Understand the tools available in the ANGEL learning platform.• Identify the assessment techniques to be used in ANGEL.• Identify the ANGEL structure.
Development	Build the course in ANGEL and produce the materials.	<ul style="list-style-type: none">• How does the course look/sound?• Does the course meet appropriate quality standards?• Do students learn from the course?• How can we improve the course?	<ul style="list-style-type: none">• Build content in ANGEL.• Review content with peers.
Implementation	Release the developed course.	<ul style="list-style-type: none">• Is the instructor ready to take responsibility for the course?• Has the timetable for course rollout been developed?	Deliver the content through the course.

Stage	Description	Questions Answered	Tasks in ANGEL
Evaluation	Determine the impact of the instruction.	<ul style="list-style-type: none"> • Have we met our learning objectives? • How much did the student learn? • Does the course need to be modified? If so, what needs to be changed (content, steps of instruction, media, etc.)? 	<ul style="list-style-type: none"> • Evaluate reports generated by ANGEL. • Were students involved in discussion forums? • Did the student's performance meet learning objectives?

Learning Styles

Educators group learning styles into three distinct categories: visual, auditory, and interactive (kinesthetic). Most people use a combination of these learning types to make connections with and retain knowledge. The most important thing to remember is that everyone learns differently; you must build activities that meet all types of learners' needs.

Use the chart below as a guideline for creating your learning activities.

Learning Type	Classroom	Online Possibilities
Visual	Slides, demonstrations, overheads, or even writing on a chalkboard or flip chart—anything with which the eye can connect. Associate content with images.	Text on screen, tables, figures, photos, and diagrams to reinforce key concepts. In ANGEL, blogs, videos, games, and wikis are some tools to engage the visual learner.
Audio	Lectures are the most obvious form of auditory element in an in-person classroom. Class discussions, audiotapes, podcasts, or CDs are other options. Verbal assessments would be ideal for this group.	Audio narration in a podcast or WAV file. Recorded real-life analogy, delivered in a style to which an audio learning student would easily relate.
Interactive (kinesthetic)	Activities that require the learner to participate actively are the best choice with this learner. Taking notes is probably the most common format, but asking students to give demonstrations or participate in hands-on activities is another good way to engage them.	Uploading assignments to a drop box. Rollover tables, created using the HTML editor. Hyperlinks, periodic self-assessments with the quizzing or survey tool, games, simulations, and other interactive elements to force the student to take an active part in the course.

Types of Courses

There are three distinct types of course delivery methods for which you can use ANGEL: the online approach, the supplemental approach, and the hybrid approach. Each of these course types has its own set of goals and objectives based on audience and learning outcomes.

Online Approach

Over the last decade, online learning has become one of the most important forms of instruction, as the Internet and its tools have evolved to the point where much of the instruction that was traditionally performed in the classroom could be accessed more conveniently online. In a pure online course, the learning content, its presentation, and the delivery are critical, as this content is the user's only connection with the course. Most online learning includes interactive media or mini-simulation learning objects that keep learners engaged. Simply stated, online learning is any learning experience or environment that relies on the Internet as the primary delivery mode of communication and presentation.

In the traditional brick-and-mortar classroom, instructors can control the learning environment because all of the information being delivered to students is in the classroom. In an online learning environment, the student has instant access to resources, classmates, other experts, and other sources of information, and no longer depends on faculty as the monopolistic giver of information. Online learning is a collaborative, contextual, and active style of learning. The traditional role of the instructor must change from "the sage on the stage" to "the guide on the side"; instead of giving students all the answers in a lecture format, instructors need to become information facilitators. Instructors must use their knowledge to stimulate conversation and provide suggestions as to where relevant content can be found and how that content can be applied to the learning topic.

Just like in a traditional classroom, it's imperative that instructors in an online learning environment establish a set of learning goals and objectives. Then the instructor must look at the available online toolset to determine what activities can be created to meet the educational goals. These objectives should be clearly communicated with students, giving them the context they need to navigate the online learning environment.

The online learning environment allows for the instructor to adopt a full range of interactive methodologies. By thinking through the available tools and applying them to the course, the quality, quantity, and patterns of communication between students and faculty will greatly improve, affecting learning in a positive manner.

