

TEACHING TIPS

INSTRUCTORS' GUIDE TO COURSE DESIGN: LEARNING OUTCOMES & CONSTRUCTIVE ALIGNMENT

INTRODUCTION TO COURSE DESIGN

In this handbook, we will work with the constructive alignment method of course design (Biggs, 2012; Biggs and Tang, 2011). Using this method means instructors are asked to align four primary elements of a course: Learning Outcomes, Assessments, Teaching & Learning Activities, and Content. In addition, instructors are asked to consider the appropriateness of these elements in relation to the learners in their class and where their class fits in to their larger departmental degree requirements. We will cover each of these ideas in detail in later portions of the handbook. Here, we will give a quick overview of constructive alignment.

The main impetus for the use of constructive alignment is the idea that instructors should be able to explain the purpose of everything they do or ask students to do. This helps to make the structure and rationale of a course clear to students and aids transparency. In this method of course design, course level learning outcomes drive instructors' choices of teaching methods and assessment strategies. This way, they are not teaching one topic, assessing another, and expecting students to develop skills or knowledge on something else.

Student Needs

As an instructor, your primary role is to support the learning needs of your students (e.g. ensure they learn transferable skills that prepare them for future courses or careers). For this reason, you might want to consider who they are and what they require to succeed in the course. Consider collecting information via a poll, survey or questionnaire at the start of the course. As you design your course, and throughout the term, ask yourself these questions:

- Who are my students?
- What skills/knowledge they need to learn?
- How can they demonstrate these skills/knowledge?
- Am I giving them the opportunity to learn these skills/knowledge?
- Am I testing them on what I expect them to learn?

Once you have considered student needs, begin by writing learning outcomes that are appropriate for the students in your class.

DEFINING COURSE-LEVEL LEARNING OUTCOMES

What is a Learning Outcome?

Most simply, a learning outcome is a statement that describes the abilities, knowledge, and skills students can expect to develop in your course. It is a way of saying to students, "I designed the lessons and activities in this course to help you develop these skills or bodies of knowledge. If you do the work and take the feedback into account, you will become more practiced at these things. To pass this class, you have to illustrate that you have developed these skills." For each class you teach, you will want to come up with **4-6 learning outcomes that summarize the overarching expectations** you have of

students. You probably already have learning outcomes for your class, but may not have ever written them down before. So why write these down now?

Why Write and Share Learning Outcomes?

There are many reasons to write and share learning outcomes with students. First, to explicitly articulate your learning outcomes might give you a clearer sense of what holds your course together. Second, it is helpful to communicate with your students about what you expect of them – this is fair to them, helps you avoid misunderstandings, and gives a shared reference point should problems arise. Third, it helps to set a (high) minimum standard students should work to meet or exceed. Finally, it allows you to ensure your course activities, assessments, and content are aligned in a coherent way. In a sense, Learning Outcomes are the thesis statements of course design!

How do I Decide on Course-Level Learning Outcomes?

To decide on your course-level learning outcomes, consider these five questions:

1. At which step in each domain of learning (see p. 6) can I reasonably expect students in this class to perform?
2. How much and what can I expect students to learn in my class?
3. Can I have these expectations of all students who are can register for this class regardless of background knowledge, cultural background, or other variable characteristics?
4. What are the absolute most important things students must demonstrate to get a passing grade in my class? (these are your course learning outcomes)
5. Would I pass a student who is unable to meet one of these learning outcomes? (if yes, revise that learning outcome)

So, how do you write a learning outcome? The next section of this booklet has a handy formula you can follow for writing learning outcomes.

Steps to Writing a Learning Outcome

Choose appropriate domain and level in hierarchy (pp. 6-7)

1. Start with stem (see below)
2. Add appropriate action verb to stem (pp. 6-7)
3. Add specific content/value/attitude/ behavior
4. Assess learning outcome (p. 9)
5. Revise as necessary

Learning Outcome Formula

Learning Outcome = stem + **action verb*** + content/skill/value

Examples of Stems;

[By the end of this class, students will be able to](#)
[By the end of this class, students should be able to](#)
[By the end of this class, successful students should be able to](#)
[In order to pass this course, students must demonstrate the ability to](#)

Examples of Action Verbs:

1. **Distinguish*** between Bloom's domains of learning.
2. **Apply*** Bloom's taxonomy to write a course-level learning outcome.
3. **Assess*** course learning outcomes against degree level expectations.
4. **Design*** learning activities appropriate for meeting learning outcomes.
5. **Develop*** methods to evaluate student achievement of learning outcomes.

