Chapter 1. Disciplinary Knowledge: Defining Ways of Thinking and Practicing

Writing is Never Just Writing

As instructors, it's likely that you see your job as teaching students something about your fields. These fields, though, are more than just labels that you and other instructors attach to a subject matter (history, biology, anthropology, law, business, journalism). Instead, fields are communities of intellectuals to which individual instructors feel that they belong, and to which they belong and contribute. Members of fields think through lenses that come from their own training *in* fields, because they have been educated (in graduate school or professions, in their lives as departmental citizens, and so on) to do so. This is why all instructors feel that their courses are intended in some ways to help students learn about, and learn within, fields. This is especially true of introductory courses because in those, instructors are likely trying to introduce key elements to potential majors. As students progress through courses, faculty ask them to do things with the knowledge they have been building. That "doing" includes ensuring that students can build on received knowledge, make connections between that knowledge and their identities and experiences, and even sometimes challenge the knowledge itself.

How people learn and make knowledge in fields or professions also shapes instructors' ideas about *writing* in those areas. That's because for *all* writers, writing serves three important purposes:

- First, writing helps people learn about and practice with how knowledge is made in a field. With writing, learners (or instructors) can find their ways into key ideas and learn to apply them; learners can also use writing to practice with how key ideas are intended to be presented in different types of writing in a field.
- Second, people can use writing to show what they know about those key ideas and connections between their understanding and those of others.
- Third, writing can help push the boundaries of how knowledge is created in their fields as writers bring in new ideas and even new ways of writing.

This book is about how you can teach writing in your courses and your field to help students do all of these things effectively. This book will help you work with writing and writers in research-supported ways in order to::

- teach with writing, so that students can learn about and practice with ideas;
- teach writing; so that students can demonstrate what they know in ways that your field expects; and

- teach writers, those students in your classroom, taking into account their ideas and experiences as you work with them to learn.

This book is also about how you can gain confidence regarding your teaching of writing and come to enjoy this work, seeing it not as separate from the "content" of your field but inextricably part of it and part of the expertise you already have.

To accomplish these goals, this book draws extensively on research in writing and learning. The primary focus will be on how you can study your discipline or field's knowledge-creating practices, then use writing to enable students to learn about and gain experience with those practices. We call this providing "access" to your discipline, because you are opening a portal into how the discipline or field works and the roles that writing plays in it. You'll also consider how you can create writing activities that learners can use to connect their own ideas and commitments to those knowledge-creating practices. We refer to this as providing "opportunity," because you are creating space for learners to push on knowledge-creating practices in ways that might broaden the discipline or field.

Access requires instructors to carefully study how knowledge is made (through writing), creating writing activities that help students study and practice these ways of creating. *Opportunity* requires instructors to learn what students know and bring to a course or a field, then do some reflecting on how students' ideas and commitments can build on (or even challenge) their own. These ideas of access and opportunity draw extensively on research focused on building equity that we encourage you to examine—work as foundational as that of Paolo Freire (1970), bell hooks (1994), and Gloria Ladson-Billings (2021), as well as researchers across fields who have added to their foundation of asset-based approaches such as Keivan Stassun (2011), Bryan Dewsbury (2019, 2020), Kevin Gannon (2020), and others.

This is not the only book that invites you to teach writing more effectively by analyzing expectations in your field or discipline. But it is the only book that places this examination within the context of access and opportunity, inviting you to sudy those expectations in the context of your own experience as a writer and learner and the boundaries of your field. It's also the only book that invites you to not only make these more explicit, but potentially expand your own ideas as a crucial part of equitable and socially just teaching. That's because writing is a mirror and a gate that (to adapt an idea from an important study in writing studies) "swings both ways"—writing is a process and a product that can exclude or invite students (as well as colleagues) and their ideas (Agnew & McLaughlin, 2001).

This is the power of writing: as a process and product, writing is the most obvious manifestation of work with and around creating knowledge, whether in an academic discipline, a workplace, or any other community where people share common beliefs. But it is never "just writing" (Adler-Kassner, 2017). Rather, it's also the primary way that ideas are represented. And we mean "writing" here in the most

capacious way: composing that uses letters or numbers or visuals such as maps and charts, even composing that takes the form of code. All of these are forms of *composed knowledge*, representations of what people in particular fields or areas believe, know, and do. Those ways of knowing and representing are linked to what's valued, and what's valued represents the dominant knowledge of the field.

In this chapter, you'll start to outline the boundaries of your field, the dominant knowledge and practices of your field as *you* define them, the ones that identify how your ideas are distinct from other fields/interfields. You'll also start to connect practices within those boundaries to ideas about good writing.

