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# CONTENTS

Confidence, Clarity, and Concern: Developing an Effective Teaching Persona .....	5
Stop Blaming Students! Why We Must Teach Students, Not Content .....	9
Engaging the Snapchat Generation .....	15
Bridging Technology and Pedagogy with an Online Teaching Faculty Toolkit .....	18
Systems Thinking: A Framework for Critical Thinking and Active Learning .....	25
Improving the Quality of Machine-Gradable Questions .....	33
Using a Data-Driven Approach to Write Better Exams.....	41
Community in 2021: Giving, Gathering, and Engaging.....	50
About the Contributors.....	53

# Confidence, Clarity, and Concern: Developing an Effective Teaching Persona

Jennifer H. Waldeck, Zac Johnson, and Sara LaBelle

Critical to an instructor's ability to confidently, clearly, and effectively communicate with students is an understanding of the truism that communication begins with the self (Watzlawick et al., 1967). To engage in productive interactions that result in student learning, we must be broadly but simultaneously acutely aware of ourselves and how we want our students to view us generally and in specific situations common to our work. Some instructors are strategic and goal-directed in terms of how they wish their students to perceive them—testing various personas to determine the type of teacher they want to be. Others may give little thought to the nature of their communication with students, relying instead on their content expertise or pedagogical strategies to promote student learning. The latter approach may not serve the instructional process well, as extensive research suggests that our relationships and communication with students play a central role in their learning. An exclusive focus on expertise and pedagogical frameworks is shortsighted since it ignores the importance of communication to teaching and learning.

In *The Art of Teaching*, Parini (2005) introduced the concept of the *teaching persona*, writing that one's teaching identity is often discovered by using pretenses or disguises to determine what best serves a teacher's goals: "Most of the successful teachers I know have been deeply aware that their self-presentation involves . . . the donning of a mask" (p. 58), and "a beginning teacher will have to try on countless masks before finding one that fits, seems appropriate, that works to organize and embody a teaching voice" (p. 59). The idea of teaching personas, and how they contribute to our ability to have a positive impact on students and their learning, is an interesting one that Jennifer explored with 2020 Teaching Professor Conference participants as an extension of our research team's work. This brief article summarizes the concept and will guide readers through the process of identifying an authentic, flexible teaching persona that reflects their beliefs and assumptions about teaching—and learning how to communicate in ways consistent with that identity.

## Identifying one's teaching persona

Essentially, we construct our teaching personas based on how we answer the question "Who am I as an instructor; who do I want to be?" Some archetypal teaching personas include "the serious scholar," "the buddy," "the nurturer," "the helper," "the rebel," "the strict one," "the social justice warrior," "the intellectual elitist," and "the fun one." Think about your closest colleagues. What labels would you use to define the identities

that they portray in their interactions with students and with their colleagues? Now, what about yourself? If students were asked to label you as a teacher, what would you want them to say? You probably have a general belief about who you want to be as a teacher, but you should be realizing at this point that it's difficult to maintain that "face" in *all* instances with your students. For example, the "buddy" who strives to relate to students in positive, prosocial ways and eliminate power differentials in the classroom is required to adjust that approach when discipline or a difficult conversation is in order. Thus, although social scientists have found evidence (Mottet & Beebe, 2016; Waldeck et al., 2019) that one's teaching persona is a fairly stable and consistent presentation of who we want to be in the classroom, a competent instructional communicator will display versatility in how they present themselves in interactions with students.

Authenticity is key to all of our work with students, but a completely stable teaching identity is an impossible goal. Nor would this kind of robotic approach to our work be effective. Linda Shadiow and Maryellen Weimer (2015) noted that, in contrast to Parini's

*"How do you want your students to view you, think about you, and label you? Why? What are your motives for wanting to be perceived this way?"*

contention that personas are a type of "mask," they can be strategic and planned but authentic at the same time. The mask metaphor encourages teachers to be inauthentic and to conceal their identities rather than expose them—to the detriment of student learning.

Earlier we noted that different instructional situations call for the enactment of different teaching identities. In addition,

although more research is needed to illuminate the transitions that college instructors experience (by design or as a result of unexpected external forces) over the span of their careers, we believe that at various points, instructors may enact a new and different primary persona. Less experienced teachers face a difficult balancing act of goals and concerns—wanting to develop rapport and connection with students and being seen as credible experts despite a lack of experience or age, for example. Newer instructors may still grapple with the question, "Who am I, who do I want to be, and how do I want to be seen by my students?" and try out different identities that reflect their sometimes competing goals until they find one that feels comfortable, or, in other words, establish their identity. Over time, we may simply become different teachers, with different goals and concerns. For example, the senior tenured professor may feel free to experiment with innovative teaching methods, have more time to spend informally with their students, and worry less about student evaluations than new tenure-track instructors—leading to a new answer to the "Who do I want to be?" question.

The literature reflects a great deal of speculation about what teaching personas are most common. In 2019, we conducted the first empirical study that asked instructors a variety of questions related to their teaching identities and related goals, and identified three primary personas. First, the *caring* instructor is one who prioritizes compassion, support, and openness in their interactions with students. Second, the *knowledgeable* instructor makes a point of demonstrating expertise and competence. This type of teacher places their primary emphasis on the hard work and heavy lifting of learning, cognitive growth, and an impassioned approach to the subject. Finally, the *professional* instructor wishes to be seen as rigorous, tough, and unflinching. Firm but fair, the professional instructor emphasizes equity, ethics, and high standards.

Take a moment now to reflect and write about who you want to be as a teacher, and why. Use these questions as prompts: (1) How do you want your students to view you, think about you, and label you? Why? What are your motives for wanting to be perceived this way? (2) How do you want your colleagues to perceive you? And again, why? Thinking through both sets of relationships, those with students and those with colleagues, will help you to construct an integrated, holistic approach to strategically enacting the self-presentation behaviors that portray you as a professional.

### **“I know who I am and how I want others to view me, so what now?”**

Competent communicators are distinguished from less effective ones by their ability to select from a repertoire of strategies—a sort of tool kit—and their motivation to select the right tools for the task at hand. So simply knowing how you want others to perceive you in your professional role, generally or in specific situations, is not enough. You must also analyze the behaviors that will allow others to understand you in the manner you intend. For example, consider how you dress, the nonverbal communication and language you rely on, the degree to which you are available and accessible to students (including online), and the media and technologies you are willing to learn and use to communicate with students as they prefer and are accustomed to outside of the educational setting. Claire Major (2015) further discusses personal characteristics such as age, height, and weight as factors that may contribute to or distract from our desired personas.

Another important self-presentation strategy is how you establish credibility with your students. Remember that credibility is much more than your expertise or knowledge. It also pertains to how you build trust with your students and communicate to them that you care about their learning. And finally, the instructional communication literature suggests that to authentically communicate who you are and who you want to be for your students, you must balance the dialectical tension between building prosocial relationships and rapport with your students and emphasizing course content and cognitive learning. Realize that your concern for students as people and your desire for them to learn and master the material are not mutually exclusive.

## Conclusion

Although one's teaching persona is relatively stable at any given point, versatility and authenticity are key. We must be flexible in enacting our identities with students and colleagues depending on the demands of the situation, and perhaps our career needs and goals. Versatile, credible instructors are concerned with establishing personas that value students as people with their own needs and concerns. They care. They should also be concerned with the content and difficulty level of their courses and be clear and confident in their facilitation of the course. Although you certainly have some basic assumptions about who you want to be as a teacher, reflect on those goals and the persona you strive to communicate as often as possible. Key questions to consider include "Am I being authentic?," "Am I being flexible in response to situational requirements?," and finally, "Does my persona give equal care to my relationships with students and my content—or do I favor one over the other?" If you find an imbalance, try to identify strategies that will help you attend to both sets of concerns. This will support your efforts to become the most confident, caring, and clear teacher you can be.

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# Stop Blaming Students! Why We Must Teach Students, Not Content

Liz Norell

A few years ago, educator Chris Emdin came to our community college campus to give an opening-of-school lecture to faculty. As the author and champion of what he calls “reality pedagogy,” Emdin delivered a passionate, energetic call to faculty to reimagine their teaching as an act of empowering each student in the room. I distinctly remember him pulling his cell phone out of his pocket, holding it above his head, and asking, “When our students have the sum total of human knowledge in their hands, *what do they need us for?*”

That rhetorical question sent me down an entirely new path in my teaching, one focused on what students need from me rather than what I want to give my students.

I thought back to the teachers who had made the biggest impact on my life, wondering what qualities made them such effective, inspirational figures in my intellectual and personal growth. I kept coming back to one truth: My greatest teachers were those who saw something in me that I hadn’t seen myself. And they told me.

*“When you look for evidence that you don’t fit in, you’ll almost always find it. We will help our students find greater successes if we can first let them know that they are accepted and valued members of our community.”*

## Barriers to connection

Imagine you’re a first-generation college student. It’s your first day of classes, and you look at your schedule; on it, you see a feast of acronyms—things like CAT for location, MWF and TR for days, and something called a CRN. Would you know what these acronyms mean? A surprisingly large number of our students assume T indicates Tuesday classes and TR stands for Thursday classes. They don’t know what the building acronyms are; my students don’t know, for example, that CAT is the Center for Advanced Technology, a building where primarily social science classes are held.

But let’s say you find your class, and your professor hands you a syllabus (maybe) or

pulls it up on a projector screen (if the tech is working). The professor tells you when their office hours are scheduled. Would you understand that “office hours” means the professor has set aside that time for you to come by and chat, ask questions, or seek help? Or might you assume that “office hours” are their work hours, specifically when they are *not* to be disturbed?

Here’s another wrinkle: as a new college student, you might not know that you have to buy your own books. After all, most public high schools provide those for you. The professor tells you that you should bring your textbook to the next class. Where do you go? Would you know there’s a place on campus that sells books, or would you instead assume that the library is the source for your readings?

There are many of these cultural norms on a college campus that are unfamiliar to our most vulnerable students. They don’t know that tutoring from the math lab is free; for many of our students, tutoring was something only the rich kids could afford. Our students may not realize that the “services” we offer include emergency aid, a food pantry, and mental health counseling. In short, first-generation college students come into a new world with an unfamiliar vocabulary, and they frequently and quickly find themselves overwhelmed.

## What students need

As faculty, we have an important role to play in breaking down unnecessary barriers that might impede our students’ sense of belonging. In wrestling with the bigger question, “*What do they need us for?*,” I’ve come to believe that the faculty role breaks down into three spheres. We

- inspire our students with our enthusiasm for our subjects (and for learning more broadly);
- structure the material so they can build expertise; and
- coach them to achieve the goals they have set for themselves.

Just as importantly, though, we are modeling for students the traits we want to see more of in the world. Higher education is a place where we cultivate knowledge, seek understanding, get excited about learning.

Chattanooga State Community College, where I teach, has partnered with UVA’s Motivate Lab over the past several years, implementing interventions to boost student success. As you might surmise, their focus is on student motivation, which they model with the mnemonic GPS.

