Teaching Transferable Skills Using a Sociocultural Perspective:

A guide for faculty and institutions for creating college courses that highlight disciplinary knowledge, professional norms, and habits of mind

Matthew T. Hora, Education Policy Studies (SoE) &
Liberal Arts/Applied Studied (DCS)

CCWT
CENTER FOR RESEARCH ON
College-Workforce Transitions

WISCONSIN
UNIVERSITY OF WISCONSIN-MADISON

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Table of Contents

INTRODUCTION

We are in a moment in the early 21st century where higher education in both the U.S. and around the world is increasingly focused on students' post-graduate success in the labor market, or what some call "career readiness." This focus is sparking conversations about credentials, artificial intelligence (AI), career pathways, "hot" new jobs, and whether certain skills are being taught in college – competencies popularly known as soft, non-cognitive, social-emotional, or transferable[1] skills (e.g., critical thinking, communication, teamwork). Increased attention to transferable skills is an immensely positive development, as students will need these competencies to not only thrive in the rapidly changing world of work, but also to properly address problems facing society such as rampant misinformation, a climate emergency, and dizzying technological advances.

> *"Attention to transferable skills is critical, as students need these competencies to thrive in the workplace and to address social, political, and environmental problems.*

But the higher education sector is not well prepared to teach students transferable skills, largely because faculty[2] are too often not trained in how to teach and design a course, much less the more challenging task of teaching complex skills like critical thinking or teamwork. While faculty professional development (PD) is becoming more common, many focus on technique alone (e.g., active learning, inclusive pedagogy) without addressing the problem of skills development, or rely on overly brief one-time workshops on "teaching soft skills." While some promising examples of robust skills-oriented faculty PD do exist, they are limited by the dominant discourse of skills as generic, de-contextualized "competencies" or "soft skills." This generic perspective is most evident in influential lists such as the NACE Career Competencies or the AAC&U's Essential Learning Outcomes (ELOs) - where complex transferable skills such as communication are unfortunately reduced to descriptors such as, "clearly and effectively exchange information, ideas, facts, and perspectives."

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[1] While it is preferable to avoid umbrella terms to categorize these skills and to speak of them in terms of individual competencies, in some cases it is useful to refer to these skills in the aggregate. For the rest of this guide, I use the term "transferable" to refer to knowledge-driven abilities to perform tasks (i.e., skills) as it is recognized in the field of the learning sciences and captures how some (but definitely not all) of these aptitudes can be used across situations and contexts.

[2] The term "faculty" is used to refer to all people – whether full- or part-time, tenure-track or non-tenure-track – who hold positions that involve teaching courses within a college or university. Sometimes the term "instructor" is also used.

However, this definition and interpretation of skill or human competency is at odds with considerable multi-disciplinary evidence on the situated, culturally bound, and content-driven nature of "skills" and how they are best learnt or developed. Both common sense and extensive research on skill utilization in real-world settings such as engineering firms (e.g., Darling & Dannels, 2003), health care organizations (e.g., Hora et al., 2019), photonics laboratories (e.g., Leak et al. 2018), domestic settings (e.g., Rogoff, 2014), and K-12 students' use of mathematics (Nasir et al., 2008), demonstrate how these generic or domain-general accounts of skill fail to capture how skills-in-practice are inextricably bound to disciplinary knowledge in specific geographic, professional, and socio-cultural settings. According to this interdisciplinary literature, while transferable skills do contain some universal or domain-general characteristics (e.g., clear exchange of information), in their real-world use they are highly contextualized competencies informed by discipline- or domain-specific knowledge, situations, norms, and behaviors.

> *"But higher education's ability to teach these skills in a rigorous manner is inhibited by faculty training and the dominant "generic skills" discourse.*

> *"Instead of generic "soft skills" or "competencies" transferable skills are content-driven cultural acts, behaviors, or habits of mind unique to specific disciplines and task situations.*

In other words, transferable skills are better thought of as content-driven cultural acts, behaviors, or "habits of mind"[3] that are specific to the unique professional worlds of the engineering, medical, educational, and other professional workplaces that our students seek entry to upon graduation. What are the implications of this cultural and research-based account of transferable skills for teaching and learning in our colleges and universities?

First and perhaps most important, the generic conception of skills must be rejected in favor of the content-, context-, and culture-centered perspectives that are grounded in the research literature. This is important not only for more effective faculty PD, but also to address the prospect that how educators define what constitutes "good" or "appropriate" forms of communication or teamwork may (un)intentionally reify and perpetuate normative perspectives that encode sexist, racist, ableist or other discriminatory views (see Moss & Tilly, 1996) – an issue that is currently ignored[4].

[3] While "habits of mind" is the name of a curricular movement in the 1990s in K-12 schools similar to character education (see Costa & Kallick, 2005), the term here builds on the ideas of Dewey (1910) and Bourdieu (see Lizardo, 2004) who emphasize habituated cognitive processes of thinking, acting, and reasoning that are deeply internalized through years of socialization and learning.