Goals for this chapter include:

- defining the identity of your field
- starting to name central ideas (ways of thinking and practicing) in your field
- identifying places where multiple learners get stuck
- defining characteristics associated with "good writing"

Composing Knowledge

As an instructor, you are recognized as a person with the expertise needed to teach students. You also have the authority (and privilege) to do this teaching. But one of the characteristics of expertise is that experts tend to forget that how and what they do is learned and that expertise is demonstrated through continued engagement with shared characteristics and practices (Ambrose et al., 2010; Bransford et al., 2000; National Academies of Sciences, Engineering, and Medicine, 2018). Experts also approach all of their work from particular perspectives that reflect their experiences. Experts often see their jobs as teaching students to learn to cultivate the same abilities—the same expertise—that they themselves have. But as important as this idea of learning from and within field-based expertise is, it's often not something instructors think about explicitly because the whole structure of this learning is so familiar.

In this sense, a field or discipline is analogous to what is called a "community of practice." These communities are built and sustained by members who share ideas, language, strategies for learning, and markers of "insider" status (Wenger 1998, pp. 125-126). The trajectory from novice graduate student to expert full professor illustrates a person's journey into a community of practice—that person is learning how to speak, learn, and behave "successfully" in a discipline. Experts become good at these things—engaging and making knowledge together, knowing what knowledge is "insider" and what isn't, and how to demonstrate insider status. As these characteristics of expertise become more familiar, they become what people believe to be "commonsense." But as theorist Etienne Wenger reminds us, "common sense is only commonsensical because it is sense held in common" (Wenger, 1998, p. 47)—it's not "natural."

As a faculty expert, your expertise is reflected in your expectations for writing. This chapter asks you to take a step back and think about the context where that writing is situated—your own expertise and your (inter)disciplinary context(s). This reflects an important idea that writing scholars have explored and demonstrated through empirical research: *writing is a social activity whose value is determined and reinforced by audience(s)* (Bazerman, 2015; Lunsford, 2015a). This means that whenever any writer composes, they do so with certain things in mind: purposes for the writing, audiences who might read it (even if the audience is the writer), context(s) where the writing will be used. And when that writing is valued by one or more audiences, the very act of valuing reinforces what is manifested in the writing—the ideas, the form the writing has taken, and so on. Writing in any course, any program, in any field, is a social activity that is intended to speak to purposes and audiences (even if an audience of teachers) in a context that is valued by the people who reinforce ideas of "good writing."

Exploring Your Expertise

It will be useful to work on activities in this chapter with at least one colleague, though they also can be explored independently. If you are working with a colleague, try to find someone from a field very different from your own. You'll start your exploration by identifying as many differences between your fields as possible. By doing so, you'll engage in what researchers refer to as "experience of variation," i.e., conscious and explicit identification of differences across contexts (Baillie et al., 2013). (This is contrasted with "varied experience," the unconscious experiences that people often have moving from one context to another.) Engaging in conscious experience of variation—recognizing differences from one community of practice or context to another—can emulate the experience of novice learners. This, in turn, can help you think about what you need to make explicit to students about your disciplinary context and how you can help learners develop strategies to identify disciplinary boundaries. Asking instructors to identify *differences* is much more difficult than identifying areas of similarity or overlap, but challenge yourself to do so. Avoid the more "natural" pathway toward connection. Shortly, you'll see why noticing connections is easier for you than it is for your students.

Activity 1.1 begins the process by asking you to think about how you create your expert self.

Identifying Disciplinary Understanding (and Practice)

Activity 1.1 should help you to identify some of the most visible features associated with your identity as a member of a community of practice. But the boundaries of your field are considerably more complex. That's because (consistent with the "community of practice" theoretical framework) the labels, vocabulary, and

understandings of learning within your field are manifestations of a deeper and more fundamental understanding of the field's *epistemologies*, or *ways of understanding*. Epistemologies are connected to ontologies, what people understand to be real (Roberts-Miller, 2019). Epistemologies and ontologies might seem to be a bit distanced from writing, but in fact they're integrally connected. Meaning is made within specific contexts, and shared understandings of meaning are created and reinforced when those doing and interpreting meaning-making activities (also known as "writers and readers") have the same epistemological perspectives and manifest them through practice—like the production of writing that a person perceives as "good."