6. **Integrate*** learning outcomes into all courses taught.

Bloom’s Domains & Hierarchy of Learning

What are Bloom’s domains of learning?

Benjamin Bloom was an educational psychologist. Along with others in his lab, he spent a lot of time studying processes of human learning. Based on work that began in approximately a decade earlier, Bloom and Krathwal (1956) published their first book outlining a system for classifying various levels of intellectual learning. This book continues to be highly influential – even if revised – within educational theory. According to Bloom and Krathwal (1956) learning that takes place in the cognitive (knowledge) domain, begins at the basic level of remembering factual knowledge. As learning becomes deeper, learners move through comprehension, application, analysis, synthesis, and evaluation.

Based on this and later research, educational scholars now outline three domains of learning in which humans regularly engage: cognitive (knowledge), affective (attitudes), and psychomotor (physical skills). Within each of these domains, learners begin at a basic level and move through a hierarchy of types of learning (see table below).

Overview of Bloom’s Domains of Learning

Deeper Learning



Surface Learning

COGNITIVE	PSYCHOMOTOR	AFFECTIVE
Creating Evaluating Analyzing Applying Understanding Remembering	Coaching Applying Recognizing Standards Modeling Observing	Characterizing Organizing Values Responding Receiving

Action Verbs: Cognitive Domain Learning Outcomes

Skill	Description	Verbs
Creating	combine elements to develop new models/ideas	assemble, build, create, construct, design, develop, formulate, generate, hypothesize, invent, modify

Skill	Description	Verbs
Evaluating	assess effectiveness, coherence, rationale and make strategic judgments	appraise, assess, choose, compare, conclude, critique, defend, explain, justify, review, recommend, support
Analyzing	identify assumptions, key components, & internal relationships; infer main principles; structure information	break down, catalogue, compare, contrast, correlate, deconstruct, differentiate, dissect, extrapolate, infer, investigate, outline, separate
Applying	apply or relate information to new contexts	change, construct, demonstrate, discover, execute, extrapolate, implement, manipulate, show, relate
Understanding	know meaning of, and interpret or translate, information	critique, convert, describe, discuss, estimate, explain, interpret, infer, paraphrase, summarize, translate,
Remembering	recognize or recall facts, details, and information	define, identify, label, list, match, recall, recite, recognize, state

Action Verbs: Psychomotor Domain Learning Outcomes

Skill	Description	Verbs
Coaching	Provide instructions to others to perform task	assess, assist, correct, demonstrate, illustrate, instruct, manage, specify
Applying	Apply criteria with no instruction to perform task and evaluate performance in new contexts	adapt, assess, build, calibrate, coordinate, design, infer, manipulate, modify, produce, solve, test
Developing standards	Identify criteria for optimal task performance	compose, distinguish, formulate, integrate, judge, perceive, select, synthesize
Modeling	Reproduce task based on instruction or memory	copy, follow, execute, mimic, recreate, reenact, repeat, reproduce
Observing	Use sensory cues to guide or define appropriate action	choose, copy, detect, follow, identify, observe, relate, replicate, repeat, adhere

Action Verbs: Affective Domain Learning Outcomes

Skill	Description	Verb
Characterizing	Integrates and behaves in line with values in new contexts	act, display, embody, habituate, influence, plan, practice, propose, represent, solve, validate, verify
Organizing	Prioritizes values and resolves internal/personal conflict	alter, adjust, arrange, compare, develop, generalize, integrate, modify, order, reconcile, rank, revise

Skill	Description	Verb
Valuing	Displays attachment, involvement, or commitment in class context/assignments	adapt, argue, balance, challenge, critique, confront, differentiate, defend, influence, initiate, invite, justify, persuade, seek
Responding	Change behavior to reflect attitude; actively react to or participate in new attitude	answer, behave, clarify, comply, cooperate, discuss, examine, explain, model, practice, present, recite, report, show, summarize
Receiving	Become aware of attitude and open to potential value	acknowledge, accept, ask, attend, describe, observe, read, recognize

Worksheet: Write Course-Level Learning Outcomes

Recall the formula → LO = stem + **action verb*** + content/skill/value

Use the above LO Formula to write four to six course-level learning outcomes:

Write your stem:

Action verb*	Content/skill/value

Action verb*	Content/skill/value

Evaluating Your Written Learning Outcomes

You can use the checklist below to evaluate your learning outcomes

- Specific skill/value/content
- Measurable and/or demonstrable
- Attainable by students at current level
- Relevant for students, course, program, degree
- Timed Appropriately for class length

In cases where a learning outcome does not meet the above criteria, you may want to revise it.