ANGEL enables you to create online courses without having to know HTML, web file-naming structure, or server locations. The first step in developing an online ANGEL course is identifying and using the tools in ANGEL to create interactive activities that will engage learners. Focus on activities that replicate the interaction within a classroom. A good jumping-off point is to think about questions your students will ask, and then start to build those questions into your activities through discussion forums, online chats, quizzes, or a wiki. ANGEL has a variety of features that make it seem to the student that


the instructor is always online, providing feedback at all times. Utilizing ANGEL tokens is a great way to provide feedback.






Following is the basic format for the online approach:

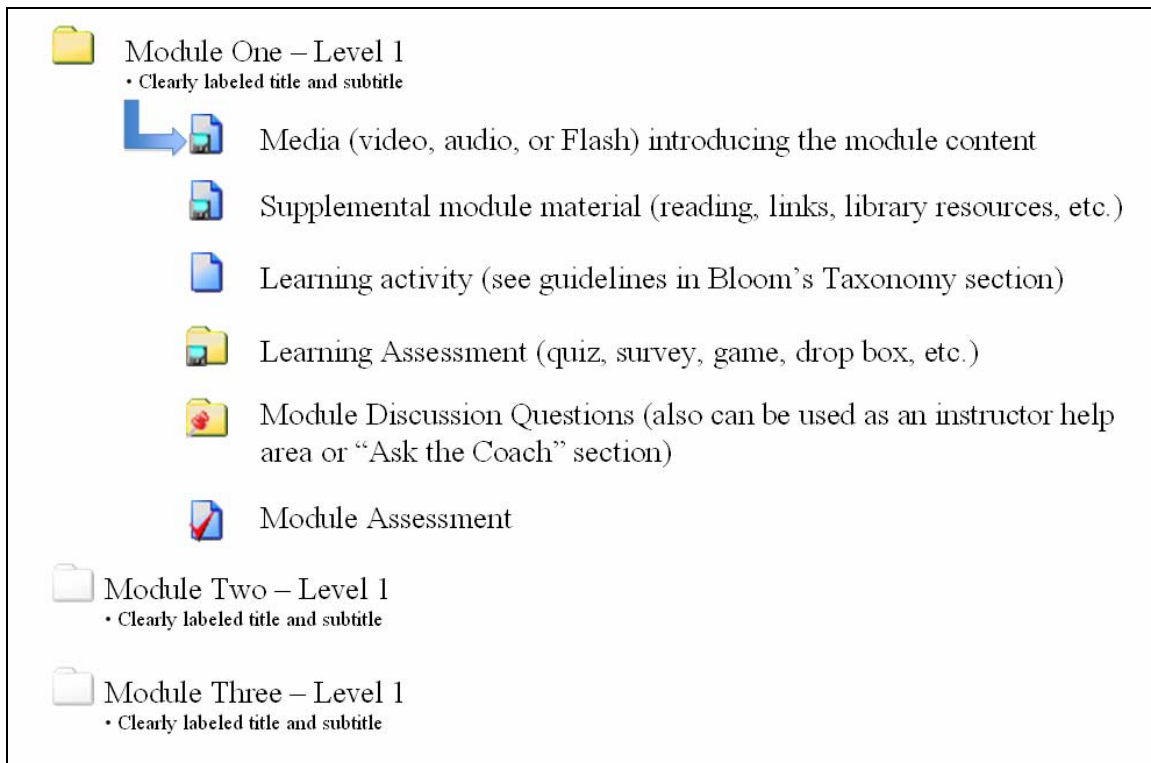
- Explanation of online activity that must be completed for the upcoming class. Give explicit instructions on how to interact with these activities, as they replace the traditional classroom. Activities may consist of movies, discussions, wikis, blog posting, voiceover, PowerPoint slideshows, etc.—even something as simple as a reading.
- Activity assessment. Because learning occurs asynchronously, some form of assessment must be in place to determine the learner's understanding of the concept. This assessment takes the place of a question-and-answer session in a traditional classroom.
- Review of online activities. Collaborate with students to understand any problems they had with the initial material.
- Feedback. This can be as complex as written feedback to each individual student, or as simple as token-driven responses based on quiz percentages.
- Assessment of learning/submission of assignments.

The following images depict the Lessons tab in a linear online ANGEL course. If the course is non-linear or "complete at your own pace," subsequent ANGEL module folders would not be hidden.