On the flip side, when these epistemologies aren't shared, the perception is that meaning isn't being made. Instructors often express this mismatch by saying that a student's writing "doesn't make sense" or that what's being produced, often in writing, isn't "right." The question the writer is asking is perceived as being "off," or the evidence or data do not seem to be analyzed or incorporated correctly; the citational form seems not to follow the understood rules, or the language, style, syntax, or mechanics used feel inappropriate. But perceived inconsistencies are often the result of differences in epistemologies. Of course, not everything is relative; the point here is that many things that may feel like accepted "truth" or "common sense" are instead quite context- and value-specific. Thus, if you want to invite students into your field, you first have to make your disciplinary epistemologies explicit. Students can't access what they can't see or understand, and instructors can't teach students what they understand implicitly but struggle to make explicit.

Activity 1.1: Defining Your Expert Identity

1. How do you refer to yourself as a member of your field? (For instance: "I'm a historian," or "I am in composition and writing studies," or "I teach statistics.")
2. When you talk to someone not especially familiar with your field, what do you say that you teach students in your courses?
3. What are one or two terms that you use with colleagues in your field that you mutually understand, but that others are typically unfamiliar with? (For instance: rhetorical analysis, multivariate regression, null hypothesis.)

Two Approaches to Identify Disciplinary Epistemologies

As workshop leaders, we have found two approaches to identifying epistemologies that tend to resonate with faculty: the threshold concepts framework (Meyer & Land, 2003) and a method for identifying "learning bottlenecks" associated

with decoding the disciplines (e.g., Middendorf & Pace, 2004; Middendorf & Shopkow, 2017). Both provide possible lenses for identifying and naming what you know and do implicitly as an instructor whose identities are grounded in academic disciplines (or interdisciplines) or applied, practical fields. "Threshold concepts" help get to shared concepts that underscore participation in fields (including but not limited to ideas about what is "right" and "not right"); "learning bottlenecks" provides a way to think about where multiple students get stuck and to start unpacking why this is the case.

Threshold Concepts

Interviewing faculty at University of Durham, Jan H. F. Meyer and Ray Land recognized that in every field, there were particular ways of thinking and practice that students needed to understand in order to move into the work of the field. They called these "threshold concepts," ways of understanding that are specific to particular fields and which, once understood, influence what learners do. Meyer and Land describe the idea of "heat transfer" to illustrate a threshold concept: someone wants to cool down two identical cups of tea very quickly. They add milk to the first and wait a few minutes, then add an equal quantity of milk to the second a few minutes later. Which will be cooler? The answer is the second cup because "in the initial stages of cooling it is hotter than the first cup with the milk in it"; the steeper temperature gradient that leads to heat loss will mean faster cooling, even as the cold milk is poured into the first cup of tea (Meyer & Land, 2006, p. 4). Once home cooks grasp this concept, Meyer and Land say, it is "transformative"—they watch cooking shows differently, they choose pots and pans differently with the idea of heat transfer in mind, and so on.

The idea of threshold concepts has resonated with instructors and students in virtually every field. (There is an extensive literature on threshold concepts, a bi-annual threshold concepts conference, and seven edited collections focusing on threshold concepts theory/practice—see Mick Flanagan's excellent website for a range of examples at https://tinyurl.com/39v38vcj.) Faculty across fields have named threshold concepts like:

- Geographic and social environments dictate health behaviors and the consequences of those behaviors.
- Art historical writing involves multiple frames of interpretation and—perhaps more importantly—the ability to hold multiple frames in suspension at the same time while producing an original argument. While there is no one "right" interpretation of a work of art, there are interpretations and scholarly arguments that have more quality or staying power than others.
- Geography is literally and figuratively a worldview—exploring space, place, landscape, region, and environment—to better understand our changing planet, communicate that understanding, and apply it to decision-making.

- History consists of multiple and competing narratives.
- Musical works are produced by networks/communities of multiple actors with different things at stake.

Others are associated with actions, like this one that applies to a biology lab:

- Sterile technique is necessary because it ensures our cell cultures remain 'clean' and any experiments we do produce results just on the focal species.

To view more threshold concepts developed by faculty across disciplines, see the Disciplinary Writing Guides at Miami University's Howe Center for Writing Excellence, especially those from art history and philosophy at https://tinyurl.com/mwxaxy69. You can find also find archival versions of these guides on this book's web page at https://wac.colostate.edu/books/practice/expertise.