SELECTING, DESIGNING AND ALIGNING ASSESSMENTS

Assessment is an important component of any course design process. When you begin considering the types of assessment methods you will utilize in your course remember that although assessments are used for assigning grades, one of the main role of an assessment in course design is to check whether or not a student has met a learning outcome. Education scholars tend to divide assessment into two types: formative and summative.

Formative Assessment

Also known as assessment for learning, formative assessment provides feedback to students about their performance, including their comprehension and application of course content. When you use formative assessments in our classes, aim to correct misunderstandings or mistakes before they become deeply rooted. Although some educators assign some grades for formative assessments, these tasks do not have to be graded. For instance, you may choose to use classroom discussion as a formative assessment to diagnose students' weaknesses and strengths and identify concepts for review. It gives students the chance to practice their skills in a low-stakes context where they know they will receive feedback on how to improve.

Summative Assessment

Summative assessment is referred to as assessment of learning. Final exams are the most commonly used summative assessment. The aim is to measure the learning of a skill or content, assign grades, and ensure readiness to progress with further study. When used throughout the term, summative assessment can identify areas students may need to review or where faculty may need to further flesh out their explanations or try a new method of teaching. Although we recommend starting out by considering the most ideal assessments to use in your class, resource implications may require making certain adjustments. For example, you need to consider any departmental policies (e.g. site visits require waiver forms), the amount of time you have available, TA hours, and your own and TAs' comfort level with this type of assessment.

Examples of Assessment Methods

Although this list is not comprehensive, it provides you with some ideas about a variety of assessments you can use in your class. Ideally, you want to include a small variety of different types of assessments. This helps to ensure that a diverse number of students (1) have the opportunity to illustrate one of their strengths and (2) practice and receive feedback on at least one area for improvement. You might also want to make some of your assessments formative and others summative.

- Research project
- Presentation (individual or group)
- Essay outline
- Essay (different types)
- Mid-Term / Final exam
- Reflexive Journal/Blog
- Quiz (on-line or in-class)
- Reading analysis
- Question creation
- (Community-based) Experiential project/assignment
- Website / wiki update
- Poster
- (YouTube) Video creation
- Edit a classmate’s paper
- Reading responses
- In-class discussion
- Literature review
- Annotated bibliography
- Adopt a persona
- Classroom or online debate
- Interview
- Article/film/book review
- Follow and journal about policy issue or legislation
- Science in the news

Worksheet: Selecting and Aligning Assessments

On the worksheet below, identify up to nine possible assessment methods. For each method, identify at least one learning outcome it measures, potential problems with using this method in your class, and any necessary adjustments you might make to overcome these problems.

Possible Assessments	Aligned Learning Outcome(s)	Potential Problems	Necessary Adjustments

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A Note on Multiple-Choice Testing

Sometimes multiple-choice tests are the ideal assessment to use – either due to the nature of the topic or to the size of the class. Multiple-choice tests that come with a textbook may require additional editing. Often, these test questions may be written by subject experts who have not been trained in writing multiple-choice items and simply replicate poorly designed tests they took as students. All multiple-choice questions have one stem, one correct answer, and two or three distractors – current research suggests three or four options is ideal. For the most effective multiple-choice questions the stem should be longer than the answer options and the distractors should be realistic. It is much easier to write these as you go. For instance at the end of each class/reading, try to come up with four or five viable multiple choice questions you can later choose from. This will help to ensure that the questions you have in your master test question bank reflect a range of course material. Finally, try to remember that multiple choice questions can be used in a variety of ways. For example, you can describe a scenario and ask several questions about it that test students’ ability to analyze the situation from more than one theoretical perspective. Remember that we can help you if you have trouble coming up with multiple-choice questions for your class.

TEACHING AND LEARNING ACTIVITIES

Teaching and learning activities may overlap a bit with your ungraded formative assessments. Lecture time is best used both to impart new knowledge and to give students the opportunity to check their apprehension or apply their newly gained understanding. In other words, we recommend thinking of your lectures as lessons. This will help to ensure that you are not up in front of the class worried about trying to fill in 60-180 minutes with words – something which can be draining and sometimes nerve-racking. Along with a brief intro to a topic/concept, try to include some activities both during class time and in tutorials.

The main thing to remember is that the teaching and learning activities you choose should aim to prepare students to meet the learning outcomes you have set out for the course (and any sub-specific outcomes or guiding questions for the specific lesson during which they are used). Below, we provide a few examples of teaching and learning activities you can use in your class and provide one (not exhaustive) model for how to bring these into your lesson planning.