## G: GROWTH MINDSET

Students often enter college with a fixed mindset, assuming that they are good at some subjects and bad at others and that's just how they are built. Our systems of assessment and grading often reinforce this by providing students with a one-shot opportunity to demonstrate mastery. Carol Dweck's (2007) seminal research into fostering a growth mindset can help our students overcome some of their anxieties around being smart enough or good enough to succeed in college.

Consider whether you can provide students opportunities to redo their work. I've created a form to request a redo that includes reflections on what they did on their first attempt, what they will do differently on a second (or third) attempt, and what success looks like for them on this assignment. When I first deployed this form, I anticipated I would get flooded with revised assignments; instead, I'm often begging students to try again.

## P: PURPOSE AND RELEVANCE

Students rarely find the work we do in our classes to be relevant to their lives or aligned with their purposes for attending college. As instructors, we can foster more motivation among our students if we make our assignments more transparent. Each semester, I refine my assignment library to make the purpose and relevance of my assignments even clearer. I do a few other things, including blind assessment of written work, linking each assignment and activity to the institution's learning outcomes, and soliciting frequent student feedback on what kinds of assignments they find most valuable. If you'd like to explore helpful resources on boosting the clarity of purpose and relevance of your own assignments, I recommend starting with the [Transparency in Learning and Teaching \(TILT\) site](#) for tips on how to do so.

## S: SOCIAL BELONGING

Humans love to form groups. The second you put two or more people near one another, something largely invisible begins to happen. We don't always have language to describe it, but we've all experienced the way that emotions, thoughts, and cultures are transmitted through the ether, even when nobody is speaking. (Cavanaugh [2016] is an excellent entry point for this research as it applies to teaching.)

Unfortunately, many of our students arrive in our classrooms looking for evidence that they *don't* fit in. They enter a learning space worried about at least some of the following:

- Is everyone else smarter than me?
- Will the teacher like me?
- Will the workload be manageable?

- Can I afford to be here?
- Will my boss work around my school schedule?
- How many hours of sleep do I *really* need every night?
- Am I wearing the right clothes?
- Will I fail at college?
- Is this really going to help me get a better job?
- Will my car break down before the next class?
- Will I have enough money to buy food this week?

When you look for evidence that you don't fit in, you'll almost always find it. We will help our students find greater successes if we can first let them know that they are accepted and valued members of our community.

### **Ban the word *cover***

Too often we talk about how much material we have to “cover” in our classes. My typical semester is 15 weeks long, and most textbooks in my discipline have roughly 15 chapters. The math is too facile, though. Every group of students is different, arriving with different curiosities and different strengths. I believe the very best classes are flashes in the pan; they seize the current moment in time and tap into what's happening outside the classroom, in the students' lives, and where the students' (and faculty member's) curiosities are leading.

If we can shift our mindset from *covering* a set of chapters to *teaching* the human beings currently in our classrooms, we will create a cascade of shifts:

- The content of our course will never grow stale, because not all classes need the same material. Edmund Wilson (1976) wrote, “One can never read the same book twice” (ix); similarly, no two students ever take (nor does any professor twice teach) the same class.
- Consequently, every new semester represents a clean slate for us. Because every new class is its own unique constellation of personalities, curiosities, and needs, each new class is also an opportunity for us to discover new nooks and crannies in the course material.
- Encouraging students' curiosity and engaging with trying to find the answers to their questions has many benefits—for the students' sense of agency over their own learning and for keeping the material fresh for us as faculty. If higher education

seeks to create generations of lifelong learners, I can think of no better way to do so than to customize the course material to their interests.

- Perhaps most importantly, shifting the focus to our students palpably demonstrates that *they are important* co-creators of their learning. Particularly for those students who come to college convinced they don't belong, giving them the opportunity to be involved in charting the semester's course is a potent signal that they are not just along for a ride, possibly to be left behind. Indeed, they are critical to the course and to their colleagues—including us as faculty.

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# Engaging the Snapchat Generation

*Robb Beane*

The year 2020 brought many changes to education as we know it. A global pandemic has altered how education is delivered and how learning is accomplished. Schools no longer operate on a regular face-to-face schedule; we currently inhabit an online, hybrid, and occasional in-person teaching and learning environment. Changing one's teaching practice midstream can be challenging, but there are a number of applications online to assist with everything from the delivery of instruction to assessment. Students in classrooms today are more comfortable in a digital social environment with much of their peer-to-peer conversation occurring through video platforms such as Snapchat, Instagram, and TikTok. By accessing a similar tool to generate discussion over course content, we can create an environment where the students are more engaged.

*“Online video discussion boards are a great way to get students out of their comfort zones and share information for use within the classroom.”*

We all know how drab typewritten online discussion formats can be for both students and teachers. Flipgrid is the leading video discussion platform for millions of pre-K to PhD educators, students, and families in 180+ countries. Much like Snapchat, students use Flipgrid to record short, authentic videos that their teachers and classmates can comment on and reply to. Educators are fully in control of video moderation, access controls, and many more features. Students can capture widescreen videos, pause while recording,

add more after reviewing, and edit by removing unneeded dialogue for just the right influence. Imagine being able to interact with one another's discussions in video format instead of text. Students and instructors record short, authentic videos on any topic. Instructors can provide feedback via text or video, and Flipgrid also allows for peer-to-peer responses. Using video discussion boards is about engaging learning. Video discussion boards engage learning that is social, personal, without boundaries, about networking, and about promoting that we are all teachers and learners.

The Flipgrid format is simple: it consists of a dashboard containing your classes, identified as Groups. You may create as many Groups as you wish. Each Group contains your discussion prompts, called Topics. Topics are also unlimited in number, can be copied

and used in multiple classes or Groups, and can be shared with other instructors to modify or use as written. You can share your Groups and Topics with individual students, groups of students, an entire class, or multiple classes.

Flipgrid's functionality is based on sharing prompts or Topics with your students and having them reply through video. Topics can be questions, reflections, or any assignment for discussion. When creating a Topic for use in your class, you have a number of personalization tools at your disposal, such as control over the length of response (limited to 15 seconds to 10 minutes); the ability to add supporting media (videos, photos, or documents); allowance of comments and feedback; video features (text, emojis, screen-casting, and editing); and the use of rubrics to score the discussion posts. Once you share the Topic through your Group or via a link or QR code, students view it and record their responses.

Online video discussion boards are a great way to get students out of their comfort zones and share information for use within the classroom. Some students may feel more comfortable when asking questions or stating opinions through social media than when sharing within a classroom full of peers. The Flipgrid platform gives your students the opportunity to be creative in how they share their ideas, even allowing for editing to help them ensure the message they are trying to convey has been shared as they planned.

Flipgrid has many features that can assist you with the efficiency of your communication, lesson planning, and networking. Within the application, you can find a Discovery section that gives you the opportunity to network with other educators and to borrow from the Topics they have already created. If a Topic is shared, you can copy it and use it within your class as is or with modification. Another networking tool, Grid Pals, shows all of the Flipgrid users who are open to networking with other users. The Grid Pals network stretches all over the world, and other instructors are only a few clicks away. One of the most useful tools for efficiency and communication is Flipgrid Shorts. Shorts allow you to record screencasts up to 10 minutes in length. They are stored within your account and much like your discussion Topics are shareable via a link, Flipgrid code, or QR code. Classroom announcements, lesson descriptions, and mini-lessons can all be recorded in this manner.

We know that teaching in the new world has been taxing on instructors and students alike. I would encourage you to find and work with applications that you are comfortable with, applications that can do many things to help you be more efficient and engaging. Flipgrid can do many things and helps to bridge the gap between the Snapchat generation and the classroom. Flipgrid is owned by Microsoft and is offered as a free application. You do not even need a premium account to access all of the features; they are all there for everyone to use. With Microsoft ownership, Flipgrid also benefits from

consistent attention and regular upgrades. While its uses are practically endless, here are few examples of how I have witnessed others use Flipgrid use in the postsecondary classroom:

- Department announcements
- Current event analysis
- Project demonstration
- Project process reflection
- Mentoring/advisor communication
- Writing feedback
- Self-reflection
- Discussion boards
- Mini-lessons
- Shared experiences

Knowing that education may be forever altered by the forced changes from the pandemic, it is within everyone's best interest to take advantage of the opportunity we have to meet our students where they are at instead of hold them back. We will see more requirements to teach and interact online even when classrooms return to the environment we recognize from our past. Using applications like Flipgrid can be a simple way to meet those new requirements and to engage today's generation of learners with the content we are passionate about.

# Bridging Technology and Pedagogy with an Online Teaching Faculty Toolkit

*Myrna W. Gantner and Mandi Campbell*

**W**e had a vision. What if we could create an online teaching resource that is organized and presented in a way that makes sense to faculty? What if it not only functioned as a resource but also helped foster a community of online instructors?

## The vision

Technical solutions—a necessary but not sufficient condition—were not getting us where we needed to go. Developed over the years, our campus resources were solidly grounded in the technical use of our learning management system (LMS). Many of our more experienced online instructors, though, wanted more. Much more.

Faculty experienced with online instruction had been experimenting with ways to elevate the student learning experience to mirror the best of face-to-face teaching mixed with the convenience of the virtual environment. All of us have had moments of inspired success in our online classes, but no structure or collective community existed to promote sharing those individual successes so others could learn from them.

We knew we needed an accessible vehicle that could foster the magic of teaching and learning in the online environment. We also wanted to create a sense of what Fullan and Quinn (2016) call *collective purpose* among the faculty who demonstrated a commitment to learn together how to teach online exceptionally well. This was the vision that shaped the creation of our Online Teaching Faculty Toolkit.

## Who are we?

We are two colleagues with varied but complementary backgrounds. Experienced in teaching, we both are passionate about pedagogies that promote student learning, and we are committed to helping our colleagues with their own questions about student learning in their online courses. One of us recently returned to full-time faculty status after years as a university-level administrator; the other completed an advanced degree that paved the way for her new role as an instructional designer in our Center for Teaching and Learning.

## The development of the Online Teaching Faculty Toolkit

Conversations about our own learnings quickly turned to our colleagues who were new to online instruction. They eagerly sought guidance on how to use the LMS. As they

overcame the inevitable frustrations associated with learning a new technology, however, their attention turned to matters that faculty care most deeply about: effective teaching and genuine student learning.

As the demand for online courses grew at our institution—and proliferated when COVID hit—faculty new to online instruction needed help. Clearly, learning to *build* a course in the LMS was the easy part. Faculty realized they lacked the strategies and skills to *teach* online effectively. Missing, too, was a grounding in the learning sciences that support this work. Faculty wanted to know, “What does the research say? What strategies make a difference with student learning? Because bottom line, that’s what we care about.”

More specific questions came along, such as the following:

- How do I mimic the quality of face-to-face feedback in the online environment without it consuming so much of my time?
- How can I structure (and manage) group work to ensure my students learn the content deeply?
- How do I get students to watch my instructor-made videos, or any videos for that matter, which leads to the question: How can I engage my ruthlessly efficient online learners with the essential content?
- How can I create that spark? That joy of learning that comes when . . .

These questions shaped the toolkit as we experimented with course designs, pedagogies, and tools with promise for creating communities of learners.