Scholars have identified seven features associated with threshold concepts:

- *Troublesomeness*. Threshold concepts can conflict with long-held knowledge, inert knowledge, and/or entrenched knowledge and practice.
- *Liminality.* Threshold concepts represent a "gateway" through which learners move. Meyer and Land write that a threshold concept is is a "portal, opening up a new and previously inaccessible way of thinking about something" (2006 p. 1), often (but not always) representing a change in thinking. For instance, the idea that "history consists of multiple and competing narratives" is a threshold concept; once learners step through the portal associated with this concept, they come to realize that historical narratives always reflect perspectives (and not objective "reality").
- *Recursivity*. Threshold concepts are not learned in a straightforward way, but rather in a "two steps forward, one step back" manner; the learning is ongoing and not always linear. This means that as learners move toward the portal associated with a threshold concept, they also wrestle with it.
- *Boundedness.* Threshold concepts specific to fields/disciplines. While there may be intersections between disciplinary concepts, there are also marked areas of distinction.
- *Irreversibility.* Once a learner begins to "see through" a threshold concept, it is challenging to reverse that shift.
- *Integrativeness*. Threshold concepts help learners make connections between what may have previously seemed to be unconnected ideas or phenomena.
- *Linked to expertise*. Once someone crosses through the liminal threshold of a threshold concept, it becomes increasingly challenging to remember that that concept (and epistemology) is not "natural" or "commonsensical," but linked to participation in a field (/community of practice).

For example, the idea that "writing is a social activity whose value is determined and reinforced by audience(s)" is a threshold concept of writing studies. This idea is so foundational for members of the field that to deny it—to assert,

for instance, that writing is not social, or that its value is inherent only in its production—would mark a person as well outside the field; this belief has become a form of received knowledge. The idea is not arbitrary; it comes from years of research and theory about—and experience with—writing. This threshold concept reminds all of us that ideas about what makes writing "good" are reinforced by people in communities of practice, i.e., fields. (See Adler-Kassner & Wardle, 2015).

One way for insiders to start thinking about their field's threshold concepts is to identify what those concepts are *not*. Activity 1.2 asks you to take this perspective, and then Activity 1.3 asks you to flip your thinking to identify what is "missing" in the imagined discussion that 1.2 asks you to reconstruct. (Again, be sure to compile your activity notes in one notebook as you work through this book).

Activity 1.2: ***That*** Conversation

As you travel from place x to place y, the person in the seat next to you notices something you're writing or reading. "Oh!" they say. "That looks interesting. What do you do?" You place the text down and respond, "I'm a _____", or "I teach _____" (using some of the language you identified in activity 1.1).

The person then responds with an assumption about something you think, say, or do that isn't right at all, that in fact causes an almost visceral response in you. They say, "_____."

You respond to them, trying to reframe their thinking, "Actually, that's not quite right: I _____."

To illustrate, here are some of the ways that other faculty have completed this activity:

> You: "I'm a mathematician."
>
> Conversation partner: "I bet your checkbook is always balanced."
>
> You: "Actually, math is about trying to find patterns in apparent randomness."
>
> You: "I'm in writing studies, so I teach composition."
>
> Conversation partner: "I'd better watch my grammar around you."
>
> You: "Actually, we study what and who makes writing seem 'good' in different settings. We teach students to study that, too, then choose whether and how to write in those ways."
>
> You: "I'm a historian."
>
> Conversation partner: "I loved *Hamilton* because it really showed me the truth about what an important, liberatory figure he was for all Americans."

> You: "Well, that's one interpretation of Hamilton—but it's just one. Actually, history is a set of multiple, sometimes competing, narratives about the past that can help us to try to understand historical actors/actions."

What the faculty are trying to explain in these illustrations starts to get at threshold concepts, because they speak to foundational ways of understanding, approaching, "seeing," and making meaning within their fields. Naming these foundations is key because they underscore so much of what's considered *good thinking*, and good thinking is one critical element of good writing. The examples you gave in Activity 1.2 gave hints about some of the threshold concepts of your field.

In Activity 1.3, you'll push this a bit further, focusing on concepts that are especially important for students who are just coming to your field. The grid found in Figure 1.1 can serve as a handy reminder of where to focus when thinking about teaching novices:

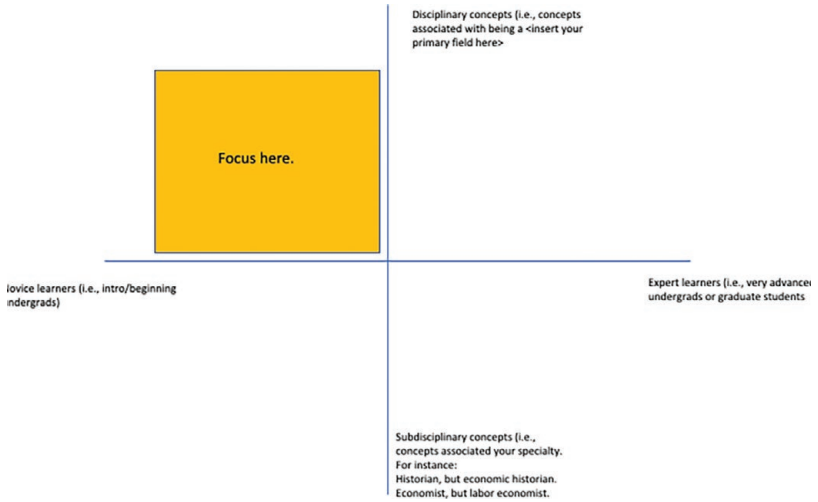

Figure 1.1. Where to focus when thinking about teaching novices.