[4] Despite ongoing attempts to assert that the U.S. is a true meritocracy with no historic or current instances of discrimination (either structural or individual) on the basis of social class, race, gender, or other attributes regarding access to jobs, educational opportunities, or other vehicles for mobility, the empirical evidence from multiple disciplines proves this claim to be false. Just on the point of hiring discrimination, the evidence unequivocally shows that employers discriminate on the basis of age, disability status, physical attractiveness, race, gender, and other attributes (see Lippens et al., 2023; Quillian et al., 2017). The fact that hiring decisions are often made on the basis of subjective judgments about "soft" skills or "cultural fit" highlights the possibility that how we define and evaluate these attributes can (explicitly or implicitly) act as discriminatory filters to hiring decisions.

> *Effective transferable skills instruction is not solely using an active learning technique but should follow the sociocultural learning sequence of lecturing, modeling, practicing, and feedback.*

Second, teaching transferable skills should be viewed as a complex pedagogical task akin to introducing young people or novices to a new way of thinking and acting in a new sport, profession, or culture. Consider the challenge of preparing someone to live and work in Japan who has no experience or knowledge about Japanese culture. It would take knowledge of cultural norms (e.g., bowing in different situations), demonstration or modeling of these behaviors, hands-on practice, and ideally some critical feedback from an expert. The same problem exists in academic settings as we strive to prepare students for entry into new occupational cultures and situations, and the disciplinary knowledge, habits of mind, and professional norms that will be required for them to thrive in their careers. Learning such complex cultural knowledge cannot be done in a single lecture or workshop but instead requires what I call the *sociocultural learning sequence* – a research-based approach to learning transferable skills that involves carefully scaffolded steps of lecturing, modeling, practicing, and feedback.

Third, this situated and cultural view of skills requires a deep re-thinking of a typical lesson plan, course assignment, or syllabus, where content knowledge and not transferable skills mastery is often the primary learning goal. Instead, in the spirit of the "backwards design" approach (Wiggins & McTighe, 2005), a transferable skills learning goal (which also includes content mastery) should inform all subsequent curricular and instructional decisions. This curricular alignment means that a "through-line" or a coherent connection among the skills learning goals, teaching methods, and any assessments or assignments is clear to students and future instructors. Revising your curricula in this fashion is a key goal of this teaching guide.

Finally, we must consider the types of change or reform agendas that are most effective for leading faculty to alter how they design and teach their courses - outcomes that research shows are rarely achieved when policymakers and/or administrators adopt a top-down change model that ignores local conditions and teacher autonomy (Kezar, 2018). This is especially the case in higher education, where disciplinary expertise (and identity) is particularly strong, and where workplace conditions and job security have deteriorated in recent years. Thus, efforts to affect improvements in skills-focused instruction need to pay close attention to principles of effective faculty PD (e.g., adapting new techniques to local constraints, cohort-based models, collaborative planning).

In this teaching guide I build upon a multidisciplinary body of research evidence and 18 years of studying these issues, running faculty development programs, and teaching in a university[5] to offer a new, pragmatic approach for thinking about "skills" and how to best guide faculty towards embedding them into their courses. From the empirical literature and my own experience, I have

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derived several key principles that inform the strategy outlined in this guide, which can be applied to various forms of faculty PD that you and your institution may be considering – faculty self-study, facilitated workshops (i.e., at conferences or on a single campus), or consultant-led interventions.

Key principles for teaching transferable skills from a sociocultural perspective

1. Reject the generic skills approach and instead articulate content-, context-, and culture-specific versions of key transferable skills.
2. Use discipline- and task-specific transferable skills as the foundation for revising individual assignments, lesson plans, and/or classroom activities (i.e., backwards design).
3. Teach skills using "lecture-modeling-practice-feedback" sequence appropriate for learning new professional norms, practices, and habits of mind as sociocultural behaviors.
4. Start small! Aim to revise or create individual lessons and/or assignments instead of trying to overhaul an entire syllabus or create national skills benchmarking systems.
5. Carefully design faculty development programs using research-based principles (i.e., content-focused, curriculum re-design, contextualized, community, critical reflection, and collaboration) while prioritizing faculty autonomy.
6. Use a big-tent approach when describing skills-related teaching and learning to students and campus stakeholders – highlighting the value of transferable skills for civic engagement, intellectual growth, and career readiness.

Part I of this guide provides a landscape scan of efforts in higher education regarding skills-focused instruction (i.e., current initiatives, critiques, and relevant research evidence), which is important for understanding the "state of the art" in today's postsecondary sector. **Part II** includes an in-depth review of the key principles informing the new disciplinary and cultural zapproach to teaching transferable skills and student learning outlined in this guide. Finally, **Part III** of the guide includes a detailed analysis of the concrete action steps that you or your organization can take to improve skills-focused teaching and learning. These 7 steps are customizable to your own institutional, disciplinary, and classroom conditions and cultures, and are outlined in Table 1.