## The design of the toolkit

Faculty-friendly language permeates the toolkit, while an aesthetically pleasing design points instructors in the right direction so they do not waste time finding answers to their questions. We were inspired to be highly conscious of the language we used and to prioritize the design after years of being frustrated by the existing website that hosted technical job aids and advice on course design. As we sifted through that website, we found ourselves getting lost in an abundance of information. From an instructor perspective, we found that much of what was available used the LMS’s technical jargon and did not speak to us in terms that we felt would help us in our frazzled teacher moments. We also noticed that the technical job aids never touched on *why* an instructor would want to use these tools from a pedagogical perspective.

The organization of the homepage of the toolkit is driven by the kinds of questions that we both repeatedly heard from other online instructors. The four main categories of the toolkit are presented in an order that might help instructors think through the *entire*

process of designing and delivering an online course. The first category, although not instructional in nature, guides faculty through the basics of course design. That's followed by three instructional needs categories: Creating Community in Your Online Classes, Presenting Engaging Learning Materials, and Offering Constructive Feedback. (See Figure 1).

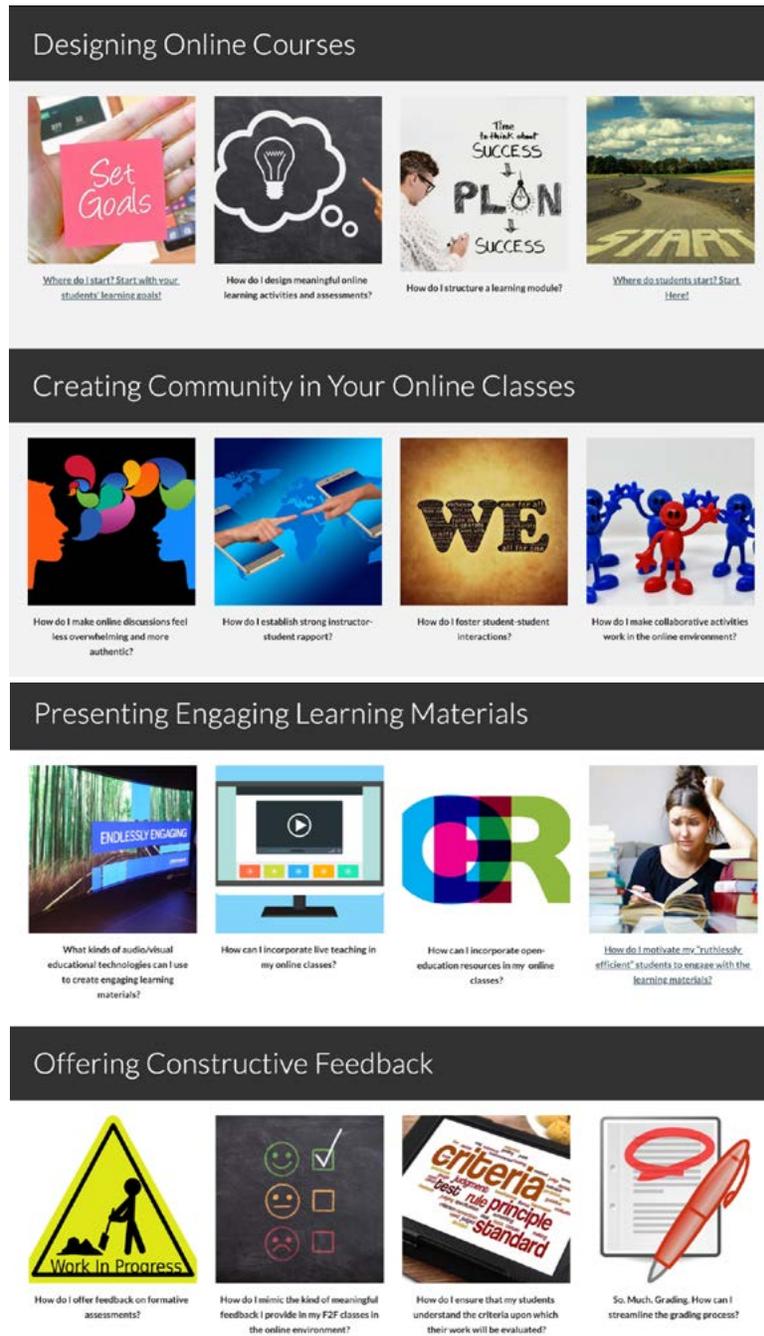


Figure 1. The homepage of the toolkit

## **Online Teaching Guides: the meat of the toolkit**

Although the design of the toolkit was critically important to reduce cognitive load, the meat of the toolkit is found in the Online Teaching Guides. The purpose of the guides is to present solutions to faculty who are seeking ways to engage their students in meaningful learning experiences. When instructors are in teaching mode, they sometimes have difficulty finding the help they need when they need it. Furthermore, screen fatigue and information overload are real barriers. The online teaching guides are designed with these problems in mind. We have structured them so that faculty can easily find the technical instructions they need while also learning about online teaching strategies that will make their courses more engaging and promote deep learning. The one-page teaching guides were in part inspired by Mishra and Kohler's (2006) TPACK model and the firm understanding that professors are masters of their content knowledge. These guides address pedagogical knowledge first and technical knowledge second. Each guide presents concrete, ready-to-implement, evidence-based online teaching strategies. (See Figure 2 on next page).

## Giving Meaningful Feedback Using Audio and Video Tools

Online instructors struggle to give meaningful feedback to their students, partly because written comments lack vocal intonations that convey emphasis, empathy, enthusiasm, and details that take too long to write out. Studies tell us that students like audio feedback, because it feels more personal and useful (i.e., includes more explanations and suggestions for improvement). Instructors report that they give more robust feedback, although it may take—on average—five minutes longer to create it. Video feedback is another option; record your face so students take in visual clues as you talk or use a screen capture tool to guide them through the feedback on their paper. Darby and Lang (2019) suggest these strategies.

### Online Teaching Solutions

1. Try using audio feedback to make your feedback more meaningful. Although studies indicate that audio feedback doesn't influence learning (as measured by grades), it does make a difference in student satisfaction (Voelkel & Mello, 2014), which influences positive engagement. Engaged students are more likely to respond to the attention by working harder and immersing themselves in the course content (Darby & Lang, 2019, p. 46).
2. Capture a quick video of yourself talking to your student as you explain your feedback (Darby & Lang, 2019, p. 126). Henderson and Phillips (2015) report that both students and faculty found video feedback to be more useful and motivating than written comments.
3. Record a screen capture where you talk your student through your feedback to their work as it's displayed on your computer screen (Darby & Lang, 2019, p. 126).

### Tech Tips

- To create audio feedback in CourseDen, see this guide: [https://uwgonline.service-now.com/kb/?id=kb\\_article\\_view&sysparm\\_article=KB0010429](https://uwgonline.service-now.com/kb/?id=kb_article_view&sysparm_article=KB0010429)
- To create video feedback, see this guide: [https://uwgonline.service-now.com/kb/?id=kb\\_article\\_view&sysparm\\_article=KB0010442](https://uwgonline.service-now.com/kb/?id=kb_article_view&sysparm_article=KB0010442)

### Further Reading

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Figure 2. Online teaching guide

Because we well know that using both new and familiar technologies to implement these teaching strategies can cause frustration, the guides include links to Technology Quick Guides that provide instructions for using various tools in faculty-friendly language. We also include a list of references so that instructors who would like to learn more about the learning science behind a particular strategy know what to read next. Many of the instructional solutions are accompanied by short videos (one to two minutes) made by instructors who tested and refined the strategies in their own online classes. They share how the solutions worked as well as the pitfalls they encountered, with suggestions to viewers to learn from their mistakes and successes.

### **The online teaching faculty community**

Our vision for the toolkit fit neatly into the ongoing work of the Center for Teaching and Learning, which sponsored a fall semester faculty reading group that we co-led, taking a group of 18 faculty through Darby and Lang's *Small Teaching Online* (2019). The authors' frank suggestions paved the way for substantive discussions with our faculty about the realities associated with online instruction and ways to make progress with what we most care about: students' success as learners.

We encouraged vulnerability in those sessions by modeling it first with stories of our own failures and subsequent corrective actions if and when we had figured things out. Open sharing in a safe environment—nothing was sacred—birthed what we fondly call our online teaching faculty community.

When we shared the prototype for the Online Teaching Faculty Toolkit with these faculty and asked for their suggestions and contributions, the response was overwhelming. Comments such as, "That's exactly what we need to make sure that I'm reaching my students and addressing their learning needs!" reaffirmed our belief that we were on the right track. We had the sense, too, that this toolkit could potentially ratchet up the cultural norms for interest in growing high-quality online instruction as a cross-campus expectation. We started to see a real opportunity to take the work we were doing with the faculty reading group *and* the subsequent development of our toolkit and embed it into our institution's academic culture.

Was it real? We wondered whether the community we were nurturing through informal means was real or whether we were projecting our desired expectations into their responses. Our answer arrived when COVID-19 hit in March 2020. The CTL director asked for faculty volunteers to mentor others who had been thrust into the online teaching arena literally over a weekend. Forty-four faculty answered his call for help, a number far higher than expected. The community was real, and it was growing. Together, we were able to (remotely!) teach our faculty not only how to use the tools but also recommend ways to use them to create courses full of engaging content and activities.

When we started working together back in December 2018, we had no idea that it would lead to the development of the toolkit and the establishment of such a dedicated community of online instructors. We certainly could not have predicted how valuable that toolkit would be. Our toolkit is proving itself to be a powerful resource that online faculty use as they create engaging and meaningful learning experiences for their students.

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# Systems Thinking: A Framework for Critical Thinking and Active Learning

*Kara M. Whitman and Jennifer E. Johnson*

As educators we seek to cultivate lifelong learners, critical thinkers, and active citizens (Brauer, 2017; Candy, 1994; Shor, 2012). This is challenging as the problems that our students must address are complex and “wicked.” Traditional methods of understanding these problems typically involve breaking them apart into more manageable pieces and looking at them individually. This can lead to unintended consequences as we lose our understanding of the bigger picture (Senge, 2006). If we continue in this manner, solving the complex problems of today may never be feasible. Systems thinking is an educational approach that focuses on recognizing the interconnections between the parts of a system and then synthesizing them into a unified view of the whole to better understand how to solve these dynamic problems (Assaraf & Orion, 2005; Senge, 2006).

*“Systems thinking is valuable for telling compelling stories that describe how a system works.”*

The *Chronicle of Higher Education* (Carlson, 2017) states that “systems thinking is a key attribute of the ‘T-shaped professional’—the employee who has depth of knowledge in a particular expertise as well as the ability to work and communicate across disciplines.” In response to this need, integration of systems thinking into education has increased over the past few decades. This includes not only an approach to teaching but also a series of habits, tools, and activities that teachers can apply directly in the classroom (Monat & Gannon, 2015). The Waters Center for Systems Thinking (2015) developed a suite of habits that should be the focus of a systems thinking education. A systems thinker will

- understand the big picture and resist the urge to come to quick conclusions;
- observe how variables within systems change over time;
- recognize that a system’s structure generates its behavior;
- identify leverage points in the system structure where action can be taken to change behavior;

- identify feedbacks and time delays in complex cause-and-effect relationships;
- change perspectives to increase understanding;
- explore how mental models and assumptions affect current reality and future realities;
- examine both short- and long-term consequences of actions; and
- analyze outcomes and change actions if needed.