Activity 1.3: Naming Threshold Concepts

Name one or two threshold concepts that you associate with your own field and explain why they are important for students in your course(s). One way to do this is to complete this sentence: "Sometimes, when students enter <this course>, they think it's about <an assumption students make about your field that isn't right>. But when they've really learned and explored the material, they leave thinking and acting differently. They put <this important concept or idea> into practice, which I can see when they <produce or do X or apply in this way>. Feel free to begin listing as many threshold concepts as you want to brainstorm.

Disciplinary concepts are ones that underscore the perspectives of instructors across the discipline, such as the idea that "writing is a social activity whose value is determined and reinforced by audience(s)." Subdisciplinary concepts are ones that are ones embraced by disciplinary subfields. For instance, for writing scholars with a subspecialty in technical writing, the idea that "technical communication simplifies complex information" is a subdisciplinary concept. Over time, threshold concepts must also be examined and expanded, too, so that they don't become reified knowledge that represents dominant thinking in a discipline or field (Wardle et al., 2020). For technical writers, the idea that "the translation of technical documents [and their interpreters] impacts the dynamic of . . . [translation] on specific communities" (Gonzales, 2022) expands the subdisciplinary concept; the idea that "writing only occurs within accessible conditions" (Womack, 2019, p. 26) challenges ideas of what is necessary for writing to occur.

If you can engage with other instructors from your own field during this brainstorming, so much the better. You'll find other examples of faculty who named threshold concepts and connected them to their experience of entering their academic fields in the appendix for this chapter (see https://tinyurl.com/2fhwj4je).[2] If you are interested in seeing whether people in your field have published about your threshold concepts, you can explore the clearinghouse created by Flanagan at https://tinyurl.com/39v38vcj. Once you've generated a list of possible threshold concepts, you can start identifying their implications for knowledge-making in your course(s). Specifically, you can focus on:

- what kinds of questions people in our field ask (what questions are "right" or "not right");
- what kinds of evidence or data is collected (what are the "right" and "not right" kinds of evidence or data);
- what methods should be used to evaluate what's collected ("right" and "not right" methods); and ultimately
- how what's learned should be represented ("right" and "not right" ways of writing about findings).

Chapters 2 and 3 will spend more time on each of these, but you can start making notes about your thinking now. You can also start comparing notes with someone in a field distant from your own. Sometimes the questions and methods people use seem like the kinds of questions and methods "everyone" uses. By comparing notes with someone from a different field and focusing on *differences* (not similarities), you might see that your way of thinking is distinct and specific to you and others like you.

2. In addition to linking directly to resources on the web, we provide archived versions of the materials in the appendix on this book's web page at https://wac.colostate.edu/books/practice/expertise.

In the appendix, you can find examples of how instructors from various fields have described their work, identified some of their field's threshold concepts, and considered the implications of those concepts for their teaching. For instance, a padlet created by Environmental Studies faculty member Summer Gray documents threshold concepts of that diverse interdisciplinary field for students in an upper division course, including "Infrastructure is more than physical systems; each system has a social and cultural life"; and "the design and construction of places ['the built environment'] reflect[s] social values and relationships" (see https://tinyurl.com/3uym8ddm). The padlet then links the concepts to case studies, activities in discussion sections, assignments and the final project. You can find other threshold concepts on the website for the Howe Writing Across the Curriculum Program at https://tinyurl.com/4s7m6fc8.