Table 1. The 7 steps for teaching transferable skills using a sociocultural perspective

Logistics & Preparatory Phase
Step 1: Convene key stakeholders & discuss guiding principles and logistics of the work.
Faculty Reflection & Initial Revisions Phase
Step 2: Select course to focus on for all subsequent revisions.
Step 3: Identify desirable disciplinary skills relevant to course and articulate how the skill is used in the real world in detail.
Step 4: Identify course component to revise based on: (a) situational constraints of instructor time and curricular flexibility, and (b) lesson or assignment most aligned with targeted disciplinary skills. Start small instead of attempting to revise an entire syllabus all at once!
Step 5: Revise selected course component to highlight disciplinary skills through use of sociocultural learning sequence (i.e., lecture, modeling, practice, feedback).
Curricular Revision Phase
Step 6: Update course materials (e.g., syllabus, lesson plans, lecture slides) with new skills-focused changes

What this guide is

This guide is an evidence-based approach to help faculty or PD professionals revise existing (or create new) course activities, lesson or unit plans, or assignments so that they provide students with robust opportunities for learning key skills (e.g., critical thinking) within specific disciplinary contexts and cultures.

This guide views "skills" as complex socio-cultural habits of mind and behavior, learned through socialization in particular groups (e.g., peers, family, professional colleagues) and in specific times and places.

This guide is based on empirical research from the learning sciences, educational reform, anthropology, sociology, organizational development, and instructional design. The ideas and strategies in the guide are also grounded in the author's 18 years of experience as a researcher of faculty development and skills-focused instruction, and especially insights from teaching over 250 faculty members to embed skills into their curriculum and instruction.

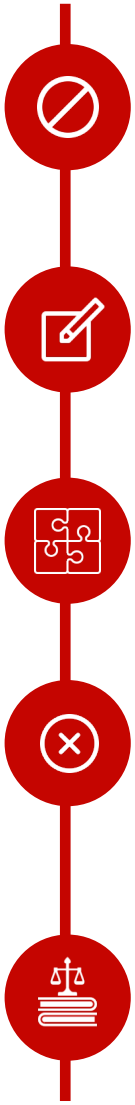
This guide is a flexible set of ideas and planning tools that can (and should) be customized to fit the unique conditions and constraints of your institution, department, and profession.

This guide represents a framework for change that can be used by faculty working alone or in groups, departments, faculty developers, or organizations engaged in facilitating teaching reform or improvement.

This guide is attentive to problems in the higher education sector that directly impact student learning—faculty overwork, limited departmental resources, continual top-down mandates for change—and attempts to foster positive change within these constraints instead of ignoring them, as is too often the case with educational reform.

This guide adopts a broad view of the purposes of higher education—advancing democracy, generating scientific knowledge, intellectual and moral development, and career readiness—and is skeptical of the current dominant framing that prioritizes "career readiness" and "return on investment."

What this guide is not



This guide is not a prescriptive list of teaching methods or instructional recipes for how faculty should teach or plan their courses—an approach too common in educational reform, where a single technique, program, or idea is advocated or sold as a magic-bullet panacea to student learning or post-graduate success.

This guide does not require an overhaul of entire syllabi or program curricula but instead provides instructors with flexible guidelines for revising or tweaking existing activities as part of a "start small" approach to instructional reform that is attentive to limited instructor bandwidth.

This guide does not advocate for creating stand-alone career competencies or career readiness courses or modules but instead focuses on embedding key skills into disciplinary content-driven courses, lessons, and activities.

This guide is not part of a branded organizational advocacy program or a for-profit vendor's portfolio of services—it is the work of an independent scholar committed to intellectual rigor, faculty and student well-being, and instructional excellence.

This approach does not adopt the discourses of "career readiness" or "return on investment" currently prevalent in higher education but instead frames key competencies and the purpose of post-secondary education in terms of civic engagement, scientific advancement within the disciplines, and preparing students to address the daunting social, political, and ecological challenges facing them in the mid-21st century.

CURRENT APPROACHES, CRITIQUES & RESEARCH ON SKILLS-BASED TEACHING EFFORTS

Efforts to incorporate skills-focused teaching and learning into college classrooms are not occurring in a vacuum but instead are emerging in a specific cultural, historical, and political moment in higher education. In this section, I briefly review some of the broader trends and issues shaping debates and campus-based strategies on transferable skills, with a focus on what the empirical research says about these topics.

This emphasis on evidence, science, and data is critical, as the postsecondary sector is well known for embracing new fads and trends that are hoisted upon faculty and front-line staff without robust evidence supporting new policies and practices (e.g., Birnbaum, 2000). Instead, the design and especially the revision of academic programs and curricula should be grounded in solid evidence, as is exemplified by the "What Works" clearinghouse hosted by the Institute for Education Sciences and the broader interdisciplinary evidence-based practice movement. To evaluate the rigor and efficacy of current efforts, however, requires a basic understanding of the landscape of skills-focused initiatives, and especially the implications of strengths and weaknesses of the empirical research literature for instructional reform and faculty PD.

