Preparing to Teach – Backward Design

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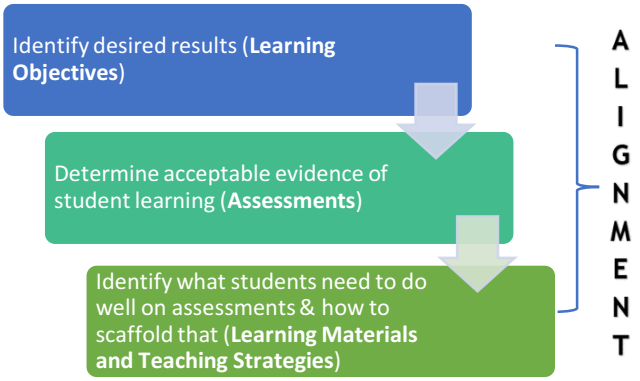
What is Backward Design?

The design of individual class sessions, units and the course as a whole is central to student learning. Behind the most successful learning environments, there is an intentional design. When creating or revising a class or course, instructors typically think of activities they want to do with students, the textbook or tests they can use. While choosing activities can be fun, we want to ensure they are helping students reach a desired outcome and in turn, setting them up for success on assessments. Backward Design does just that and is support by research!

Backward Design is a planning framework in which you start with the end in mind - the desired outcomes. Once you have determined what you want the students to be able to know and do, you'll define how you will know if the student has achieved those outcomes. For example, if you want students to be able to evaluate the strength of an argument, you'll want to assess them not on writing an argument (that could be a different learning objective) but on actually determining the strength of an argument.



Finally, think about how you can best prepare students to be successful on an assessment and achieving the outcomes. This planning involves identifying learning materials, activities for students to complete inside or outside of class, and what teaching strategies you will use. The key element in Backward Design is alignment; activities need to support the learning outcomes and prepare students for successful performance on the assessments, and the assessments must directly align with the outcomes.

Introduction

Backward Design was described by Wiggins, Grant and McTighe (1998) in an attempt to redirect instructors' focus from activities and instruction to the *outcomes of instruction*. This helps to address the misconception that the activity itself always leads directly to the desired learning, when, in fact, the activity may just start the process of engagement, curiosity, or understanding.

No matter how many times you have led your class, there are always seemingly small tweaks, edits and changes that you can make. This may be prompted by feeling lukewarm about how an activity went, how students performed on an assessment, feedback from students, or even just changes in your students or course. Backward design is a part of this process of enhancing your teaching.

Implementation

1) Identify and write learning objectives: Learning objectives can be related to knowledge (content), behaviors, and skills. They can also be complex as long as the support for achieving them is broken into smaller steps.
    a. What types of learning do you want your students to achieve (lower or higher order thinking)? Do you want your students to remember something, be able to apply it or create something new? Check out Bloom's Taxonomy and some associated verbs to help write learning objectives.
        i. "Students will be able to…."
        ii. Avoid using ambiguous words like understand, learn and know.
    b. Be sure that these learning objectives align with expectations/guidelines/protocols for your discipline, institution or accrediting body.
    c. Prioritize learning outcomes that are essential. Many times, instructors need to remove some learning objectives that are less essential (even when they are favorite topics of the instructor) than others to ensure long-lasting understanding related to the course's major themes.
    d. See the Resources section for more information regarding writing effective learning objectives.
2) Determine what evidence would demonstrate that a student has met each learning objective.
    a. Many times this translates into an assessment of their knowledge, behavior, or skill.
        i. This could mean students are able to answer questions correctly on a multiple choice test, be able to describe a process during class, on an open-ended assignment, complete a project or perform a certain skill.
    b. Aligning the assessments with the learning objectives is key. For example: A multiple choice question related to cellular aging is insufficient to assess whether students are able to *explain* the mechanisms of cellular aging. Evidence supporting an ability to explain could be an essay explaining the mechanisms of cellular aging or a diagram with descriptions of the various processes of cellular aging. On the other hand, a multiple choice question would be able to determine if a student recalls the proteins associated with cellular aging.
3) Design the learning materials, activities and teaching strategies that are necessary to help students achieve those objectives.
    a. Questions to ask yourself:
        i. What learning materials are necessary?
        ii. What teaching strategies might work best for each objective?
        iii. How can I foster a productive learning environment?
    b. Determine when and how topics and activities are completed. There will be fewer emails and frustrated students if "hard parts" are addressed in class where as simpler things are addressed outside of class.
        i. For example, if you would like your students to be able to write a critical analysis of a report on X, you'll need to prepare activities where they practice writing, identify elements of effective critical analysis, apply those elements and practice communicating analysis of other papers.