Faculty have created materials to walk students through threshold concepts, too. In a slide deck created by Professor erin Ninh for students in Asian American literature (see https://tinyurl.com/2p9japyr), Ninh defines "literary meaning" as a threshold concept: interrogating a passage "in pursuit of a research question and mak[ing] a case for your thesis/interpretation" by "see[ing] and fully pursuad[ing] your reader of patterns of ideas that amplify or can even overturn the facile impressions of a first/surface reading." Then, she explains how to engage in this kind of reading, using the deck as a guide for her own teaching and students' learning. And you will see in examples from philosophy instructors Gaile Pohlhause, Elaine Miller, and Keith Fennen (see https://tinyurl.com/2s4yyrjj), efforts to help students understand how threshold concepts work in philosophy, particularly in their written texts. For example:

> **Threshold Concept: Transformative/Conceptual Reading**
>
> *The statement:* The goal of reading philosophical texts is to enter into different conceptual frameworks, by following lines of reasoning and allowing them to speak to us.
>
> *What this means for students:* When reading a philosophical text, it is important to first try to understand the ideas and concepts being presented and how they make sense, instead of immediately reacting to them with criticism or judgment. Students should be open to the possibility that reading philosophical texts may activate new ways of thinking.

As another example, the Table 1.1 (excerpted from Loertscher et al., 2011), biochemistry faculty outline the threshold concept *steady state* and explain ideas that are "unlocked" for students once the threshold concept is understood, as well as connections that become visible to learners with a deep understanding of the concept. In this way, Loertscher and colleagues illustrate the ways in which threshold concepts are transformative and integrative.

Table 1.1. Threshold Concepts in Biochemistry

Name	Knowledge Statement	Biochemical ideas that are unlocked once this concept is understood	Connections that were invisible before deep understanding of the concept
Steady state	Living organisms constitute open systems, which constantly exchange matter and energy with their surroundings, yet net concentrations remain relatively constant over time. This dynamic, yet outwardly stable condition is referred to as a *steady state*.	Steady state is an emergent process that results from regulation of numerous biological reactions.	Once the condition of steady state is recognized, the purpose of complex regulatory systems in maintaining steady state and their connections to each other become apparent.
		Steady state is a metastable condition that can be maintained only because of constant input of energy from the environment.	
			Once the metastable nature of steady state is recognized, the importance of multi-tiered energy storage systems (starch, glycogen, triglycerides, etc.) becomes apparent.
	"Steady" is not synonymous with chemically "stable." Concentrations are determined by kinetic, rather than thermodynamic, factors. Hence, biological systems do not exist in a state of chemical equilibrium.		
		Steady state defines the conditions of life under which chemical reactions take place in cells and organisms. Therefore an understanding of steady state is necessary in order to correctly contextualize all of biochemistry.	

Name	Knowledge Statement	Biochemical ideas that are unlocked once this concept is understood	Connections that were invisible before deep understanding of the concept
	If an organism reaches chemical equilibrium, its life ceases. Consequently, organisms have evolved extensive regulatory systems for maintaining steady-state conditions.		

Source: Loertscher, J. (2011) Threshold concepts in biochemistry. Biochemistry and Molecular Biology Education, 39(1), 56-57.

Threshold concepts can be a useful lens through which instructors study their own disciplinary practices. For many instructors, the very idea of defining these concepts is transformative—as one faculty member put it, "threshold concepts are a threshold concept" (Adler-Kassner & Majewski, 2015). Since these concepts become lenses that instructors (or practitioners in any field) "see through and see with," they are integrally linked to ideas of what makes writing "good."

Decoding the Disciplines/Learning Bottlenecks

Some faculty find it difficult to identify threshold concepts without more extended thinking and conversation and prefer instead to identify "learning bottlenecks," an idea that comes from an approach called "decoding the disciplines" (or DtD). Joan Middendorf, David Pace, and Leah Shopkow, instructors at Indiana University, developed this approach after working with faculty teaching first year seminars there (Middendorf & Pace, 2004; Middendorf & Shopkow, 2018; Pace 2017). Middendorf and Pace (2004) realized that faculty frustrations over student learning could be understood to occur around these bottlenecks, places where students repeatedly got stuck. Studying these bottlenecks, the researchers and their faculty colleagues identified them as places where students were asked to participate in disciplinary concepts (ideas that also could be labeled threshold concepts) and knowledge-making in ways that were not knowledge in general but *particular to a field*. To work through these bottlenecks, Middendorf and Pace (2004) developed a recursive seven-step process for faculty to "decode the[ir] discipline for students." This process starts with defining those bottlenecks, then uncovering "mental tasks that experts [faculty] use to work through them" (https://decodingthedisciplines.org). Activity 1.4 works from the DtD perspective.