Promulgation of generic skills/competences to inform teaching, advising, and research

Status: At the center of many current skills-related initiatives is the conception of human skill or competency as a generic and de-contextualized aptitude, in contrast to perspectives that view

skills (especially in real-world applications) as being inextricably linked to content, contexts, and culture. The generic conception is currently the dominant view of transferable skills in higher education and is driving most skills-related efforts in career advising, skills assessment, and teaching improvement.

> *"The conception of human skill as generic and de-contextualized aptitudes is informing the majority of skills-related efforts in career advising, skills assessment, and teaching improvement.*

The popularization of the generic approach can be traced to two sources. First, a 1972 U.S. Army training conference on how "soft skills" could be best taught and evaluated for military personnel, particularly key attributes such as leadership and supervision. The attendees at this conference attempted to categorize common workplace tasks (e.g., interprets and uses a military map) as "hard" or "soft" depending on their importance, degree of interaction with a machine, degree of specificity of behavior as generic (e.g., motivating troops) or specific (e.g., changing oil for specific model of a Jeep), and nature of on-the-job situations (i.e., established where all task parameters were known, or emergent where conditions and consequences were variable). The attendees ultimately concluded that no distinction could be made among real-world tasks using the binary categorization of "hard" or "soft" skills and that the term "soft skills should be eliminated" (U.S. Continental Army Command, 1973, p. II-53). However, the phrase became widely adopted in government, academia, and the media to refer to a class of skills that are generally viewed as the antithesis to disciplinary or "technical" content (e.g., knowledge of organic chemistry), pertaining to easy-to-learn subjects (e.g., "soft" sciences such as education or sociology), and revolve around inter- or intra-personal phenomena (e.g., communication, critical thinking).

> *"The developers of the first generic notion of skill (i.e., soft skills) concluded in 1972 that the idea was without merit and should be eliminated due to its lack of attention to task contexts and content knowledge.*

The second source of the generic skills approach is the ubiquitous list of transferable skills that employers desire in college graduates. Concerns regarding the poor preparation of the U.S. workforce became prominent in the 1980s with the report "A Nation at Risk" (National Commission on Excellence in Education, 1983) and subsequent studies on the skills that employers felt were critical for graduates and new employees (for an early version see Carnevale et al., 1988). The 1990s then saw a huge increase of interdisciplinary research and surveys by education-related associations (e.g., AAC&U, NACE) about on employers' skill needs and perspectives. These studies and surveys often focused on lists of generic skills (e.g., teamwork, communication) that

employers ranked in order of importance, and which were variously named "soft skills," "transferable," "non-cognitive," "21st-century," "durable," or "employability" skills. Examples of this generic view of skills are included in Table 2.

Table 2. Examples of generic skills list approaches

	Generic Skill	Definition	Sample Behaviors
NACE Competencies	Communication	Clearly and effectively exchange information, ideas, facts, and perspectives with persons inside and outside of an organization.	Employ active listening, persuasion, and influencing skills.
	Critical Thinking	Identify and respond to needs based upon an understanding of situational context and logical analysis of relevant information.	Make decisions and solve problems using sound, inclusive reasoning and judgment.
	Teamwork	Build and maintain collaborative relationships to work effectively toward common goals, while appreciating diverse viewpoints and shared responsibilities.	Be accountable for individual and team responsibilities and deliverables.
	Skill	**Definition**	**Sample Metric (High Proficiency)**
AAC&U Essential Learning Outcomes (VALUE Rubrics)	Oral Communication	A prepared, purposeful presentation designed to increase knowledge, to foster understanding, or to promote change in the listeners' attitudes, values, beliefs or behaviors.	Language in presentation is appropriate to the audience.
	Critical Thinking	A habit of mind characterized by the comprehensive exploration of issues, ideas, artifacts, and events before accepting or formulating an opinion or conclusion.	Specific position (e.g., thesis) is imaginative, considering the complexities of an issue.
	Teamwork	Behaviors under the control of individual team members (e.g., effort they put into team tasks)	Helps the team move forward by articulating the merits of alternative ideas or proposals.

As previously stated, such generic conceptions of human competency are dominating the discourse (and campus-based practices) on skills-related career advising, instructional reform, and assessment and evaluation initiatives. In some cases, this approach is also being promulgated far beyond individual campuses, with some organizations striving to establish universal assessment tools for generic skills performance (e.g., VALUE Rubrics, NACE Competency Assessment Tool), national databases of students' generic skill levels that can be organized by academic and demographic (e.g., race and gender) characteristics, and faculty PD and online learning modules for students focused on generic skills development offered by for-profit vendors.

Critiques and questions: The generic skills approach has been widely critiqued for decades on many grounds – terminological confusion and ambiguity (National Research Council, 2012), questionable conceptual and ecological validity (Holmes, 2013), for encoding neoliberal (Moreau & Leathwood, 2006) and even discriminatory (Kirchgasler, 2018; Moss & Tilly, 1996) ideologies, for oversimplifying the forces that impact student employment prospects (Hora et al., 2018; Tomlinson, 2017), and for improperly reducing the complexity of human behavior to individual generic skills (Urciouli, 2008) - but here we briefly focus on three critiques especially relevant to teaching and learning – ignoring the critical roles of content, context, and culture.