## Applying systems thinking

Systems thinking is valuable for telling compelling stories that describe how a system works. Problems that are ideal for this approach have the following characteristics: the issue is important; the problem is not a one-time event; the problem is familiar and has a known history; and people have unsuccessfully tried to solve the problem before (Goodman, 2016). Senge (2006) explains that the natural “reactive mindset” students have to learning can prevent achievement of “deeper understanding.” There are many resources that help explain each one of these habits and the broader methodology, such as *The Systems Thinking Playbook* (Sweeney & Meadows, 2010) and *Systems Thinking Tools: A User’s Reference Guide* (Kim, 1995). One tool that is effective for identifying, describing, and communicating our shared understanding of systems is the practice of drawing causal loop diagrams, which allows students to develop shared pictures or stories of a situation. The following case study explores this notion through a systems thinking process.

## More whales = more fish: A case study of system connections and feedbacks

We adapted the case study shown in the video *How Whales Change Climate* (Sustainable Human, 2014) to engage students in the systems thinking process in an introductory environmental science course.

In this case study it was a misconception that removing whales would increase the number of desirable harvest species in the ocean. While this may be true in the short term, it is not true in the long term. This conclusion does not consider the cause-and-effect relationships and feedbacks within the system that affect the overall behavior. Whales feed deep in the ocean, returning to the photic zone, releasing fecal plumes that contain nutrients. Phytoplankton need nutrients to survive. If there are more nutrients, there will be more phytoplankton that can photosynthesize. Whales, through their movement, facilitate the vertical mixing of nutrients and phytoplankton throughout the layers of the ocean. Phytoplankton are a food source for fish and krill, and fish and krill are food for whales. When there are more whales, there will be more phytoplankton and more

fish and krill—the opposite of the misconception. The case study also shows the impact that whales have on the Earth’s climate and on their own habitat. Phytoplankton in the photic zone take in carbon dioxide. Phytoplankton, through photosynthesis, mitigate the impacts of carbon dioxide increases in the atmosphere and hence play a role in mitigating Earth’s climate, the temperature of the ocean, and habitat quality.

### A system thinking process

To explore any case study, we ask students to work through a series of steps. This process guides students in developing habits of a systems thinker as well as gain a deeper understanding of the given case study.

First, we ask students to identify whether the case study in question is a system. We ask them three key questions: Does the “system” have variables that interact with each other? Is the arrangement of those variables important to how the system behaves in space and time? Will removing a variable affect the behavior? If the answer to all the questions is yes, then it is a system. These conditions are met for the case study of whales in the ocean; therefore, it is a system and ready for further analysis through a systems thinking lens.

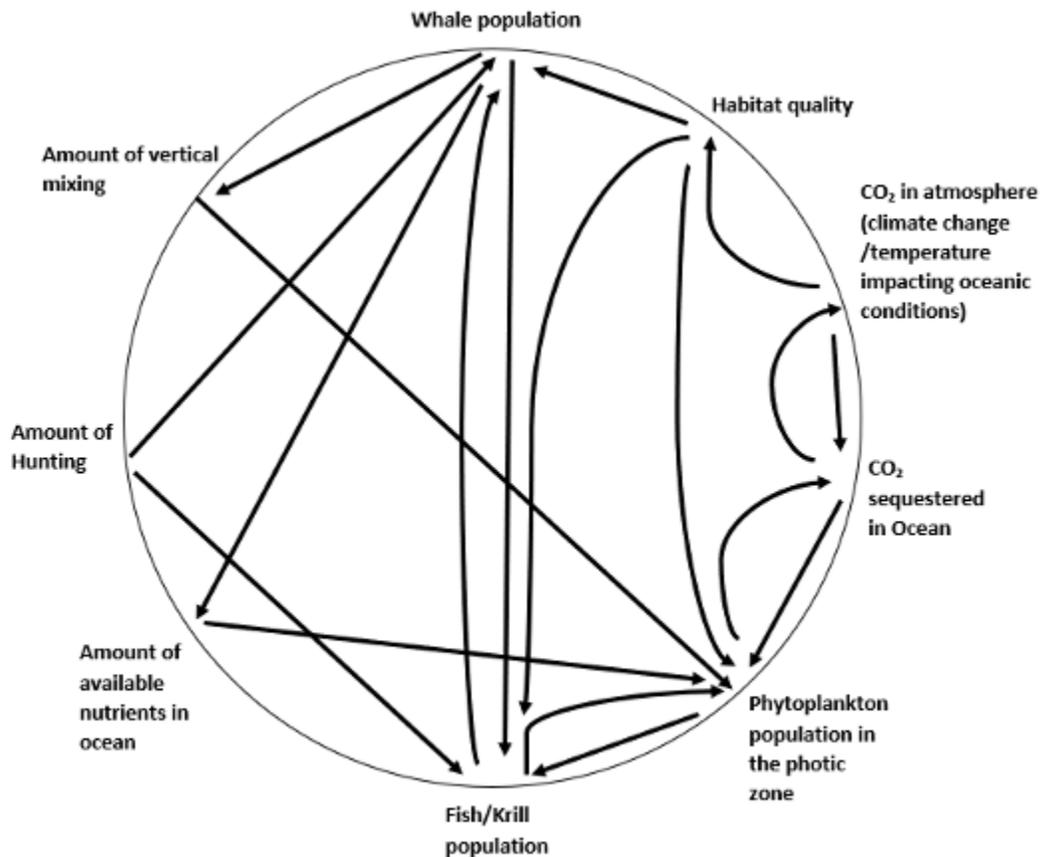
Next, we ask students to define the boundaries and identify the variables of the system. Each system can be delineated by its spatial and temporal boundaries. In the case study of the whales in the ocean, the boundaries can be defined as the surface layers of the ocean in which the whales interact over a specified amount of time. Then one can identify the critical variables of the system. We ask students to either read or view the case study and identify the variables of the system that interact with each other. Some key variables that students commonly identify in the whale case study are shown in the table below.

<b>The whale case study system:</b>	
Internal variables that fall inside the spatial and temporal boundaries.	External variables that fall outside the boundaries
<i>Whale Population</i>	<i>Other species populations in the ocean</i>
<i>Nutrients in the ocean</i>	<i>Amount of Fossil fuel burning</i>
<i>Humans hunting/hunting/number of whales /fish/krill removed from ocean</i>	<i>Etc.</i>
<i>Fish/Krill Population</i>	
<i>Plankton Population in the photic zone</i>	
<i>Amount of vertical mixing</i>	
<i>Carbon Dioxide CO2 sequestration in ocean</i>	
<i>Habitat Quality (e.g., from Climate change in atmosphere)</i>	
<i>Carbon Dioxide (CO2) in Atmosphere</i>	

Spatial boundary: all variables listed in the internal column above define your spatial boundary

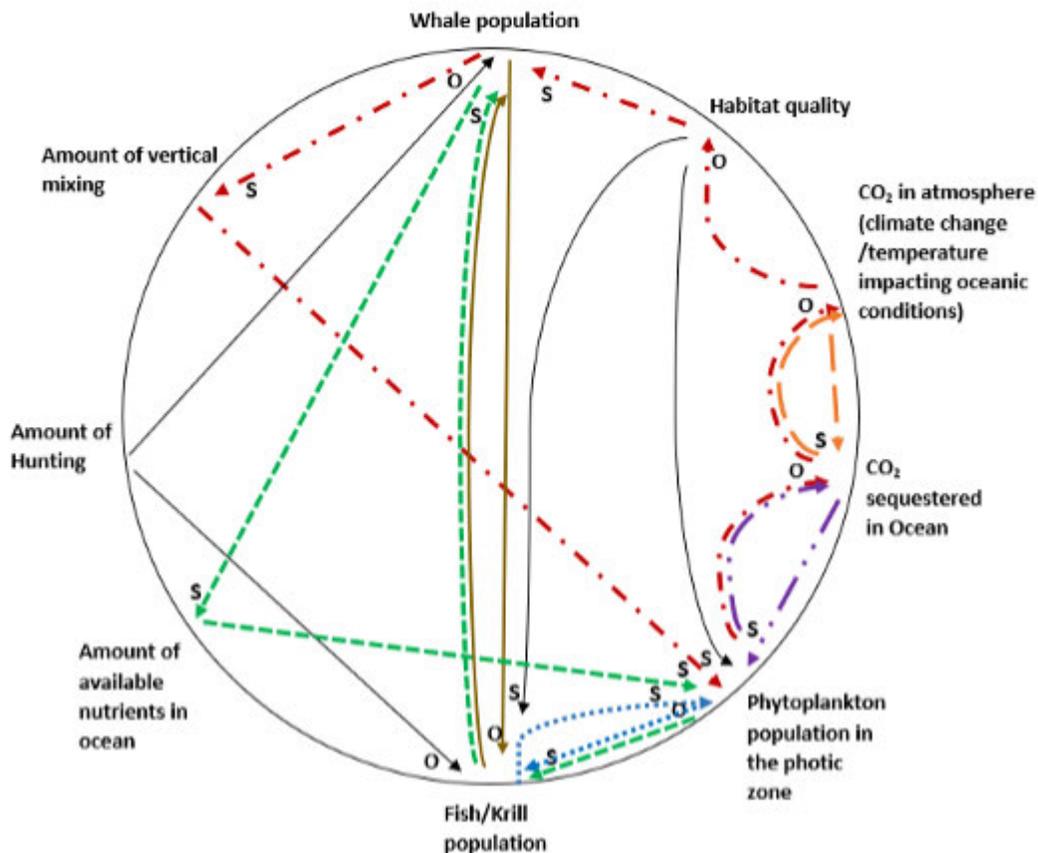
Temporal boundary: time span that will be assessed (e.g., one hundred years). Note that a time scale of thousands of years would change how variables interact.

After variables are identified for the case study, students examine the connections and interdependencies more closely. To do this, students use a systems thinking tool called a connection circle. Students are asked to draw a large circle and place all the internal variables identified around the circle. Then students are asked to identify all *direct* connections by drawing an arrow *from cause to effect*. Some variables can affect each other both ways, so we emphasize that students draw an arrow for each of those connections (e.g., whales affect fish and krill as they eat them, while fish and krill affect whales as their food source). See the connection circle below showing a connection circle for the whale case study.