Activity 1.4: Identifying Learning Bottlenecks

Focusing on a single course that you teach, write ~100–300 words that describe a moment or conceptual action where the majority of your students seem to struggle, a place where things frequently don't go as you think that they should. As you write your description, be as specific as possible. The DtD website provides some examples of how to do this well:

> **English**
>
> *Vague description of the bottleneck:* Students cannot interpret texts.
>
> *More useful description of the bottleneck:* Students struggle with textual interpretation. They want to "interpret[] without first getting a grasp of a text's content. They need to observe before they interpret…." (Ardizzonne et al., 2004a).
>
> **Biology**
>
> *Vague description of bottleneck:* Students have difficulty moving from fact learning to a deeper understanding of biological processes.
>
> *More useful description of the bottleneck:* "Students have difficulty visualizing chromosomes, appreciating the distinction between similar and identical chromosomes (i.e., homologs and sister chromatids), and predicting their segregation patterns during mitosis and meiosis." (Zolan et al., 2004, p. 24)

1. In your written description of where your students struggle, circle the key terms or concepts associated with the bottleneck you've identified. In the illustration from English above, for instance, these might include *interpretation* and *observation*.
2. Write for yourself what you mean when you employ these terms. What does it mean to *interpret* a text? What about to *observe?* Literature faculty member Jim Kearney, for instance, often employs the metaphors of "text as artifact" (something to be observed) and "text as machine" (something that creates meaning that readers can interpret) (Adler-Kassner & Majewski, 2015, np).

As the examples in Activity 1.4 demonstrate, less helpful explanations do not take into account the ways that experts approach and understand key terms. More helpful explanations, on the other hand, take those terms apart and lay them out carefully—they "decode" the meanings that are implicit in disciplinary terminology. Instructors have also sometimes identified learning bottlenecks, as in the example of learning bottlenecks found in the appendix for this chapter (see https://tinyurl.com/2r9ha627). Shopkow (2010), one of the principal investigators of the DtD project, suggests that DtD can "facilitate the application" of thresh-

old concepts for faculty, since it uses instructors' knowledge-making processes around those concepts as a "launching pad" to investigate how people solve learning bottlenecks and provides a "methodology [that includes] shared vocabulary of goals and techniques that can encourage institutional change needed to guide students through a process… while also providing the basis for fruitful conversation and collaboration among faculty" (p. 318). You can also find an extensive list of research using the DtD framework on their website (http://decodingthedisciplines.org/bibliography/).

Implications for Writing

Once you've started to identify threshold concepts or learning bottlenecks, you can start making connections to characteristics associated with "good writing." This is the focus of Chapter 2, but you can prepare for that chapter by studying the work of a successful learner in one of your own courses.

To complete Activity 1.5, you'll need to find a piece of student writing produced in one of your courses that you think is really good. You'll use this student work as the basis to describe characteristics associated with good student learning as they are manifested in that student's writing. *It really is critical that you use an actual piece of student work (that you can look at), rather than your memory of that work.* That's because grounding your analysis in text can provide you with much more concrete, specific, and usable evidence or data.

Activity 1.5: Describing Successful Writing

Begin by creating a three-column chart. Focus on a short excerpt from the piece of student learning that illustrates why you find it successful. (This could be one to three paragraphs of a piece of writing, a series of responses to a multiple choice test, or a particularly effective portion of a creative work.) Then, complete the chart below.

Describe: what makes this successful?	Reflect: What did the student need to know about and know how to do to create this piece of writing?	How does this writer's work reflect their acumen with a threshold concept or their ability to overcome a learning bottleneck?

Completing Activity 1.5 should help you to make connections across field-specific epistemologies, ontologies, and characteristics that you associate with good writing. Ideally, this will also help you to begin naming those connections so that you can share them with students. Activity 1.6 asks you to put those connections

in "student-friendly" language.

Activity 1.6: Introducing Your Field to Students

Pick one course you teach that you see as central to introducing students to the knowledge of your field. Drawing on everything you have thought about in this chapter, write one paragraph addressed to students in that course in which you explain to them:

- The foundational element of disciplinary knowledge/threshold concept that you will focus on in this class.
- How those will be fostered through class structure, curriculum, assignments, activities, etc.
- How they will engage in both learning about and learning how (declarative and procedural knowledge) as they move through the course.

These activities should help you to start identifying elements of expert knowledge associated with "good writing," and then to make those elements explicit for your students, as in these syllabus excerpts:

> **Feminist Studies 20 (Laury Oaks and Catherine McGillveray) Introduction to Feminist Studies**
>
> This course offers an introduction to central concepts and issues in Feminist Studies, a department in the Division of Social Sciences at UCSB. Our readings explore the construction of gender and sexuality and the lives of diverse individuals and communities in the contemporary US within a global context. We will focus on the threshold concepts of gender, privilege and oppression, intersectionality, and feminist praxis. Students will learn how to understand these concepts within Feminist Studies, other fields, and outside the classroom.
>
> **Political Science 15 (Heather Stoll) – Introduction to Research in Political Science**
>
> This course is an introduction to research in political science. Its goal is to familiarize you with the social scientific study of politics. We will learn how to take a scientific approach to questions about political phenomena instead of the more familiar advocacy approach taken by politicians, interest groups, and lobbyists. In other words, we will learn how to ask empirical questions about the political world; how to answer these questions scientifically using the appropriate types of evidence; and how to clearly convey our arguments, evidence, and conclusions to others.