The Online Approach – Lessons Tab

 Getting Started – Level 1

-   Welcome Video or Flash Movie
 - This can be a simple Word document if multimedia is not an option
-  Syllabus
-  Course Overview and Learning Goals
-  Introductory Discussion Forum
 - Introduce students to each other
 - Students should be instructed to give relevant background information and explain why they are taking the course



Supplemental Approach

Using ANGEL as a supplement extends the brick-and-mortar classroom to the Internet, allowing the student to expand on the learning opportunities available in the classroom or the textbook. The principal user of the supplemental approach is an instructor who utilizes ANGEL to post materials that can be used during class or for review after class. With this approach, learners do the majority of their learning in the traditional classroom, but can spend time outside of class using online resources to follow up and review.

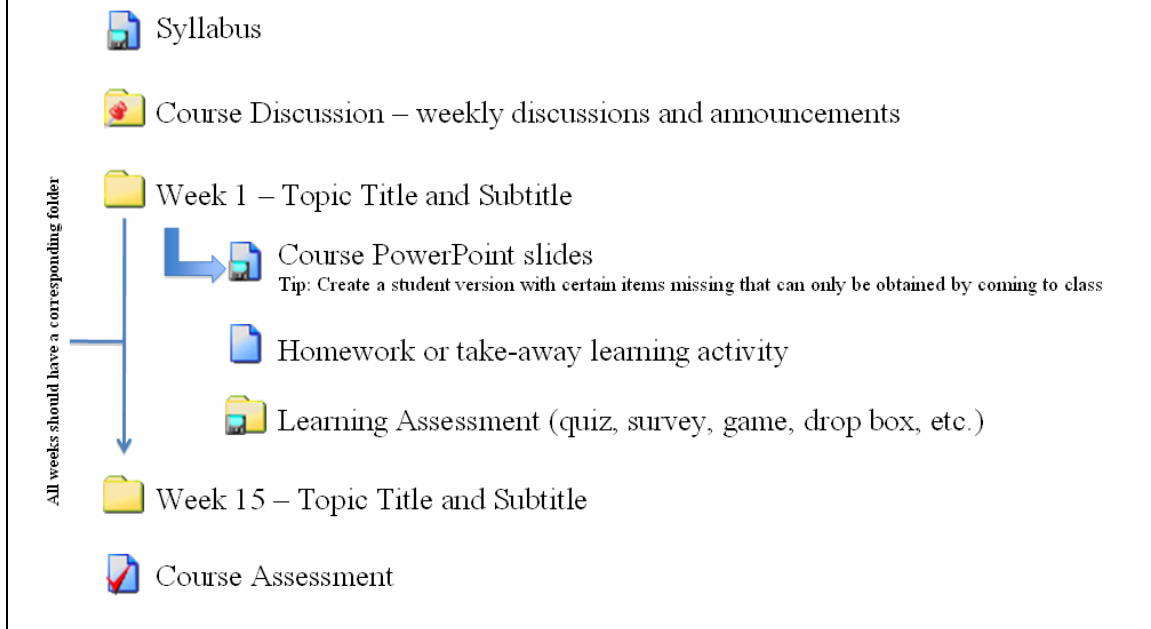
Each learning module should be developed in the Lessons tab, using the Create a Folder feature (see the following figure). The module should be labeled clearly with a title and subtitle that accurately describe the content. Dates should be included in the titles that correspond to classroom learning.

Following is the basic format for the supplemental approach:

- Posting of materials that must be completed for upcoming class. Materials may consist of readings, quizzes, surveys, discussions, and so on.
- Review of in-class activities, usually posted after completion of class.
- Review of material through online discussions, using discussion forums, chat features, or document sharing.
- Assessment of learning/submission of assignments.

Creating a weekly folder with content-driven subfolders yields the best results. Supplemental approach users may use other resources such as the calendar, communications (email), or management tools.

The Supplemental Approach – Lessons Tab



Hybrid Approach

The hybrid approach combines the supplemental and online approaches, merging the best of both into a usable learning environment. The hybrid approach should be used when there's a need for distance education, mixed with classroom learning utilizing ANGEL tools.