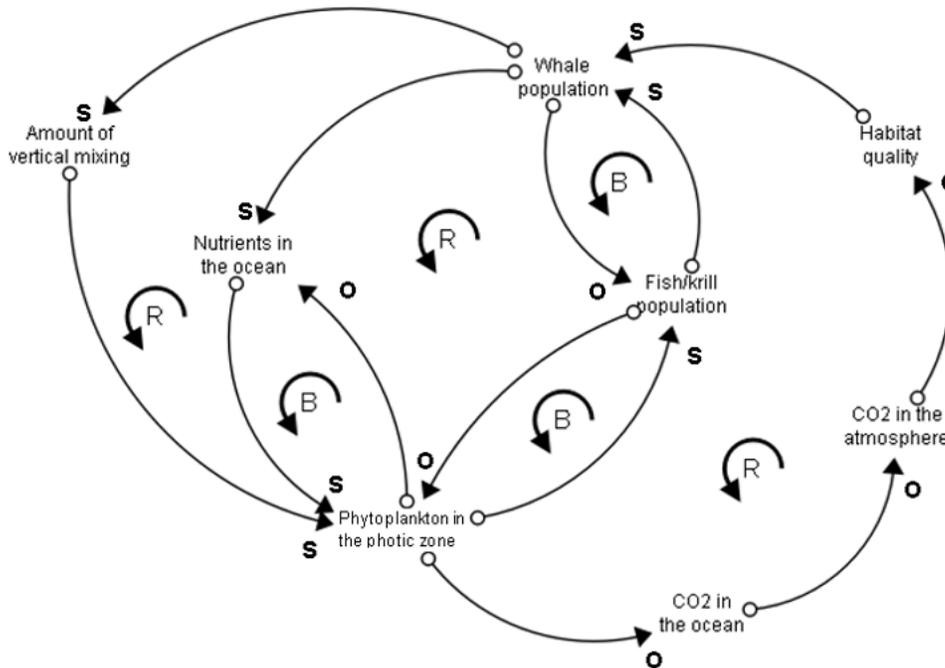


Finally, we ask students to explore the system behaviors present in the case study by identifying the polarity and feedbacks in the system. In the connection circle, labels are added to each arrowhead with either an S or an O. An S indicates that a change in the one variable causes the second variable to move in the same direction. An O indicates that a change in the variable will cause the connected variable to change in the opposite direction. For example, as whale populations increase, this will cause fish and krill populations to decrease as they eat them. This arrow would be labeled with an O signifying that they change in opposite direction. By contrast, as fish and krill populations go up, then the population of whales would also go up as their food supply increases. This would be labeled with an S as this connection changes in the same direction. See the example in the connection circle below showing the whale case study.

Students are also asked to identify feedbacks in the system, which exist when a change in one variable can loop around to affect that same variable through a series of system connections. The behavior that the feedback creates can be determined by telling the story of the polarity of each of those connections. We identify a few feedback loops in the connection circle below.



Now we can pull the feedback loops out of the connection circle and determine the type of feedback loop. A reinforcing feedback loop is one that amplifies the change, while a balancing feedback loop is one that limits change.



The diagram above shows the main feedback loops commonly identified by students in the whale case study. The connection between the whale population, nutrients in the ocean, phytoplankton in the photic zone, and the fish and krill populations is an example of a reinforcing feedback loop. This is a challenging step for students. To assist in this, we ask students to *tell the story*. For example, as the whale population goes up, nutrients in the ocean goes up, leading to more phytoplankton in the photic zone, leading to more fish and krill, leading to more whales. The connections reinforce the change in the whale population. This is a reinforcing feedback. Many balancing feedbacks are also shown. For example, as whale populations go up, this would cause a direct decrease in fish and krill populations which would then lead to a decrease in whale population as the food supply goes down. This is the behavior that leads managers to believe that hunting whales would increase the number of fish and krill in the ocean. But this neglects to recognize the other important reinforcing feedback loop: that having more whales increases the number of fish and krill.

## The big picture

The principles of systems thinking make it clear that there are no perfect solutions; the

choices we make will have an impact on other parts of the system. By anticipating the impact of each trade-off, we can minimize its severity or even use it to our own advantage. Systems thinking therefore allows us to make more informed choices.

This is especially important in higher education when designing a course that promotes critical thinking and reflection. Systems thinking provides a framework that can help the teacher rethink how their material is being presented to students. This methodology can also help students build essential skills that will allow them to apply a systems perspective to content in other classes and in their future careers.

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# Improving the Quality of Machine-Gradable Questions

Rebecca B. Orr and Peggy Brickman

Tests provide one measure of our students' learning according to the standards of the instructor and the field. But tests also affect our students socially, emotionally, and financially and influence their science-minded identities for years to come. We owe it to students to create fair tests with transparent expectations, clear guidelines for studying, and questions that adhere to scholarly practices. Our goal at the 2020 Teaching Professor Conference was to provide a road map to improving the quality of the machine-gradable test items. We emphasized crafting and aligning learning objectives with test items and provided an item-writing checklist to help instructors critique and improve their test items.

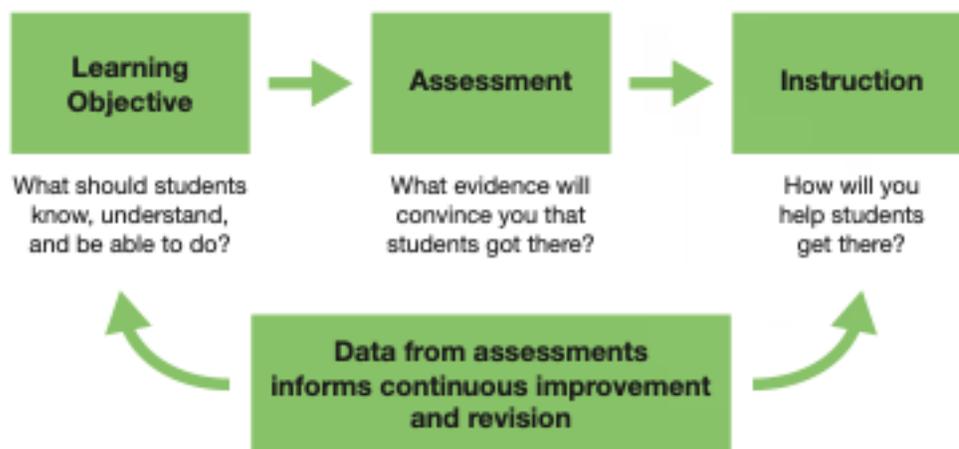
## Write clear, measurable learning objectives

Learning objectives connect teaching, learning, and assessment. They identify instructors' expectations, help instructors align their tests, and help guide students learning.

## CONSIDER BACKWARD DESIGN

Backward design begins with a consideration of learning objectives—what should students know, understand, and be able to do at the completion of the course. With clear learning objectives, instructors can substantiate claims about students' learning through assessments and plan instruction to help students reach mastery. Throughout the process, formative and summative assessment helps uncover gaps in student understanding and informs future instruction.

Figure 1.  
Process of backward design, adapted from Wiggins, G., & McTighe, J. (1998). *Understanding by design*. Association for Supervision and Curriculum Development



## COMPONENTS OF AN EFFECTIVE LEARNING OBJECTIVE

Effective learning objectives are behavioral, measurable, and attainable. They reflect national standards and expectations in the field and ensure that learning objectives include both core concepts and competencies (Rodriguez & Albano, 2017). When crafting learning objectives, focus on the behavioral and measurable criteria, as it may be difficult to standardize attainable objectives.

The two major components of a well-articulated learning objective are the expected performance (cognitive task defined by an action verb that communicates what students are expected to do) and the content (what students will work with). When writing learning objectives, it is often easiest to think first of the content area and then consider what you expect students to be able to do with that content.

<b>Components of a Learning Objective</b>
<b>Specify the performance—what students will do [action verb]</b>
<b>Draw a simple line diagram showing a segment of DNA from a gene and its RNA transcript, indicate which DNA strand is the template and the direction of transcription, and label (+/–) the polarities of <i>all</i> DNA and RNA strands.</b>
<b>Specify the content (what students will work with)</b>

## BLOOM FOR PERFORMANCE

Consider Bloom’s level of thinking skills and associated verbs when writing the performance aspects of a learning objective (Figure 2). Remember that the verb doesn’t dictate the expected thinking skill, as this is determined by the action or performance that students demonstrate with the content.

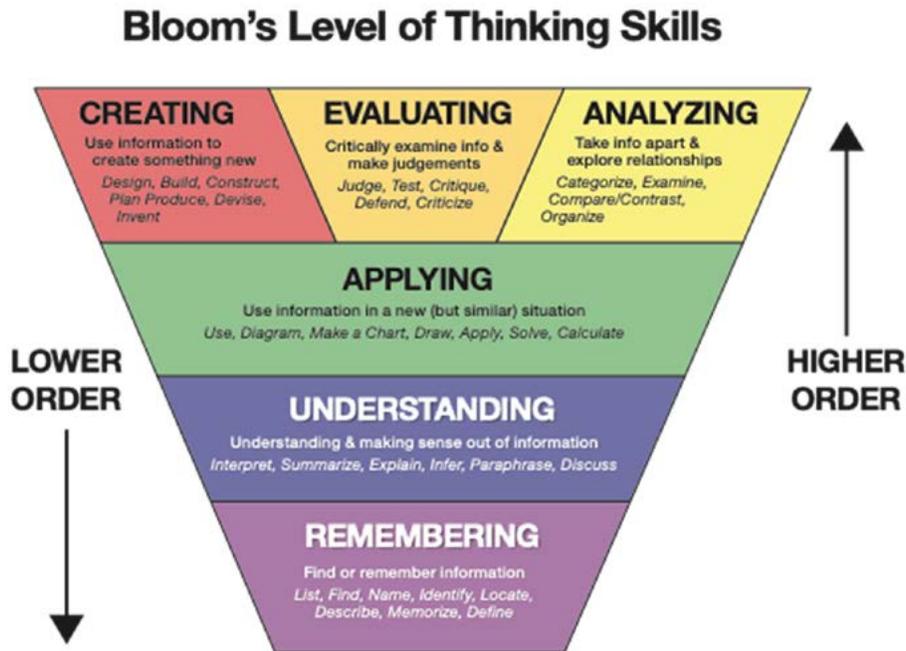


Figure 2. Bloom's level of thinking skills, Taxonomies of learning. (n.d.). Retrieved from <https://bokcenter.harvard.edu/taxonomies-learning>

## ALIGN ASSESSMENT WITH THE LEARNING OBJECTIVES

Be mindful that learning objectives guide student learning. Be specific and provide context so that students know how you will ask them to demonstrate their knowledge.

### Learning Objective

Discuss the relationship between cancer and mutations in tumor suppressor genes.



### Assessment Item

Which of the following **best** explains **why** mutations in p53 are observed in a large percentage of cancerous tumors?

- A. The p53 protein can increase the activity of DNA repair genes.
- B. Cells with faulty p53 proteins are more likely to undergo unregulated division.
- C. Tumor cells have a higher rate of mutation due to frequent DNA replication.

Figure 3a. Example of an item misaligned with a learning objective

### Learning Objective

Explain the relationship between cancer and mutations in tumor suppressor genes (like p53)



### Assessment Item

Which of the following **best** explains **why** mutations in p53 are observed in a large percentage of cancerous tumors?

- A. The p53 protein can increase the activity of DNA repair genes.
- B. Cells with faulty p53 proteins are more likely to undergo unregulated division.
- C. Tumor cells have a higher rate of mutation due to frequent DNA replication.