> *According to the National Research Council (2012) the key unit of analysis for transferable skills is procedural knowledge of how, why, and when to apply content knowledge to a situation.*

The first issue is arguably the most critical, and that is how discussing "skills" – or the "ability to use one's knowledge effectively and readily in execution or performance" – with no attention to disciplinary knowledge reflects a fundamental misunderstanding and misrepresentation of the nature of human skill and competency itself (Merriam-Webster, 2024). This problem of discussing generic skills outside of the specific disciplinary knowledge domain that provides critical information for skilled task performance was highlighted over 50 years ago by the originators of the "soft skills" idea (U.S. Continental Army Command, 1973), and again in 2012 in the influential evidence-based National Research Council study on "Education for life and work" (NRC, 2012). In fact, the NRC argues that the appropriate unit of analysis – which they call "21st century competencies" – is content knowledge *and* "procedural knowledge of how, why, and when to apply this knowledge" to solve real-world problems (p. 23). According to this view, critical thinking must involve a specific knowledge referent, issue or topic (e.g., whether health care should be free, trouble-shooting a broken Jeep transmission) to draw upon, and as an abstract notion has little value when it comes to teaching and training for real-world applications. Unfortunately, such a conception of knowledge-driven abilities to perform tasks, which is purportedly the primary goal of career-focused teaching and learning, is absent in the generic formulation of transferable skills and competencies.

Skill noun

a: The ability to use one's knowledge effectively and readily in execution or performance.

The second critique is that in ignoring the specific contexts in which skills enactment takes place in the real-world, the generic skills approach not only mispresents how skills function but also conveys the mistaken notion that they are best learnt in abstract, generic terms. One of the key findings of the 1972 soft skills conference was that most workplace tasks did not take place in situations that were known or predictable, but that task parameters and contexts were almost universally emergent and ill-defined (U.S. Continental Army Command, 1973). This mattered because while some basic principles of leadership or supervision could be abstracted (and thus taught), it was more effective to discuss and teach these skills as they unfolded in specific geographic, socio-cultural, and professional contexts. The situated nature of skill and task performance was also documented by cognitive psychologists in the 1980s and 1990s, where scholars contended that cognition was not solely an "in the head" phenomena but drew upon and was enmeshed with local material, socio-cultural, and historical contexts (Greeno, 1998; Lave & Wenger, 1991). A similar argument was advance by critics of Communication across the Curriculum (CxC), who argued that skills like communication were inherently situated in specific disciplinary contexts, and thus should be taught in terms of unique "genres" or authentic communication events (e.g., Dannels, 2001).

> *The generic skills approach has also been criticized for ignoring the variability in how skills are defined, valued, enacted, and interpreted according to cultural identity and context.*

Finally, the generic skills approach has been criticized for ignoring the variability in how skills are defined, valued, enacted, and interpreted according to cultural identity and context. The emphasis on culture highlights how skills as habits of mind are deeply internalized ways of thinking, acting, and reasoning that people learn from their families, peers, and communities over time (see Dewey, 2010; Lizardo, 2004). But a culture view also draws attention to the prospect that racist, sexist, and other discriminatory views can be encoded in people's normative views of "good" skills in general but especially for particular identity groups (e.g., Hora, 2020; Moss & Tilly, 1996). Further, studies of intercultural skills use that have documented variation in teamwork (e.g., Dunkel & Meierewert, 2004), oral communication (e.g., Verma et al., 2016) and even critical thinking skills (e.g., Lun et al., 2010) by ethnic communities and national identities. These findings are consistent with sociocultural theories of learning which similarly argue that learning itself is not a context-independent matter of memorizing information

but is an inherently social process deeply shaped by the unique geographic location, cultural norms, social class, and technological contexts in which information is shared and internalized (e.g., Rogoff, 2014; Lave, 1996). Unfortunately, the generic skills perspective and aforementioned skills lists are completely silent on these issues of cultural variability and the potential for reifying discriminatory norms.

Research evidence: A voluminous interdisciplinary body of research exists that uses the generic skills approach. Much of the literature is comprised of studies where students, faculty, and/or employers are surveyed about the skills they consider most important (e.g., Rhew et al., 2019), or what Holmes (2013) called the "skills list" approach in research on graduate employability. Similarly, non-academic surveys conducted by professional associations such as the AAC&U or NACE produce annual reports on skills that employers seek which are arguably more influential than studies in peer-reviewed journals on the topic. In addition to these "skills list" studies, scholars also use the generic skills approach in labor market analyses (e.g., Heckman & Kautz, 2012), where skills themselves may not even be directly measured but have proxy indicators such as high school membership in clubs standing in for generic "social skills" (e.g., Deming, 2017). Research that critiques the generic approach is outlined in the sections above, and studies that document how generic skills are not consistent with real-world practice are the subject of the section below.

