Designing a Course Through Backward Design

Designing a Course and Constructing a Syllabus
Best Practices in Teaching and Learning

We're going to talk about a particular strategy called backward design that is used to create courses that help students better understand the course material, and gain the ability to transfer their knowledge to new situations. The backward design process can help you deliver a more effective course by minimizing rote memorization, and maximizing transfer of knowledge. In backward design, start with a list of the most important concepts that students should know, be able to do, and understand by the end of the course. This refers to the course learning objectives, or our intended goals for students to achieve by the end of the course.

From here, you can develop the assessment methods that will help you best determine whether students have reached your learning objectives. The assessment tools will comprise the assignments and exams in your course. The last step of the backward design process is to plan the learning experiences and instructional methods that you will use to help your students reach the intended learning objectives. This process of backward course design will help you effectively design a course to enable transfer of knowledge.

Let's go through each of the stages of the backward design process in more detail. The first step of the backward design process is to identify the goals of your course, and then you can design everything after that-- the learning objectives, assessment tasks, and then the instructional experiences. When you're determining the goals of your course, think about your students' skills, knowledge, and attitudes.

In the second step of backward design, determine the acceptable evidence for students having met the desired learning objectives. The assessment that you choose should be performed at both the beginning of and throughout the course. In the third step of backward design, you will design the in-class activities and instructional methods to create the necessary learning experiences to help your students meet your learning objectives.

Before you begin thinking about learning objectives, you must prioritize the content for your course. This exercise will lead into the development of the learning objectives. When prioritizing the content for your course, start with the big ideas and core tasks that you would like your students to have by the end of the course.

Big ideas are the enduring understanding that connects concepts throughout the course. They are the glue that holds everything together. Big ideas are broad and abstract, universal in application, applied to many examples.

When you are planning the course, ask yourself the following questions. First, what understanding about big ideas should students leave with? And second, how do common misconceptions inform your selection of desired understanding?

A big idea can be a word, phrase, sentence, or a question. Examples of big ideas from Wiggins and McTighe, reading are evolution and hunter-gatherer societies. One place to find big ideas are in state or national educational standards. Thinking about the big ideas for your course is very difficult, and may take teaching the course more than once to help you identify the big ideas.

Then, ask yourself about what you would like your students to know and be able to do by the end of the course. This second circle corresponds to your learning objectives, which represent the skills, knowledge, and attitudes that you would like your students to obtain in order to be able to transfer knowledge successfully. Lastly, include content that you would like your students to be familiar with by the end of the course.

For example, this may be the names of historical figures, important dates, or formulas. All of the other content that doesn't fall into one of these three circles probably shouldn't be included in your course. Once the content is

prioritized for your course, as the instructor, you can adjust the assessments and instructional activities appropriately to align with your prioritized content.

Now you'll have a chance to brainstorm the big ideas in your discipline. What are the big ideas within your discipline? If possible, work with at least one other person from a similar discipline, and then share your big ideas on the online course forum? Pause the video here while you complete the activity.

Now that you've had a chance to brainstorm your ideas on your discipline's big ideas, I will share a few example big ideas for several different disciplines. One big idea in physics is energy conservation, meaning that energy is conserved, and is minimized at equilibrium although it is subject to relevant constraints. In biology, evolutionary mechanisms is a big idea. This big idea is about how natural selection produces evolutionary change, and random effects can affect evolutionary history.

In chemistry, the big idea of the relationship between structure and function is about how the structure of molecules determines its function and role. In mathematics, the big idea of divide and conquer can describe integrals and derivatives. When taking the integral or derivative, you utilize small intervals in which hardly any change is observed. Then when taking the integral, you add up neighboring pieces. And while taking the derivative, you divide all of the pieces. In systems, the big idea of feedback loops focuses on the fact that systems interact with other systems via forces, messages, or in general via information or signals.

Even though the big ideas listed here are only listed for one discipline, they are frequently interdisciplinary in nature. For example, the relationship between structure and function is relevant to biology, as well, and that by understanding a protein structure, you can understand its function. In addition, feedback loops are also relevant to biological regulatory networks.

In this activity, you will have the opportunity to prioritize content for a course that you teach or would like to teach. First, work on your own, and identify the underlying concepts in the list of topics that you generated as part of the precession assignment. Then, prioritize the content into the categories of content prioritization-- the big ideas and core tasks, important to know and do, and then the worth being familiar with. Once you prioritize the content for your course, work with one other person to share and refine your content prioritization. Pause the video now to complete the activity.

Now that you've had a chance to complete two activities to brainstorm big ideas and prioritize content, let's have a discussion on the pre-session readings. The pre-session readings were chapters one and two on clarifying content priorities and backward course design in the book titled, Understanding by Design, by Wiggins and McTighe, and the second reading was a resource on Bloom's Taxonomy. What were your reactions to the readings? Do you have any questions about the readings? First, post your reactions and questions on the online course discussion forum; and second, respond to your peers' reactions and questions.