Figure 3b. Example of an item aligned with a learning objective

Consider the two learning objectives in Figure 3 from a student's perspective. Figure 3a mentions discussing cancer and tumor suppressor genes without much context. A student challenged with this assessment item might correctly think, "I didn't know I was supposed to focus on one tumor suppressor gene, p53! This teacher is so tricky." Small changes in the wording of the learning objective in Figure 3b can improve interpretation and thus effectiveness.

## Critique and write effective test items

Test items should measure students' mastery of objectives and inform future instruction. Well-written tests remove obstacles that confuse knowledgeable students as well as clues that support uniformed guessing (Albano et al., 2020).

## CONSIDER ACCESSIBILITY AND INCLUSION

Measuring learning should be free from bias, and tests should be accessible so that all students can succeed. Several studies have documented performance biases in cognitive difficulty of multiple-choice items when comparing gender, socioeconomic status, or anxiety (Ballen et al., 2017; Wright et al., 2016). This is not to say that we shouldn't be testing students with multiple-choice questions at all or that we should be wary of adding high-level cognitive questions on exams but that we should be aware that some groups of students might need more exposure to practicing these types of skills.

Instructors should also remember that students differ in their past experiences in ways that might make test items difficult for them. Tests should not reinforce cultural stereo-

types, and instructors should be cognizant of bias when writing test scenarios. They should construct tests that minimize excessive or unnecessary reading and be aware of some students' physical disabilities that may hinder their success on the test. Finally, they might consider ways to alleviate the stress of stereotype threat when delivering test items (Steele, 1997).

## USING SELECTED RESPONSE ITEMS

The focus of our workshop was on selected-response items that are machine gradable. These item types allow broad content coverage, are ubiquitous (especially in large classroom formats), and are easy to grade. Learning objectives that analyze conditions and phenomena, apply concepts and principles in new situations, and solve problems are measured very well using selected-response items. High-quality selected-response items are challenging and time-consuming to construct well. Farley (1989) estimated that experienced practitioners will take an hour to write one "good" multiple-choice question.

## TYPES OF SELECTED RESPONSE ITEMS

Some types of selected response items are more effective than others. Most instructors are familiar with conventional multiple choice. Forty years of research have shown that discrimination of student knowledge or understanding of the content (or both) is not significantly increased by having four to five distractors rather than only three distractors (Rodriguez, 2005). Problems have been identified with standard true-false items, and multiple true-false items are now recommended. Multiple true-false items allow instructors to set up a context or situation for students to evaluate discrete areas of content, allowing them to more specifically determine what students do or do not understand and better informing future instruction (Hubbard et al., 2017). Other recommended item types include alternate choice and matching items.

## ITEM CONSTRUCTION

In writing test items, it is important to consider content, question formatting, a well-written stem, and well-written answer options. Figure 4 outlines the general structure of selected-response items.

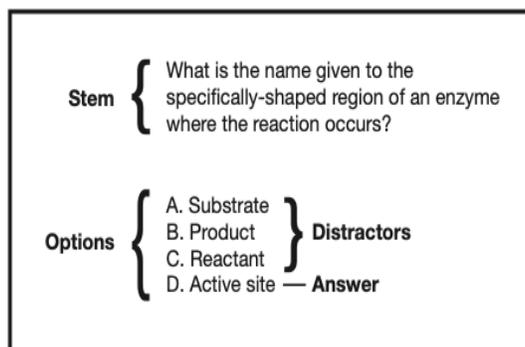


Figure 4. Selected-response item structure

Instructors are encouraged to use the item-writing checklist (Figure 5) to increase the quality of their test items. High-quality items yield more reliable information about student learning. This provides data that informs instruction and allows for continuous improvement and revision, bringing instructors full circle in the backward design process.

<b>Content Concerns</b>
1. Base each item on one aspect of content and one cognitive task.
2. Use new material and context to elicit higher-order cognitive skills.
3. Keep the content of items independent of one another.
4. Test important content. Avoid overly specific and overly general content.
5. Avoid opinions and trick items.
<b>Formatting</b>
1. Format each item vertically instead of horizontally.
2. Edit and proof the items.
3. Keep the language complexity of items at an appropriate level for the class being tested.
4. Minimize the amount of reading in each item. Avoid window dressing.
<b>Writing the Stem</b>
1. Write the stem as a complete question or a phrase to be completed by the options.
2. State the main idea in the stem clearly and concisely and not in the options.
3. Word the stem positively; avoid negative phrasing.
4. Move any words that are repeated in each option into the stem.
<b>Writing the Options</b>
1. Write as many options as are needed given the topic and cognitive task; three options are usually sufficient.
2. Make all distractors plausible.
3. Make sure that only one option is the correct answer.
4. Place options in logical and numerical order.
5. Vary the location of the correct answer evenly across the options.
6. Avoid using the options none of the above, all of the above, and I don't know.
7. Word the options positively, avoiding negative words such as "not."
8. Avoid giving clues to the right answer:
a. Keep the length of the options about equal.
b. Avoid specific determiners including "always," "never," "completely," and "absolutely."
c. Avoid clang associations, options identical to or resembling words in the stem.
d. Avoid pairs or triplets of options that clue the test taker to the correct answer choice.
e. Avoid blatantly absurd, ridiculous, or humorous options.
f. Keep options homogeneous in content and grammatical structure.

Figure 5. Item-writing checklist, reproduced with permission from Rodriguez, M., & Albano, A. (2017, p. 53)

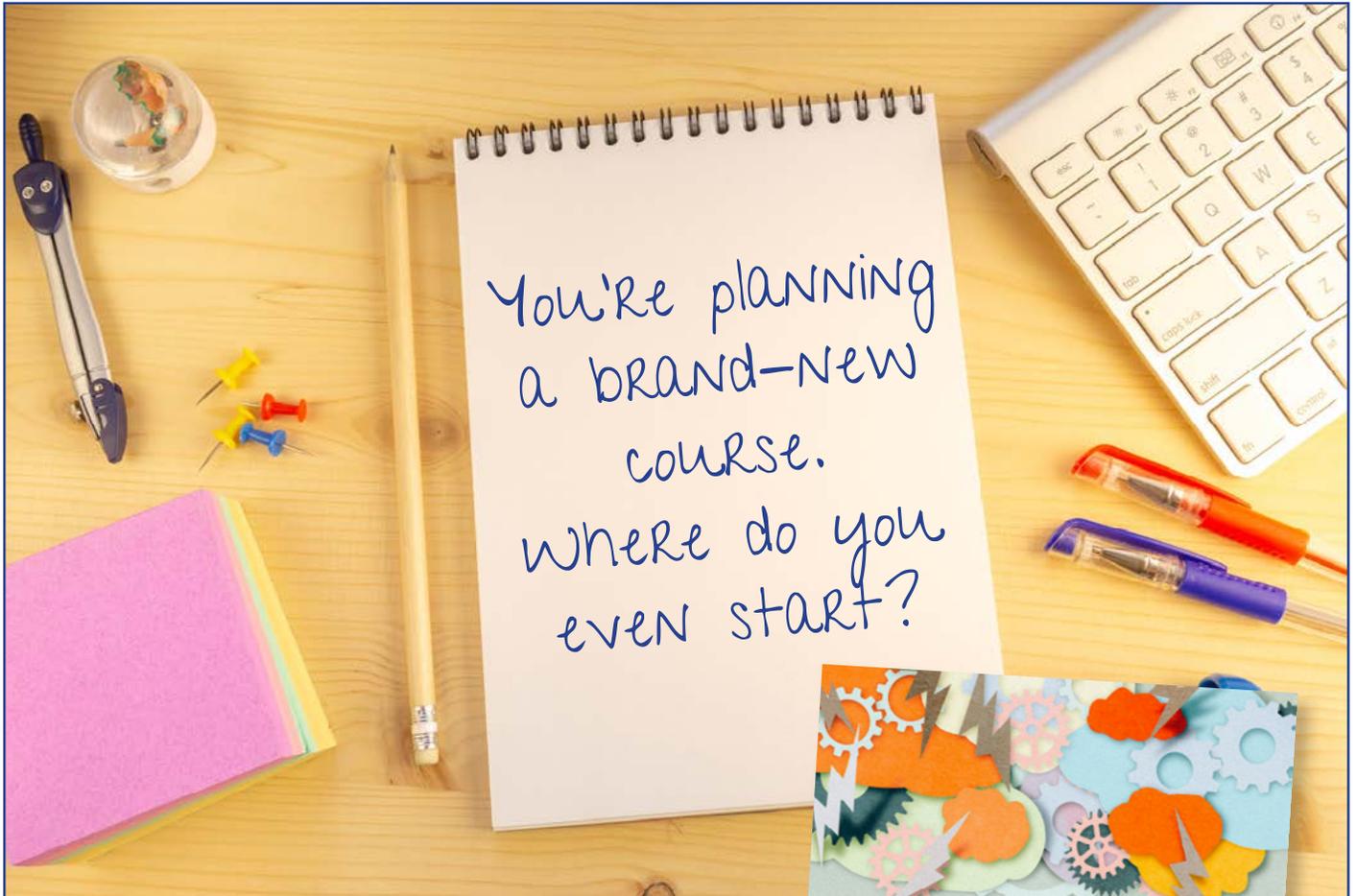
## Next steps

Improving assessment efforts should be an ongoing process for all instructors. The recently formed Advancing Assessment Skills in BIOlogy Network, or ASK BIO network, is

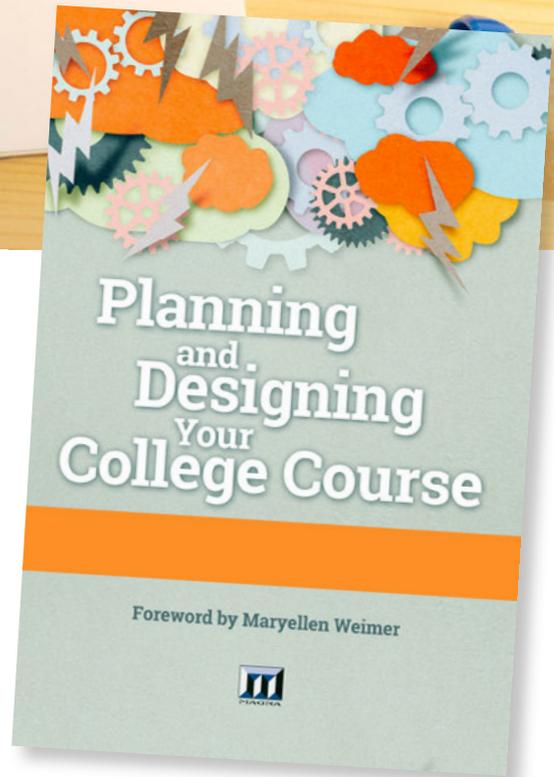
designing and sponsoring faculty development workshops to support life science instructors as they learn to write machine-gradable assessment questions that align with learning outcomes inspired by the *Vision and Change Report* (AAAS, 2011) and present a high level of cognitive challenge. In addition, the ASK BIO network (Dr. Heather Seitz, Program Director, Johnson County Community College, [hseitz@jccc.edu](mailto:hseitz@jccc.edu)) will support continued interaction among workshop attendees who work in geographic proximity as they continue to improve the quality of their assessments.