Focus on discipline-specific skills/ competencies to inform teaching, advising, and research

Status: In contrast to the generic conception of transferable skills, some disciplines have long viewed these competencies in terms of discipline- or profession-specific knowledge and situations. In these cases, terms such as "soft" skills or discipline-independent definitions of "communication" are rarely seen, but instead more fine-grained descriptors of content-linked aptitudes are used. For instance, to guide accreditation processes in engineering pertaining to student outcomes, ABET specifies this communication-related criteria strictly in terms of technical engineering knowledge and contexts: "An ability to apply written, oral, and graphical communication in broadly-defined technical and non-technical environments; and an ability to identify and use appropriate technical literature" (ABET, 2022).

Similar specificity and attention to content, context, and in some cases culture, can be seen in medical education, STEM education, communication studies, and language for specific purposes (i.e., ESL), all of which are being used to guide faculty development and student readiness efforts in these fields. For instance, research has been conducted on problem-solving skills in the photonics (i.e., physics of light) workplace (Leak et al, 2018), on teamwork and oral communication skills in health care settings (Hora et al, 2022), and on teamwork in engineering firms (Darling & Dannels, 2003). As individuals are exposed to these routinized norms for performing tasks in different settings, they become internalized into our cognitive architecture and habituated as "scripts" (Abelson, 1981), which then becomes a building block of cultural

variation within the professions. For specific examples of what skills in these studies look like in practice see Table 3 below.

Table 3: Examples of discipline- and workplace-specific transferable skills

Generic Skill	Real-World Professional Context	Real-World Use of Transferable Skills	Notes on Factors Impacting Skill Use	Source
Oral Communication	Health care with a focus on nursing in large hospitals (Houston, TX)	Nurses carefully listen, observe, document in writing, and translate info about patient status among members of care team to ensure patient safety and shared understanding, especially conveying key information during shift changes.	Patient care team typically comprised of parties from different disciplines, training, gender and socio-cultural identities (i.e., nurses, physicians, specialists); locations of communication events are bedside or nursing station which impact how info is recorded (e.g., digital, paper) and shared.	Hora, Smolarek, Martin & Scrivener, 2019
Critical Thinking	Photonics companies (NE - US) that design and make lenses, plastic optics, and parts used in lasers, projectors, etc.	Technicians use old designs or customer requests, along with calculations (e.g., lens curvature) from specialized or even custom-made software to inform decisions about design, production and quality control.	Tasks require good computational abilities and number sense, and willingness to learn industry-specific software; minoritized groups feel pressure to prove intelligence; documentation is key for problem-solving.	Leak, Santos, Reiter, Zwickl & Martin, 2018
Teamwork	Mechanical engineering, reporting on common skills and tasks in engineering firms.	Engineers regularly meet w/colleagues on teams to design and monitor construction projects for clients; requires ability to clearly speak and listen, negotiate, and collaborate w/both technical and non-technical audiences.	Engineering workplace is an oral, team-based culture w/many meetings and presentations to both technical and general audiences.	Darling & Dannells, 2003 *

* = This paper actually focuses on oral communication, but results highlight how teamwork and communication are inseparable in practice, highlighting the limitations of treating these particular skills separately.

Critiques and questions: Perhaps the biggest question facing the field of disciplinary skills research and pedagogy is the labor involved in properly teaching transferable skills using a situated, discipline-specific approach. In their excellent book, "Oral communication in the disciplines," Dannels et al. (2016) outline a series of steps for teaching discipline-specific communication competencies that require substantial faculty training and planning. Similarly, medical educators engaged in skills-focused teaching describe an approach to faculty PD that is more intensive than previous efforts that superficially addressed "soft skills" or that focused on

technical knowledge (e.g., Back et al., 2009). Further, while research in communication studies and in medical education are relatively robust, studies of other skills and in other occupational or disciplinary contexts are limited.

Research evidence: Studies of transferable skills within specific disciplines and/or cultural contexts can be found in educational anthropology and human development (e.g., Rogoff, 2014), communication studies (e.g., Darling & Dannels, 2003), higher education (e.g., Hora et al., 2019), K-12 education (e.g., Nasir et al., 2008), medical education (e.g., Back et al., 2009), and intercultural studies in business and management (e.g., Dunkel & Meierewert, 2004). With respect to transferable skills and faculty PD, however, the field of medical education is the most well developed, with curriculum on discipline-specific forms of skills evident in many training programs that represent a model for the rest of the postsecondary sector (e.g., Back et al., 2009; the ComSkil program at Memorial Sloan Kettering Cancer Center).