Following is the basic format for the hybrid approach:

- Determine whether the assignment or activity would work better in the classroom or online. The decision could be based on goals of the activity, classroom time allocation, or type of tasks to be performed.
- Develop the activity in ANGEL, using the tools that best help learners to meet the educational goals.
- Assess the activity.

Course Organization

ANGEL offers many tools to help you arrange content into instructionally sound modules/lessons. Most course organization takes place in the Lessons tab, using folders to create modules/lessons. Other tools in ANGEL, such as the calendar and course communications, can help you to organize your course through time-released content, immediate student feedback, and interlinking course content.

Modular Organization

The principal user of the modular approach is an instructor whose classroom is primarily online. Learners must be able to complete instructional units within a predetermined schedule. New content is made available upon completion of tasks corresponding with learning objectives.

Each learning module should be developed in the Lessons tab, using the Create a Folder feature. The module should be labeled clearly with title and subtitle, accurately describing the content and learning that will take place. Folders can be set with object variables to unlock forthcoming material, or all material can be made available to students from the beginning of the course.

Following is the basic format for a learning module:

- Learning objectives. Statements describing the key outcome(s) desired from the instruction.
- Instruction. Teaching students what they need to know. This instruction may consist of pages of content, audio or video files, links to external resources, etc.
- Learning object. Task that the learner must complete: reading, case study, debate, online chat, watching a video, and so forth.
- Feedback. Providing timely information about performance and progress. ANGEL includes excellent opportunities to provide feedback through the use of tokens, built-in feedback through quizzes/surveys, or through the comments areas in numerous tools.
- Assessment. Activities to determine whether the student has met the desired learning objectives. Assessment can be accomplished using a variety of ANGEL tools. All assessment depends on the amount of time you have to review, the number of students in the course, and the level of understanding you want learners to achieve. Assessment examples:
 - Written paper submitted through a drop box.
 - Comment posted on a blog.
 - Addition made to a wiki.
 - Quiz/survey.
 - Posting to a discussion forum.
 - Email to the class.
 - Completed game.

When instruction centers around a significant educational objective, learners are more likely to be motivated to complete the task, therefore retaining more information and achieving a higher order of understanding. All objectives are different; some may take only a few minutes to master, whereas others may take days or weeks. The modular approach lets you design your instruction around learning rather than time. The instructor can redesign course material easily, because every module is like a “mini-course.” If you find that a certain topic needs a new activity, reading, or assessment, you can redesign the element without compromising the integrity of the entire course.

Using the modular approach is a great way to make online content more interactive. You can do this by building into each module pieces of instruction that allow for students to interact with the subject matter. Because you base these activities on relevant modular

instructional objectives, students are more likely to see the immediate relevance of the instruction and how each module fits into the bigger course/curriculum structure.

Time-Released Content

Because you do much of the course prep work in ANGEL prior to the start of the course, you can spend more time interacting and working with students during the course. The timed-release capability of the coursework also enables you to structure your course to fit the length of the semester, term, or academic year. Timed-released content gives students goals to achieve and keeps all learners working at the same pace, which is especially important in an online environment where group work is present.

Lesson Content

Learning Objects

In the past, classroom content came in chunks, through hourly lectures or large content blocks. Today, learning objects provide a modular way of structuring learning content, offering the following features:

- Small units of learning, typically ranging from 2–15 minutes.
- Self-contained. Each learning object can be taught independently of the others.
- Reusable. A single learning object may be used in multiple contexts for multiple purposes, which allows for greater flexibility in course development.
- Movable. Learning objects can be moved from module to module, lesson to lesson, or even from one course to another.

By utilizing learning objects, you can create a flexible and scalable curriculum. Most learning objects are part of a learning management system or central repository (Merlot is an example), and thus are tagged with metadata—descriptive information that allows the course to be found easily by a web search.

Controlling Content Access

The ability to limit access to content can be helpful when working with teams in an online, hybrid, or supplemental environment. ANGEL lets you set passwords, lock items to individuals, or limit access to only those enrolled on an ANGEL team. Along with the timed-release measures mentioned earlier, these features greatly enhance the instructor's ability to deliver flexible content to many different student populations in one class. Making educational materials relevant to subgroups of learners is a monumental task, especially in large enrollment sections; the tools in ANGEL simplify that process. By allowing you to make the content accessible to specific learner groups, ANGEL creates an environment that fosters greater analysis and synthesis of information, thus leading to better knowledge retention and better learning.