Access and Opportunity: Disciplinary Knowledge, Disciplinary Boundaries, and Inclusive Teaching

Activities in this chapter have focused on helping you identify elements of your expert knowledge, concepts, and practices. These underscore what you consider to be "good" writing and thinking. Forefronting these ideas helps create *access* for students in your courses. At the same time, Cathy Davidson (2019) argues tha,t when faculty work with students to learn in their fields, "We are passing on value systems as well as implicit bias" (p. 7). Threshold concepts reflect field-specific ideologies, cultures, identities, and experiences. In the United States, an examination of the constitution of academic fields shows that many of the faculty that have built those fields have identities that are read as primarily male and often white, unless one is focusing on a field that was constructed explicitly as a counter-narrative (such as Chicanx, Black, Asian, or feminist/gender studies). Most faculty have earned terminal degrees, and even those who do not have terminal degrees have demonstrated that they understand the field sufficiently to teach courses in it. Many faculty are also expected to contribute to research in the field, submitting to peer-reviewed conferences and publications. All of this work enacts and extends disciplinary knowledge, often through writing.

What happens when others with different values, ideologies, and ideas enter those communities? How can faculty consider the idea of field-specific boundaries *and* expand them to make room for others? One of the ways that people learn in any situation is to build connections between their prior knowledge and experiences as they enter new and different contexts. Your courses, especially at the introductory level, are intended to introduce learners to some of those elements of knowledge in your discipline or field.

That's why faculty need to foster *opportunity* in addition to access. Opportunity is created when we make room for others to bring their identities and experiences to a new community—maybe even pushing on boundaries based on those identities and experiences. Opportunity often means that faculty give something up to make room for others' ideas, too. The idea that faculty may need to do this can itself be a threshold concept. Making space for opportunity can be especially troublesome because of the disciplinary enculturation that all faculty experience.

We'll come back to these two terms, *access* and *opportunity*, frequently in this book. Providing both requires faculty to recall that *writing is a social activity whose value is determined and reinforced by audience(s),* starting to think about what's valued and what audiences faculty are thinking of (and reinforcing) in writing assignments. Faculty can ask: whose cultures and identities am I prioritizing here? Whose cultures and identities might be excluded? Taking time to consider these questions helps to make clear the choices that you are making when asking students to write, and considering these choices can be an important step toward building opportunity.

Conclusion

This chapter has introduced the idea that composed knowledge, aka writing, reflects epistemologies that circulate within courses and fields. It has suggested that these sites are communities of practice, sites where people learn to participate in particular languages, values, cultures, and strategies for learning how to learn. Before faculty can compose and teach writing in effective and inclusive ways, they must first examine their own disciplinary identities and start to make their assumptions about knowledge-making practices explicit, and then begin connecting those assumptions to their ideas about what makes writing "good." This is because writing is a social activity whose value is determined and reinforced by audiences; the things that make writing in one place or another "good" are determined to be so because the people who produce and use that writing have reinforced ideas about "goodness" associated with writing practices. These ideas about goodness are extensions of concepts that form "windows" bordering ideas about what is good and right within the community more broadly—the questions that are asked and not asked, the evidence or data collected or not, the ways of writing that are appropriate and not.

This chapter has also emphasized that faculty should identify and make the constituent elements of expertise (as they relate to writing) explicit, which is necessary for providing disciplinary *access* to students. These practices reify existing values of a field, and thus perpetuate existing biases. For this reason, making space for opportunity is also necessary if instructors want to invite students into their communities of practice. Faculty create disciplinary opportunity by intentionally designing ways for students to bring their identities, knowledges, and languages to courses and fields.

Chapter 2 will focus in greater detail on how you can begin the process of providing access by creating ways for students to study and practice with writing in your field. This study is an important first step for students to participate and challenge language practices, as well.

Preparing for Chapter 2

Activity 2.1: Writing Log

Before you begin Chapter 2, keep a *daily writing log*: For two days, start a two-column writing log. In column 1, record everything you write, large and small, formal and informal. In column 2, note purpose/audience for each piece of writing. You will use this log for various activities in Chapter 2.