Increasing Career Services

Status: Career services (CS) offices have long been a feature of most college campuses that are either centralized, cross-campus units or are discipline-specific offices housed within individual colleges or departments. CS units typically offer advising appointments for students seeking help with career choices, hold workshops and materials for resume writing and job search strategies, host internship and career fairs, and offer online resources and personal portfolio tools. With respect to transferable skills development, most CS offices list the generic NACE competencies on their websites along with advice on how to develop them (e.g., internships), with some also offering workshops on skill development or online tools for documenting skills-related experiences (e.g., University of Minnesota). Recently, as attention to students' post-graduate success, the "skills gap," and the ROI narrative has grown, so too has attention to the role that CS offices play in the postsecondary sector, with more campuses investing in the size and scope of these units on campus (NACE, 2022; See also Rey, 2022 for a historical review of career services in higher education).

Critiques and questions: However, questions (and constraints) remain with CS office capacity and student utilization on many campuses, which underscores the importance of classroom-based skill development. A 2023 survey found that 31% of surveyed students had never visited their CS office, while 20% had gone just once (Flaherty, 2023). This survey also documented that 69% of the students had met one-on-one with faculty to discuss careers and skill development, highlighting the critical role that faculty play on these topics. Further, a 2022 study found a student-career advisor ratio of 1:2,263, indicating that CS units are woefully understaffed relative to the number of students (NACE, 2022). These studies also reveal that students primarily visit CS units for career exploration purposes (and not direct skill development), pointing to faculty classroom instruction and mentoring as one of the key "moments" where students can acquire key skills.

Research evidence: The empirical research on CS unit activities and impacts on students is relatively sparse and tends to be limited to essays in practitioner-oriented publications or large-

scale surveys[6] such as those reported in the media or by professional associations (e.g., Inside Higher Ed, NACE). Some lines of inquiry have explored the factors shaping students' use (or lack thereof) of CS services (e.g., Chin et al., 2019; Fouad et al., 2006). A much deeper literature exists on related topics such as career counseling, career exploration, and career-related learning, and future research hopefully will incorporate CS units into examinations of these topics.

Internships and Work-Based Learning (WBL)

Status: Internships and other types of work-based learning (WBL) are considered a "high-impact practice" (Kuh, 2008) that enhances students' time to graduation, completion rates, and post-graduate success (e.g., professional networks, job offers, etc.). Internships are also widely seen as one of the primary venues for college students to develop workplace-relevant transferable skills and competencies so that they can become employable or "career-ready" (e.g., NACE, 2023), with key skills acquired through on-the-job experience and mentoring from an employer. Consequently, internships have become a "hot topic" in higher education with many campuses increasing efforts to create, promote, and even require internships – with skills development as one of the central arguments driving this advocacy.

Critiques and questions: However, considerable questions exist regarding the quality, availability, and impact of internships on student outcomes such as transferable skill development. First, not all internships are high-quality learning experiences with sufficient mentorship, professional-level task assignments, and career relevancy, with some internships still involving low-quality menial labor (e.g., Frennete, 2013; O'Connor & Bodicoat, 2017). Second, the 2023 National Survey of College Internships in 2023 found that only 36% of students in 4-year institutions had taken an internship – meaning that the majority of students are not engaging in this experiential learning opportunity (Strada Education Network, 2024). Finally, equitable access to internships does not exist, as 63% of students who didn't take an internship had actually wanted to, but could not due to varied factors such as heavy courseloads, a lack of positions, or low (or no) pay (Song & Hora, 2024).

Research evidence: While the research on internships is international, interdisciplinary, and rapidly growing in scope and quality (see Hora et al. 2017 and Song & Hora, 2024 for reviews), little rigorous research exists on the impacts of internships on transferable skill development. Exceptions include a review of 31 studies on international internships where students self-reported positive inter-personal skill development but also where methodological problems plagued the reviewed studies (Di Pietro, 2022), a study of 154 business students in the UK found positive impacts of internships on "meta-competencies" such as self-regulation and self-awareness (Downs et al., 2024), and research finding that internships positively impact interpersonal (e.g., Divine et al., 2007) and critical thinking (e.g., Duncan et al., 2017) skills. However, the literature remains sparse on this crucial topic and is replete with the use of generic skills descriptors or vague measures of "soft skills," making claims that internships

[6] It should be noted that the methodologies used in some of these surveys are not published or transparent, making a scientific evaluation of their rigor impossible. Additionally, the sample populations for these surveys are either membership organizations or paid panels, and thus the survey samples are not representative of the broader population of both postsecondary institutions or college students in the U.S.

unambiguously increase students' disciplinary skills (e.g., problem-solving, communication) premature and unsubstantiated.

Advocacy for active learning in favor of didactic lecturing

Status: One of the most influential reform movements in higher education since the 1990s has been efforts to reduce didactic lecturing in favor of teaching methods that directly engage students in hands-on learning, most often called student-centered teaching or active learning. This shift was based on research in cognitive psychology (e.g., Chi & Wylie, 2014), discipline-based education research (e.g., physics education, Hake, 1998), and experiential learning in K-12 schools (e.g., Resnick, 1987) that showed how active instead of passive interactions with course content and classmates appeared to enhance student learning.