Folders

Anyone who wants to arrange class material in a sound pedagogical manner can use the ANGEL folder tool. Folders are located under the Add Content link in the Lessons

tab. To create a folder, click the “add a folder” link. Each folder should be labeled properly with a title and subtitle, so that students can determine the contents of the folder easily. To provide specific instructions to students, use the directions area.

When creating material in ANGEL using the folder tool, the instructor is creating the shell for the course. Each folder operates like a mini Lessons tab, allowing the instructor to separate topics into manageable learning objects.

In the early days of web-based learning, instructors were given time to create web-based courses. With the adoption of course management systems and their ease of use, in many cases time to create a course has been greatly reduced. By taking the time to plan course structure incorporating the flexibility of ANGEL, however, you can create a rewarding experience for your students.

Surveys

Most surveys are used for the pre- and post-assessment phases of teaching and learning objectives. Using surveys can help to improve your instruction in a variety of ways. Don't think of the survey tool as simply a means to evaluate your teaching style; ANGEL surveys also can be used to assess learner outcomes, expectations, peer evaluation, opinions/attitudes, and activities.

- Pre/post-assessment of teaching. Instructors can determine students' expectations for the course. Students can provide feedback to the instructor on teaching style. Any information gained in pre/post-assessment can be used to make instructional decisions based on the instructor's strengths and the students' needs. When this type of assessment is used in conjunction with quizzing tools, an instructor can establish a very thorough assessment of the course. Pre/post-assessments are most affective when responses are anonymous.
- Peer evaluation. Students can evaluate fellow classmates, along with group and team members. This allows the instructor to review team dynamics, focus attention on groups with more needs, and determine which groups are ready for more advanced topics. Peer evaluations work best when submitted anonymously, but make sure that strong guidelines are established, so that the evaluations don't become complaining sessions.
- Opinions/attitudes of students. The most common use of surveys. Determining the attitudes/opinions of your students is an integral part of building a curriculum. For students to learn, they must be interested in the activities presented to them. You can survey students on topics such as politics, environmental issues, the stock market, and so on. Once the results are gathered, formulate instruction that best meets the learners' interest. Opinion/attitude surveys can be given anonymously. If given to identified students, on the other hand, those students then can be divided by opinions for certain activities.
- Activities. Not all surveys need to be complex. A simple survey that asks two or three questions on the merits of a classroom activity may garner the most useful information.

Developing good survey questions is an art form. Make sure that your questions are well thought out, and ask students for answers that will help you to improve your instruction. Don't fill the survey with information that students may see as useless.

Simple surveys should contain 10–15 questions, but more complex surveys could be hundreds of questions long. Always allow for open-ended questions, as they gather student information that you may not have considered. Be sure to ask the same question multiple times in different formats to add validity to your question set.

Students receive instruction best when the instruction is of interest to them. The best way to determine student interest is through student-centered survey techniques. You can monitor student needs, wants, and interests, thus enabling you to create better instruction. When surveys are given over longer timeframes (for example, an instructor gives the same survey over a three-year span), trends in student behavior can be analyzed to create superior instruction.

Surveys are powerful instructional tools, but they must not be overused. If too many surveys are given to students, the surveys begin to lose their effectiveness, and the results will be unusable.

Games

Educational games are a highly engaging form of practice and exploration that complements regular classroom or online instruction. Games allow students to enter a different world filled with interesting characters and settings, which enables them to participate in learning activities. Interactive games offer opportunities for high-quality learning in a fun and entertaining environment, along with creating performance-based learning that's motivating and effective. While ANGEL games may not submerge the user in another realm or world, simplistic games allow for students to comprehend information through other means than the traditional quizzing and testing format.

Blogs

A *blog* (short for *weblog*) is a journal that's available on the web. The activity of updating a blog is called *blogging*, and someone who keeps a blog is a *blogger*. Frequently, blogs are updated using software that allows people to post materials to the web without having to know HTML, web architecture, or server location. Postings on a blog are almost always arranged in chronological order, with the most recent additions featured near the top of the page. Simply stated, a blog is a website that you can update easily and contribute to from anywhere you have an Internet connection.