Examples of Teaching and Learning Activities

You can use a variety of teaching and learning activities. Here are a few suggestions

- Think / Ink / Pair / Share
- Peer instruction
- Reflexive writing
- Guided analysis of video/article/blog
- Question creation
- Clickers
- Large group discussions
- Small group discussions
- Debate
- One minute paper
- Jigsaw
- Worksheet
- Note comparison
- cuLearn discussion posts

- Games
- Peer assessment
- In-class writing exercises
- Group work
- Problem based learning
- Reading responses
- Weekly reflections
- Online activities (e.g. scavenger hunt through different websites)
- Lecture

Lesson Planning

Planning lessons in advance may help with your confidence level and allow you to map out how each class fits into, and prepares students to meet, the overall course learning outcomes. Using a consistent lesson plan template to design your classes also gives a sense of consistency across the course – and lets students know that lectures will always include activities to help them build the necessary skills to succeed in your course and in their program. In addition, following a similar outline across your classes will cut down your prep time.

Before you begin planning your lesson, consider the most important skills and/or content for students to take away from this particular class. Once you identify them, outline the relationships between these key take-aways, the remainder of the course content, and the course-level learning outcomes. Remember that rushing through class to present every last bit of material to students may overload them and encourage surface learning methods. Instead, consider identifying difficult concepts to focus on during class time and encouraging students to apply, analyze, or create with these concepts. Following these steps is one avenue to create a **pedagogy-driven** lesson where the focus is for students to actively engage with the material.

According to current research effective lectures share three characteristics. They are well-organized, focused on SMART Learning Outcomes, and interactive. In a **well-organized** lesson, instructors (1) clarify links between materials, (2) explicitly identify transitions between topics, (3) relate all material and activities to student learning, and (4) provide manageable amounts of information for the time limit. In a lesson driven by **SMART learning outcomes**, instructors structure class around class-specific learning outcomes. These are written using the same technique as course-level learning outcomes, but focus on what will be accomplished in a smaller time slot. Finally, **interactive lessons** encourage active learning, give students a chance to illustrate learning, allow time for questions, and confirm comprehension of material. In other words, pedagogy-driven lessons include teaching and learning activities during class time. The CLAASS model of lesson planning is one way to ensure your lesson meets these criteria.

CLAASS Model of Lesson Planning

The CLAASS model is a way of putting interactive teaching/learning into practice. It is a teaching model that allows you to plan lessons on the basis of sound pedagogical theory. For example, one element in the CLAASS model is the inclusion of a pre-test as a way for the instructor to gauge students' shared previous knowledge in order to identify a shared starting point for the lesson. CLAASS is an acronym: Capture; Lead; Assess; Activate; Solidify; Summarize. The lesson plan gives you a way to break up your class into segments. If you try to speak for 60-90 minutes, you will be exhausted and students may have a hard time taking it in. You can use the model to plan each portion of a 90-minute class. Follow the guidelines below to make sure you give students opportunities to speak, present material, ask questions, or apply concepts. In the table below, each element of CLAASS is defined, an example provided, and a place given where you can plan your next lesson.

Worksheet: Lesson-Planning Table

	Your Description
<p>Capture their attention Lead into the lesson in a way that sets the tone for the next hour:</p> <ul style="list-style-type: none">• Tell a story• Ask a provocative question• Present a challenge• Share a current news item• Show a short video• Review a concept from last class and explain how it relates to today's lesson	
<p>Lead through the outcome Share day's learning outcome(s) or guiding question(s) with students to give them the big picture for the day.</p>	
<p>Assess previous knowledge Find out what (some) students may already know about the topic. You can use this as a base to gauge a shared starting point. It is a way to involve students and lead them from the familiar to the unfamiliar.</p>	
<p>Activate new knowledge Present a manageable amount of information at a time (one concept/idea). Make sure material is logically organized, clarify links to previous or upcoming material, identify transitions, and use questions to get students speaking.</p>	
<p>Solidify with assessment You can motivate students through engaging activities. In this portion of the class, give students the chance to apply what you have just explained. There are many ways to evaluate whether the learning outcome and content have been understood. You can use individual or group activities. It can be written work or accomplished through a discussion. Making sure they have learned this material will help prepare them for the next lesson.</p>	
<p>Summarize Summarize the key points of the lesson in an engaging way. Connect the lesson with what</p>	

	Your Description
comes next and leave them with a question for the next class.	

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