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# Using a Data-Driven Approach to Write Better Exams

*Alym A. Amlani*

Like many faculty members, I started teaching as a subject matter expert without a formal background in education. My examination questions were either based on questions I recall from my personal experience as an undergraduate or questions provided to me by more senior faculty. Since a poorly written exam could mean the difference between a student passing or failing my class, I wanted to learn more about exam design. What makes a good exam question? A good exam?

Based on my review of the literature, this article summarizes best practices to help you improve the quality of your exam questions and consequently your exams. The focus is on the interpretation of the item analysis reports generated by your institution's learning management system (LMS) so you can look beyond median student scores to determine the effectiveness of your exam. I'll also provide suggestions to help you develop better test questions.

## **Why do faculty dislike multiple choice questions?**

Many faculty don't like multiple-choice questions. When asked why they don't use them, they respond, "They're too easy," "They don't test subjects in depth," or "They're unfair to non-native speakers of English."

In many instances, these criticisms are fair. At times, a case study or a task-based simulation will do a better job of assessing student learning. But by following the best practices discussed below, you can use the multiple-choice format to create effective questions that you can evaluate using item analysis.

## **What makes a good exam?**

A good exam is fair; your students should feel that you assessed them on the content you taught them and expected them to learn. Exam questions should be appropriately difficult; they should challenge students without making the exam impossible.

According to Butler (2018),

The primary goal of assessment is to measure the extent to which students have acquired the skills and knowledge that form the learning objectives of an educational experience . . . To do so effectively, a test needs to differentiate

students who have greater mastery of the to-be-learned skills and knowledge from students who have less mastery, which is referred to as *discriminability*.

Finally, an effective assessment should be both *reliable* and *valid*.

A test is reliable if test writers possessing similar subject matter knowledge earn similar marks on an examination. A test is valid if it measures what it intends or claims to measure. Reliability and validity measure different things. A ruler that was printed incorrectly, with each centimeter being slightly too long, would *reliably* measure the same distance each time. But the measurement would lack *validity* as the ruler does not measure the distance in centimeters.

### Using item analysis to evaluate exam questions

LMSs automatically generate statistics you can use to improve your examinations. Item analysis will enable you to assess the validity and reliability of your exam and the effectiveness of your distractors (the incorrect options in a multiple-choice question).

There are three parts to item analysis: assessing item difficulty, assessing question discrimination, and analyzing distractors.

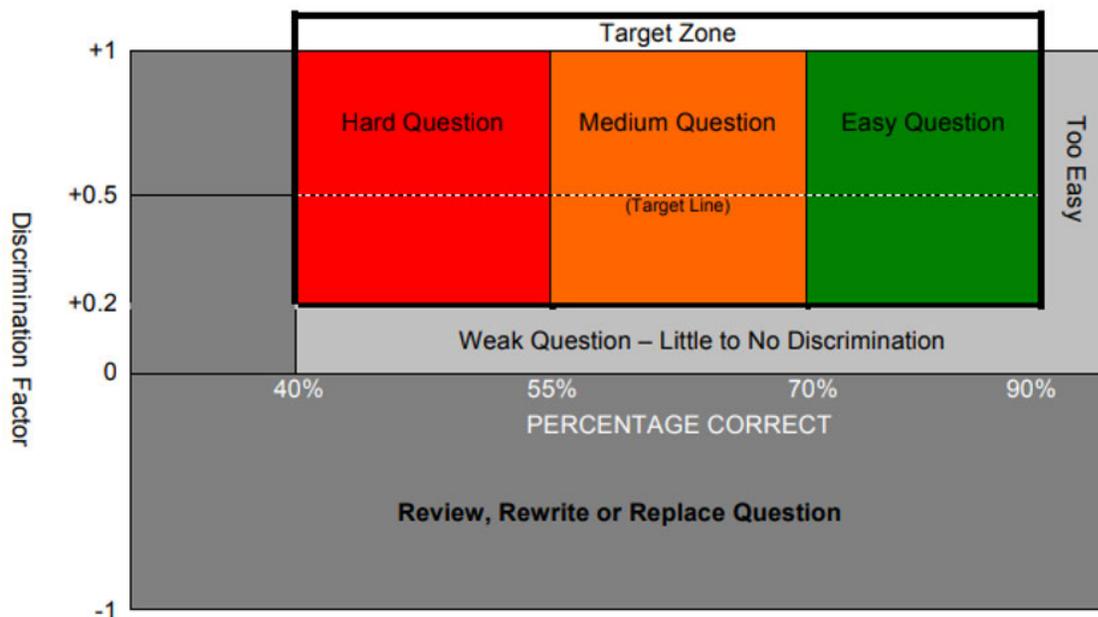


Figure 1. From [http://www.gravitykills.net/Directory/Assessment/Item\\_Analysis\\_with\\_ZipGrade.pdf](http://www.gravitykills.net/Directory/Assessment/Item_Analysis_with_ZipGrade.pdf)

## 1. ASSESSING ITEM DIFFICULTY

The question difficulty is the proportion of examinees who answered the question correctly. A question difficulty of 0.3 or less means that fewer than 30 percent of examinees answered it correctly. Why did so many students get it wrong? Was there something about the wording that made it difficult? Was tricky wording used? Was the question too complex or the topic too difficult? You should eliminate questions that are too difficult.

You should also remove questions that are too easy, ones that almost everyone answers correctly. Personally, I leave a few in my exams to boost student confidence. But from a psychometric perspective, this is probably bad advice.

Most questions should be of moderate difficulty. The literature differs on what this means, but I aim for questions where between 50 and 70 percent of the class answer correctly. One point of note is that the *ideal* difficulty (from a psychometric perspective) is 50 percent. This would also mean your class average would be 50 percent. My students would revolt if the class average were 50 percent.

## 2. ASSESSING QUESTION DISCRIMINATION

The discrimination factor (DF) (also known as the discrimination index) is a score between  $-1$  and  $+1$ . The DF measures whether a question effectively separated skilled examinees from unskilled examinees. The higher the DF score for a question, the better.

A *high positive* DF means that examinees who scored well on the question also scored well on the exam while those who scored poorly on the question also scored poorly on the exam. A *high negative* DF indicates the reverse situation.

Ideally, your exam questions should have high DF values; however, there are times when it is appropriate to include questions that do not. If you want to assess whether *everyone* learned something critical, you might include a question that tests this key concept. The question shouldn't separate students from each other. If many students get it wrong, you may want to revisit how the material is taught in class.

If a question has a negative DF, your good students are getting it wrong while your weaker students are getting it right. Perhaps the question is tricky or your good students are overthinking it. Remove or remedy any question with a negative DF.

Questions with a DF of less than 0.2 discriminate poorly; that is, the correlation between a student's score for the question and the rest of the exam is weak. These questions require improvement. Questions with DFs greater than 0.5 are doing an excellent job at rewarding your best students. Good students are getting these questions right and weaker students are getting them wrong.

### 3. ANALYZING DISTRACTORS

Better distractors will lead to better DFs. You want most students to choose the keyed response and to distribute the incorrect responses across the distractors. If students never select some distractors, remove or replace these. It is better to have fewer distractors than to have distractors that are implausible or rarely selected. Watch for questions for which most of the class chooses the wrong answer! This could mean your keyed response is wrong or that the question is poorly designed.

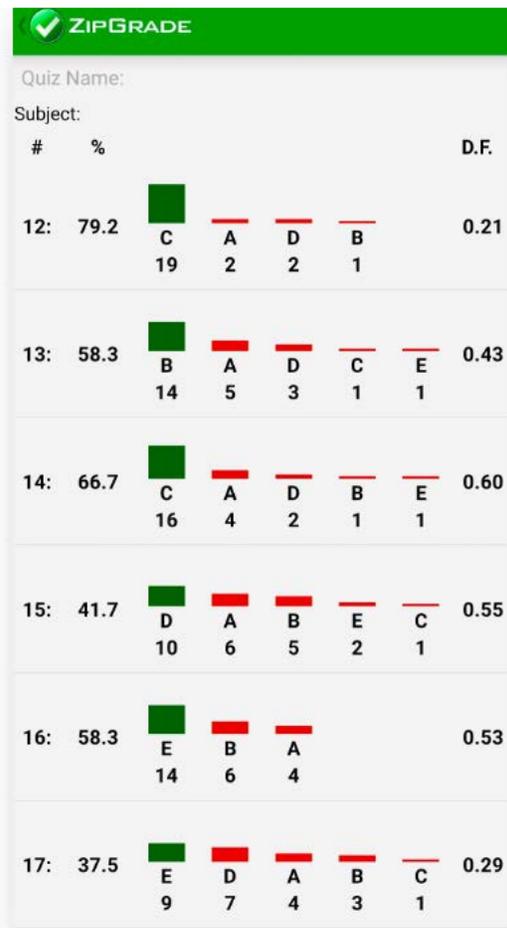
Let's look at three examples of item analysis.

#### Example 1

**Question 12:** This question is too easy because nearly 80 percent of students answered it correctly. No one chose distractor E; thus, it could be eliminated. All distractors for this question should be revisited and revised to improve plausibility.

**Question 16:** While discrimination is good, no one chose C or D.

**Takeaway:** Review the questions to make the problematic distractors more plausible.



ZIPGRADE							
Quiz Name:							
Subject:							
#	%				D.F.		
1:	45.8	 C 11	 E 11	 B 2	0.35		
2:	95.8	 D 23	 E 1		0.10		
3:	83.3	 D 20	 E 2	 A 1	 C 1	0.40	
4:	33.3	 E 8	 C 7	 D 5	 B 4	0.28	
5:	87.5	 A 21	 C 3			0.06	
6:	66.7	 A 16	 E 4	 D 2	 B 1	 C 1	0.14

### Example 2

Questions 2, 3, and 5 are too easy because the percentage of students answering them correctly is well above 80. Questions 2 and 5 also don't discriminate well ( $DF < 0.2$ ). Despite being easy, question 3 discriminates reasonably well, so it probably could be left as is.

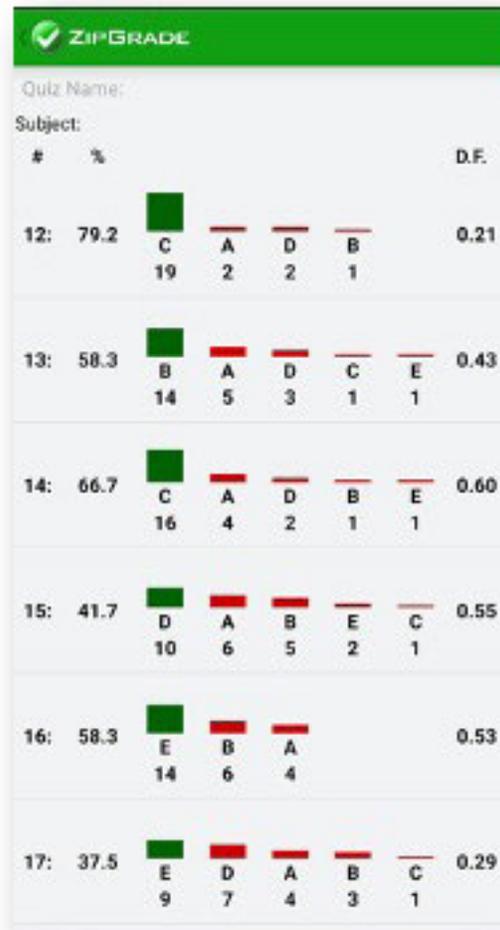
Questions 1 and 4 are probably too difficult. We should look at both questions to investigate why students answered them so poorly. Both have a  $DF > 0.2$ , so they may be useful to separate top students from each other.