Using a blog as a communication tool in your classroom can increase the amount of offline communication between students and may greatly reduce the number of classroom-related email messages you receive. Students will be more inclined to read your blog postings and provide feedback comments; other students may view this feedback and use it to solve problems on their own, or may contact the originator of a comment for assistance. Blogs help you to publish thoughts, ideas, and assignments, while creating engaging online communities that are simple to update on the web.

Using blogs in the classroom can be a challenging task. There are two basic strategies for implementing blogs in the classroom:

- The instructor blogs, and the students respond to that blog via the comments section.

- All students create blogs, and the instructor subscribes to each, aggregating them with a tool such as Google Reader.

Blogs can be beneficial to learning in three ways:

- Engaging learners in an active online community by using comments or student blogs.
- Easily edited, web-based communication without all the drawbacks of email.
- Simple web editing; knowledge of HTML is not necessary.

Assessments

The principal user of the quizzing tool is an educator who wants to assess the learning of the classroom participants. Quizzes are located under the Add Content link in the Lessons tab. To create one, click the “create a quiz” link. Each quiz should be labeled properly with a title and a subtitle so that students know what to expect from the assessment. To provide specific instructions for students, use the directions area.

Don't think of the quizzing tool as simply a means to evaluate students' learning. Using the quizzing tool can help you to improve your instruction in a variety of ways. The ANGEL quizzes can be used for pre/post-assessment and reading comprehension.

- Pre-assessment. A way to determine what students know about a topic before it's taught. Instructors can use the information gained in pre-assessment to make instructional decisions based on students' strengths and needs. This also helps the instructor to determine which students are ready for more advanced topics.
- Post-assessment. A way to determine whether students have learned the material. Instructors can use this information to prepare instruction for future classes. This information also can be used to determine whether certain material must be reviewed before moving on to more advanced topics, and which students need more help.
- Reading comprehension. A great way to increase discussion and student readiness in your classroom is to develop a quiz that's given in conjunction with a reading assignment. This ensures that students are reading the material and gives the instructor the ability to focus the student's studies. This technique also allows for more in-depth discussion time in the classroom, as students are more prepared for your class.

Note: For sound assessment, test learners on what is taught. The goal of assessment is not to trick or confuse learners, but rather to ensure that the learner is meeting the performance goals set forth for the course.

For each performance objective written for the course, the criteria must specify how well the learner must perform the skill described. As we move students higher up the learning taxonomy, we must test them to see whether their knowledge gain meets the standard set forth. How well are learners progressing through the course, the material, the subject matter?

Most pre-assessment and post-assessment consists of criterion-referenced tests that directly measure a set of behaviors described in the performance objectives. Using the quizzing tool in ANGEL will help you to develop criterion reference tests to evaluate your students' progress, as well as your progress as an instructor.

Pages

Creating a page in ANGEL enables you to add many components to your course. This in turn will make your educational environment more attractive to students and increase their learning capacity. Students today are media-savvy. To make your class interesting to them, you must have content that keeps their attention:

- Image-rich content. Embedding an image that can be tied to an activity is a handy tool for medical, arts, and recognition courses.
- Graphs and charts. Embed pre-made graphs or charts—great for business, math, and economics courses.
- Video. Easily embed video into your pages.
- Text styles. Manipulate the styles and presentation of text on a page.

Most of us are familiar with the Campbell's soup jingle, "Mmm mmm good," or Nike's slogan, "Just do it." Education is a lot like marketing. Perhaps you want students to remember the capital of Pennsylvania just as much as Nike wants you to remember its trademark "swoosh."

Educators don't have multimillion-dollar budgets or fancy Hollywood sets to create commercials, but with ANGEL we have the ability to create pages that can hold rich media. People learn by absorbing information through all their senses: touch, smell, taste, sight, and sound. By creating pages with rich media content, you enable students to absorb information through multiple senses. The more rich the media, the higher the retention, the better the understanding...and life-long learning occurs.

When you create a page in ANGEL, you're simply creating a web-based HTML page by using the built-in page (HTML) editor. The principal user of the page creation tool is an educator who wants to provide an outlet for students to access content full of rich media, delivered online. You don't have to know anything about HTML to use this tool; it's a simple editor that enables you to create and edit content in ANGEL.