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Frequently Asked Questions

a) *All of this sounds like I am just teaching to the test, why should I do that*? To be successful, students need to practice learning skills. Expecting students to be able to recall basic information and then apply that to a problem, or scenario without practice and feedback first is a bit like teaching someone to parallel park a compact car in class and then expecting them to do the same with a 24 foot RV on the driving test. So yes, you are teaching to the test by giving the students the SKILLS practice they need, but you are NOT testing them with an exact replica of prior work.

b) *What is the difference between learning objectives and learning outcomes or goals?* Some people do use these words interchangeably. Most would agree that goals and outcomes are usually referring to the same thing; long-term, broad and achievable but not necessarily measurable. Learning objectives refer to specific, achievable and measurable items that can be associated with a specific lesson or an entire course.

c) *I can't seem to write an assessment for my learning objective…* It is often the case that if you are having trouble writing an assessment that aligns with a learning objective, you might consider revising the learning objective. Sometimes the learning objective was written more like a learning activity (students will write a paper on X or pass an exam). Other times, verbiage chosen is rather lofty and not easy to measure; examples include "demonstrate appreciation", "obtain a working knowledge of…", "and grasp the significance"," develop a critical awareness". Ask yourself what would students do differently if they understand or appreciate something and write the learning objective reflecting what they will be able to do. Refer to the Blooms Taxonomy handout linked to this document, it provides different verbs to articulate what students are able to do.

d) *I am finding that my learning objectives are my assessments, is that okay?* Well written learning objectives are assessable, but that doesn't mean the assessment question has to be written exactly as the objective states. Example: "Students will be able to recognize the bones in the hand", could be assessed by asking students to label the bones in the hand on an assessment or through an oral practical in which the student verbally correctly identifies the bones in the hand when prompted. Example 2: "Students will be able to compare and contrast theory X & Y", could be assessed with a case study in which students are asked which theory, X or Y, should be used to evaluate the scenario and why one is a better fit than the other.

e) *Students have always loved my activities, they align with my newly revised learning objectives but grades aren't reflecting their achievement. What's wrong?* There could be a number of places there is a disconnect. Many times, what looks good on paper is not implemented in a way that reinforces the connection between the learning objective. For example, a role-play about the civil war was planned to support students need to identify the causes and effects of the civil war. Unless there are deliberate attempts to guide the role play to include discussion on the influences of the civil war, the role-play may seem like just a fun activity for students and miss it's alignment with the learning objective. The connection with the learning objective may be also lost without a reflection prompt for students following the activity.

    a. Aligned example A: Students are expected to be able to discuss five benefits of multivitamins on heart health. An activity to support their learning may be during a discussion, students share their ideas on benefits of a multivitamin. The activity would

then have continued discussion regarding the benefits directly related to heart health followed by a reflection activity or quiz where students identified which benefits related to heart health.

f) *I think my objectives are well written and everything aligns but how do I know?* You can review some of the resources provided in this document and ask yourself the questions suggested. Don't hesitate to ask someone else to review your learning objectives, assessment and activities. This fresh perspective can help bring to light if there is misalignment or an activity that doesn't seem to fit. Note, sometimes everything may look aligned on paper but after grading exams, it is clear a connection is missing. Reflection and revision is always good practice.

Resources & References

Wiggins, Grant, and McTighe, Jay. (1998). Backward Design. In Understanding by Design (pp. 13-34).

- What is Backward Design? https://www.fitnyc.edu/files/pdfs/Backward_design.pdf

Backward Design resource with video describing process & common situation (fun activities may not have clear connections with learning goals or be best for student learning): https://courses.dcs.wisc.edu/design-teaching/PlanDesign_Fall2016/2-Online-Course-Design/2_Learning-Objectives-Alignment/5_objectives_strategies.html

Center for the Integration of Research, Teaching & Learning Short Videos from Open Course

- Introduction to Backwards Design: https://www.youtube.com/watch?v=UUSojE3Gcto
- Aligning Objectives & Assessments: https://www.youtube.com/watch?v=uzP7sXEHTUo
- Using Backward Design in Your Course: https://www.youtube.com/watch?v=m7od4L9o5L4

Vanderbilt's Understanding by Design Website: Overview, Benefits of Using Backward Design, Three Stages of Backward Design & Backward Design Template
https://cft.vanderbilt.edu/guides-sub-pages/understanding-by-design/

Planning a Class with Backward Design: The Chronicle of Higher Education Article
https://www.chronicle.com/blogs/profhacker/planning-a-class-with-backward-design/33625

Ohio Department Of Education Backward Design Resource:
http://education.ohio.gov/Topics/Learning-in-Ohio/Foreign-Language/World-Languages-Model-Curriculum/World-Languages-Model-Curriculum-Framework/Instructional-Strategies/Backward-Design

Writing Learning Objectives Resources

Using Bloom's Taxonomy to Write Effective Learning Objectives: https://tips.uark.edu/using-blooms-taxonomy/

- Before and after revision examples of learning objectives: https://tips.uark.edu/learning-objectives-before-and-after-examples/

Tips for Improving your Learning Objectives (easy as ABCD): https://www.missouristate.edu/fctl/how-to-improve-learning-objectives.htm

Guidelines for writing effective learning objectives:
https://canvas.instructure.com/courses/803402/pages/guidelines-for-writing-effective-learning-objectives

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