Question 6 has a low DF despite an appropriate difficulty. The distractors also are well distributed. It may be worth revisiting this question to see whether wording could be improved as the question itself may be poorly written.

**Example 3**

Question 14 is an excellent question.

About 67 percent of the class got this right. The DF is 60 percent. Incorrect responses across all distractors. You want many questions like question 14.



**Ten tips to improve your exams**

In their seminal, widely cited paper, Haladyna et al. (2002) made 31 recommendations to develop better exams. This paper is well worth reading in its entirety. Here are 10 of their recommendations:

1. *Align test questions to learning outcomes.* Create a test plan and think about which learning outcomes you want to measure and to what depth.
2. *Test on novel material to measure understanding and application.* Don't repeat exact wording from study material. Otherwise you'll be testing recall and aiding examinees who search for solutions online.

3. *Ensure that each question tests a single learning outcome.* While it is tempting to test more than one learning outcome in a question, if an examinee gets it wrong, you won't know which learning outcome led to the incorrect answer.
4. *Avoid trick questions.* Trick questions involve stems that are overly complicated, including too much irrelevant detail or using words that are ambiguous or complex. Keep your questions focused and to the point.
5. *Proofread your exams.* Test creators often pay more attention writing their keyed response (the right answer) than the distractors. A good test-taker might look for grammar errors to eliminate possible incorrect options.
6. *Keep options homogeneous in content and grammatical structure.* Avoid using grammar changes between the stem and the response to provide clues to the correct answer.
7. *Keep the length of options about the same length.* Don't make the correct answer the longest or shortest response. Distractors that are both lengthy and plausible can be challenging, yet quite fun to write!
8. *Avoid options that give clues to the right answer.* The literature is a bit mixed on this topic. As a guideline, avoid negative words, such as *not* or *except*. Consider asking "Which of the following *is*" instead of "Which of the following *is not*."
9. *Make distractors plausible and include typical examinee errors when writing distractors.* If no one chooses a particular distractor, it isn't adding any value to your test! Distractors can be based on common student errors, linked to common misconceptions, or use familiar keywords that are semantically related but incorrect. One tactic is to make statements that are true but unrelated to the question being asked. Another approach is to review your open-ended questions to look for common student errors. These make for excellent distractors.
10. *Use humor in your exam only if it's compatible with your teaching style.* If you don't use humor in the classroom, your exam is probably not the best place to crack a joke.

### **What about "none of the above" (NOTA) questions?**

A common practice by instructors is to include NOTA distractors in their multiple-choice questions.

According to Blendermann et al. (2020),

When an initial multiple-choice item uses NOTA as an *incorrect* alternative . . . retention of tested information tends to be as good as standard (non-NOTA) multiple-choice items. However, multiple-choice items become much more difficult to answer correctly when the NOTA choice is correct and *later retention suffers as a consequence*.

Students learn by taking our exams. NOTA distractors, whether correct or incorrect, can interfere with the learning process.

## Distractor best practices

Increasing the number of distractors does not improve multiple-choice questions. Rodriguez (2005) did an exhaustive look at 80 years of research and concluded that the best balance between quality and efficiency is only three options: the correct answer and two plausible distractors.

By including fewer options, you can ask a larger number of multiple-choice questions in the same amount of time, which improves exam reliability. It's better to have fewer plausible distractors than to add an extra one for the sake of having it there. If a student is unlikely to pick a distractor, don't put it on the exam.

## Conclusion

The literature provides useful guidance to help you create or select effective exam questions. Try creating questions in your LMS to assess your students. By reviewing your item analysis report from whatever LMS you use, you can continue to improve your exam questions and your exams.

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# Community in 2021: Giving, Gathering, and Engaging

*Courtney Plotts*

If 2020 taught us anything, it's that a sense of community is critical to the well-being of students and faculty in the higher education arena. A sense of community is defined as the feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared meaning that members' needs will be met through a commitment to be together at various points in time (McMillin & Chavis, 1986). Many students and faculty members lost their sense of community when access to a physical campus and social experiences occurring in that space were removed and emergency remote teaching was introduced. Almost a year into emergency remote teaching, faculty, administrators, and students are still feeling the loss of a sense of community.

## **Identifying the barriers to community and connectedness**

When emergency remote teaching began, many people experienced a diminished sense of a locus of control in their lives. This cognitive shift greatly affected motivation levels of both faculty and students. Many social support systems across the globe were similarly affected, leaving many individuals feeling isolated and disconnected from the social aspects of their lives. Isolation is one of the key components that creates a psychological barrier in one's ability to perceive a sense of community and connectedness.

Additionally, many students and faculty members experienced marginalization: a person or custom that becomes identified as one that is not accepted fully into the larger group. According to the American Psychological Association (2020), however, marginalization is also a strategy that an individual or group members use to cope with acculturative stress. In this instance, the loss of campus culture that accompanied emergency remote education caused acculturative stress. This change created many constraints to building and maintaining genuine connections in online spaces, thus significantly increasing feelings of isolation and separation from what had been an accessible space for most members of the community.

The psychological fatigue of transactional distance also contributed to a lack of a sense of community. Transactional distance is the actual (physical) and perceived (psychological) barrier created when individuals communicate and connect in online spaces. Because people were either not ready to make the transition to online spaces or resistant to educational online spaces, the removal of the physical campus space and its social connections left a large psychological void that, for many in higher education, exacerbated

ed feelings of isolation, detachment, and loss. This gap widened exponentially and led to some unintended and unforeseen consequences related to well-being and connectedness in online spaces, including an increase in depression, anxiety, and loneliness for many people. Building a sense of community has been shown to decrease such feelings.

## **Addressing the barriers to community and connectedness**

So, in 2021, how can the community of higher education increase aspects of belongingness, connection, and well-being to improve our online campus culture? We can start with three concepts: giving, gathering, and engaging.

**Giving** is an essential part of altruistic behavior. Giving also demonstrates general care for one another. Give opportunities that allow individuals to have influence when possible. Give, highlight, and support influence in your learning community. Share your goals for how the learning community should influence each member and how each individual member has the power to influence the learning community. When planning your next course, identify areas where students can influence the learning process, such as curriculum, content delivery, and assignment options. Creating explicit goals to help students establish a sense of community within the course. Identifying community learning goals builds a stronger sense of locus of control for members of your learning community.

**Gathering** can also help build a sense of community. Prior to reviewing your syllabus, address student needs by gathering resources that you believe can help students outside of the academic setting. Building a sense of community includes sharing information about community resources associated with housing, mental health, healthcare, and financial assistance. United Way has a [referral service](#) that assists most of North America and is available 24 hours per day and seven days per week. Potentially, all students can benefit from this information. In my courses, students and I review the information before addressing anything about the course. Gathering and sharing information that supports students' well-being demonstrates that faculty understand communities other than their own and outside of the culture of academia. Gathering and sharing this type of information can contribute to improving class attendance, participation, and course completion. It helps students know that faculty members do understand some of the diversity of circumstances and lived experiences of our students.

**Engaging** students during emergency remote teaching is challenging. Engaging students in online spaces is a specialized skill set that many faculty members did not possess. To that end, create a sense of community charter for your course and a rubric. Taking these steps supports psychological and social well-being of learning community members. Focus on grading connectedness and allow students to grade their connectedness to the course as well. Student feedback may uncover some facets of your course that are working well that were previously unknown to you. Complete community feedback

every other week for best outcomes. Students feel more connected when they know that they are not alone in feeling a disconnect between themselves and their peers or faculty members.

Overall, 2020 was a challenging year for educators, students, and administration. In 2021, let us focus on the importance of building physically, emotionally, and psychologically safe and healthy communities. Communities with no barriers. Communities that are vibrant and accessible for all students. Communities that allow for extensive academic exploration. Communities that allow student and faculty to influence each other in meaningful ways. Communities that support the greater good and communities that truly connect us with one another.

## ABOUT THE CONTRIBUTORS

**Alym A. Amlani**, CPA, CA, MPAcc, is a business instructor at Kwantlen Polytechnic University, Langara College, and the University of British Columbia. He teaches financial accounting, cost accounting, financial modeling, information systems, and data analytics.

**Robb Beane** is a veteran educator whose career has guided him through several roles. He holds several degrees, including an MEd in educational psychology, an EdS in educational leadership, and an MBL. Currently, Robb serves as an instructor of education and a student teaching supervisor for William Penn University.

**Peggy Brickman**, PhD, is a Josiah Meigs Distinguished Teaching Professor at the University of Georgia who annually teaches introductory biology to approximately 600 undergraduates. Brickman conducts research on learning in the college STEM classroom and has developed several instruments to measure gains in scientific literacy skills and motivation to learn science. Her current research aims to examine the role of group interactions in promoting learning in large enrollment courses.

**Mandi Campbell**, EdS, is an instructional designer at the University of West Georgia, where she supports faculty as they design and implement both online and face-to-face courses. She also teaches composition, literature, and first-year seminar courses.

**Myrna W. Gantner**, EdD, is an associate professor of educational leadership at the University of West Georgia, where she teaches in online educational leadership programs. She is the former associate provost at UWG and a K-12 principal and evaluator of instructional technology grants.

**Jennifer E. Johnson**, MEd, is a PhD candidate in environmental science at Washington State University. Her dissertation focuses on using systems thinking to improve student understanding of complex socio-ecological systems.

**Zac Johnson**, PhD, is an associate professor of communication studies at California State University, Fullerton.

**Sara LaBelle**, PhD, is an associate professor and assistant dean in the School of Communication at Chapman University.

**Liz Norell**, PhD, teaches political science, podcasting, and college success at Chattanooga State Community College.

**Rebecca B. Orr**, PhD, is a professor of biology at Collin College in Plano, Texas, where she teaches introductory biology for science majors. Orr has a passion for investigating strategies that result in more effective learning and retention and is a certified Team-Based Learning Collaborative Trainer Consultant. She is a coauthor of *Campbell Biology* and *Campbell Biology in Focus* and a Howard Hughes Medical Institute (HHMI) BioInteractive Ambassador.

**Courtney Plotts**, PhD, is the national chair of the Council for At Risk Student Education and Professional Standards, the only organization in the United States that provides standards for working with marginalized and nontraditional students from kindergarten through college.

**Jennifer H. Waldeck**, PhD, is a professor and associate dean in the School of Communication at Chapman University.

**Kara M. Whitman**, PhD, is an assistant professor at Washington State University in the School of the Environment. Kara is passionate about environmental education, student-centered teaching, and finding collaborative solutions for complex socio-ecological problems.



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