Another benefit of using the Add a Page feature is that you can make changes directly to your document in ANGEL, without having to re-upload your file. (Note: Please make sure that you have an archiving process in place, so that none of your materials are lost accidentally.)

Files

The principal user of the Add a File tool is an instructor who wants to share classroom and supplemental material with students, simply as an electronic file accessible through ANGEL.

The Add a File tool lets you add a variety of files, from Excel tables to video clips. Students can review these materials, use them as study aids, or work on assignments. This feature allows you to keep the virtual doors to your classroom open 24/7.

- Excel files. Great for business and math applications.
- Word documents. Deliver supplemental information developed by the instructor.
- PowerPoint slides. Make lectures available in printed format.
- PDF file. Deliver protected material that cannot be edited.
- Audio files. Post lectures or supplemental speaking engagements.

- Video files. Handy for visual activities or lab exercises.

Some people are passive learners who need to read material and analyze it internally. By contrast, active learners need to be presented with a task and physically complete that task to learn. The Add a File tool lets you create a learning environment that is equally appealing to both of these types of learners, as well as reaching learners who need visual or auditory materials.

Wikis

A *wiki* is a website that can be edited by visitors, producing a kind of collaborative site that includes work from many authors. A wiki site allows anyone to edit, delete, or modify the content on the web. In ANGEL, the wiki tool can be used for distance collaboration on student-centered projects; for example, students can create collaborative definitions for terms related to the subject matter. Wikis are a great tool for the development of collaborative papers or projects, allowing the team to write and develop their project, while others watch the thought process unfold through the postings.

Links

The principal user of a link is an educator who wants to expand student learning outside the classroom walls, creating a hyperlink to an external information source for that purpose. If you're linking to a site you don't maintain, make sure that you have permission and that the targeted source is reliable. Periodically check links to make sure that they continue to work.

Creating a link to an external site works the same in ANGEL as in any other web application. You have a variety of options when creating a link. Students can view the website in a parent, new, or blank window:

- Parent. Opens the website in the same window. This is a good technique to use when a student must complete a task and then return to ANGEL.
- New. Opens the website in a new window. This option is best when linking to external sites that contain information a student can use to complete an activity.
- Blank. Opens the window in the ANGEL frame. Best when linking to something internal to the ANGEL system.

Using external links is an innovative way for instructors, educators, and professors to make inroads into the student's digital lifestyle. Students today are used to seeing thousands of images per day. Adjusting our teaching style to their learning style is imperative. No longer is it acceptable to provide students with one source of information on a subject; we must find multiple opinions on a topic and let students decide, learn, and evaluate based on multiple sources.

Drop Boxes

A drop box is an ANGEL feature that allows students to submit assignments electronically. There are many techniques for drop box use:

- Individual assignment drop box. Each assignment has an individual drop box to which students submit the given assignment.

- Team drop box. One team member submits the assignment to the drop box; with a peer review setting, all team members can view the assignment.
- Individual student semester drop box. A drop box is created for each student, and only that student has access. The student submits all assignments to his or her individual drop box.

Tip: All drop boxes can be set up with a deadline; students who don't meet this deadline are unable to submit the assignment. To avoid extra work and a line of students at your door, create a late-submission drop box that opens immediately after the original drop box closes.

The life of a student is more complicated than ever before. Students are asked to maintain higher grade point averages, participate in more associations, and complete more community service. To remain competitive, students must have the opportunity to complete work on their own schedules. The drop box allows students to submit assignments 24/7.

The drop box also allows the instructor to set fixed deadlines that are easily managed. Since every assignment submitted receives a time/date stamp, instructors can track submissions and set parameters for due dates. The instructor can manage the classroom more effectively and efficiently by setting up staggered assignment submissions; reading and grading submissions over a longer time period can produce better feedback. Feedback and grades can be placed in the drop box for students to access.

Discussion Forums

A *discussion forum* is an asynchronous online discussion that allows users to post and reply to comments published by an instructor or other classmates. The principal user of a threaded discussion is an educator who wants to expand student learning/sharing outside the classroom walls. A clear set of forum rules should be posted:

- No obscene or hateful language.
- No solicitations or advertising.
- Post a message to the thread only once.
- All posts are subject to review.
- Report any problems.

These are simply guidelines; check your institution's web policies for rules that you can post in your forum.

When using the traditional discussion feature, keep the following points in mind:

- Everyone can respond to all posts.
- If you have a large class, discussion can jump topics quickly.
- The original post or question must drive the entire activity.

Creating a discussion is easy. Just remember the main rule: Always post an interesting question/problem that will spark discussion among learners.

Discussion forums invite students to participate. When they participate, students stay focused, have more energy, and learn more. The majority of people retain very little

information from a lecture. Our brains are programmed to learn by doing, using all our senses to solve a problem. Creating a discussion allows you to change passive learning (for example, reading a book) into active learning by discussing, commenting, debating, and in turn analyzing and synthesizing the information.

Discussions	Traditional Learning
Active learners	Passive learners
Higher retention	Lower retention
Analyzing, synthesizing, evaluating	Recalling and comprehending
Stimulating	Mind-numbing
Experience with practice	Retention of facts

The most common problem encountered with a discussion forum is that students don't actively post in the space, with most only reading others' replies. The instructor must provide guidance for the activity. As discussed earlier, begin by presenting an intriguing question/problem. Follow that by participating in the development of the instruction. If a student post expresses an idea that's incorrect, step in and redirect learning toward the desired result.

Technique	Rationale
Ask questions to guide student comments and the direction of the discussion.	Open-ended questions are particularly useful in discussion boards, and should be used in lieu of closed-ended questions whenever possible. Play "devil's advocate" by asking probing questions, using contradictions and counterexamples, and challenging students to apply their learning to novel situations, practical scenarios, and prior learning.
Weave student comments into your postings as a means of summarizing and subtly assessing.	Quoting student comments goes a long way toward providing confidence and satisfaction in your students, and spurs more frequent posting.
Use role playing as a means of stimulating discussion.	Because of the reflective nature of the medium, discussion boards are an ideal venue for students to role play different perspectives and vantage points.
Balance and presence are key aspects of a successful discussion board.	Make your presence known in the discussion boards, but don't dominate them or be overwhelming by posting too often. Posting too frequently leads to short discussions and fewer student postings; posting too infrequently leads students to believe that the instructor is disinterested or absent. Encourage student-to-student learning first and foremost on the discussion boards, as a means of enabling students to attribute learning and success to themselves.
In a supplemental role, discussion board activity should relate closely to in-class activities. Draw clear connections between in-class material and online discussions.	Extend in-class discussions to the online venue, asking students to consider alternate perspectives and other criteria that may challenge their assumptions, beliefs, and findings.
Resist the temptation to make declarative statements.	Instead of commenting "That's right!" or "Not exactly" in your responses, pose questions asking students to analyze the context of their perspective, or to project

Technique	Rationale
	their perspective onto a novel situation.
Use multiple short paragraphs instead of one or two long paragraphs in your postings.	Students spend considerably more time reading shorter paragraphs online than they do longer ones, and remember more of the content.
Empower students by allowing them to facilitate discussion forums.	When a student facilitates a discussion board, he feels an increased sense of ownership over his own learning, and the learning of fellow students, becoming more invested in the learning process.

Adapted from "Improving the Use of Discussion Boards," Worcester Polytechnic Institute, <http://www.wpi.edu/Academics/ATC/Collaboratory/Idea/boards.html>.

Course Syndication

The digital world is moving rapidly toward a content-on-delivery system. To achieve this goal, all digital material must be "subscribable." Students live in the world of iTunes and on-demand cable; they want specified information delivered to them. By enabling the course syndication features in ANGEL, users can choose what they want delivered to their profile or web browser, incorporating their learning into their everyday lives.

Conclusion

Throughout the design and development of an ANGEL course, your goal is to create an environment in which instructors can collaborate both synchronously and asynchronously with students to enhance communication in the course, which in turn improves student retention and learning. By designing something that fosters logical collaboration and thought, you may get unexpected outcomes that benefit users.

Through its robust set of tools and communication devices, ANGEL allows people with different epistemologies, cognitive behaviors, and technologies to process equal amounts of information and obtain the maximum benefit in a way that best fits their learning personality. With such a robust, instructionally solid course, a monumental change in learning can also occur: Students focus more on principles, goals, and objectives than on course grades. Without ANGEL's ability to create a community of learners, none of this would have happened.