In higher education, the specific aim of many reform efforts was to eliminate the traditional 50-minute lecture or PowerPoint course, which some argued was the "pedagogical equivalent of blood-letting" (Weiman, 2014, p. 8320) in its outdatedness, lack of efficacy, and even potential harm caused to student learning. While much of this advocacy for active learning focused on content mastery (as measured by grades or exam performance) as opposed to transferable skill development per se, some have argued that active learning fosters "deeper learning" that combines both disciplinary knowledge and skills such as problem-solving or communication (e.g., National Research Council, 2012; Wiggins & McTighe, 2005). Specific techniques considered to be particularly robust in fostering such learning include problem-based learning, peer instruction, team-based learning, role-play simulations, and Socratic lecturing.

Critiques and questions: Critiques of active learning tend to focus on the conceptualization of the idea or category itself, and subsequent impacts on how particular teaching methods are operationalized in empirical research – both of which affect the quality of the evidence on their actual impacts on student learning and faculty PD. Some argue that the concept is an overly broad umbrella term that is less than useful for educational research (Lombardi et al., 2021), that the term inaccurately posits a binary of teaching behaviors (i.e., active vs. lecturing) without accounting for combinations or variations of the two (Hora & Ferrare, 2014), and that overly autonomous forms of student-centered learning are ineffective (Kirschner et al., 2006). Further, scholars contend that because experimental conditions in studies on active learning are too often poorly defined or controlled, claims of the superiority of these techniques over other teaching methods are over-stated and even untenable (Hora, 2014; Martella et al., 2023).

Research evidence: While the aforementioned critiques do raise questions regarding the quality of the empirical evidence in some studies, a considerable amount of research has documented the positive impacts of different active learning techniques on student learning. Some of these include research on methods that encourage groups of students' active construction of new ideas (e.g., Chi & Wylie, 2014), problem-based learning (Hmelo-Silver et al., 2007), and peer instruction (Henderson, 2019) to name but a few. Additionally, mounting evidence in the discipline-based education research (DBER) demonstrates the efficacy of active learning in fields such as

engineering (Prince, 2004) and biology (e.g., Knight & Brame, 2018). Finally, while some work exists on how active learning can support the development of disciplinary skills, particularly in in medical education (Back et al., 2009; Nikendei et al., 2007) and communication studies (Dannels, 2001), more research is needed in this area.

Careers Courses

Status: Another effort to address students' career readiness is to establish dedicated courses (both for- and non-credit) that focus on career development, job application strategies, and transferable skills development. These courses have a long history going back to the 1930s but have experienced a resurgence in recent years due partly to the under-utilization of career services offices, growing political and familial pressure to ensure post-graduate employment, and a perceived lack of career-related info across the traditional academic curriculum. An example of a course at UW-Madison is a 1-credit course whose stated goal is to, "Give you the tools you need to be able to seek out knowledge and skills as you make future career and life decisions," and that includes the creation of an "ePortfolio" that includes skills assessments, job application materials, and a personal tracking system for job seeking and career development. These courses are notable in that they reflect a desire to expand the reach of (poorly accessed) traditional career services offices by bringing career-related training into the classroom.

Critiques and questions: Some questions that the author has heard regarding these courses across multiple campuses pertain to the ultimate impact of these mostly elective courses, whether they complement or conflict with career services units, if they detract from core disciplinary courses in an already crowded academic calendar, and whether they reflect a "vocationalization" of higher education. But overall, these courses are too new for substantive, established, and documented critiques and questions to have surfaced.

Research evidence: Folsom & Reardon (2003) found in a literature review that career courses had positive impacts on vocational identity and career decision-making, with more recent work (Hansen et al., 2017) finding positive impacts of the courses on the total number of credits students graduated with and their cumulative GPAs. But little recent empirical research exists on the topic (for exceptions see Julien et al., 2023; Prescod et al., 2019), with more studies focused on generalized non-academic student support programs, suggesting the need for additional research on the prevalence and impact of career-focused courses.

Faculty professional development initiatives

Status: Professional development programs aimed at improving faculty teaching (i.e., faculty development) have long been a part of the postsecondary landscape, due in part to the fact that most faculty are never formally taught how to teach (Beach et al., 2016). Current PD programs vary considerably in duration, intensity, and topic, and cover issues ranging from the use of AI to

effective classroom management.[7] In recent years many faculty PD efforts have focused on introducing "active learning" or student-centered teaching techniques, which is a challenging proposition given the tendency for many faculty to teach using the didactic lecturing methods that they experienced throughout their own education. Transferable skills-related PD is especially active in fields such as medical education (Back et al., 2009) and is increasingly a part of broader career readiness efforts where faculty are trained to focus on workplace-related skills in their courses (Gray, 2023).

For the purposes of this guide, three modalities and venues for skills-related faculty PD are highlighted. While other types of faculty PD do exist, these are some of the most common and capture distinct vehicles (and respective pros and cons) for training faculty that should be considered as you design your own initiative.

Table 4. Three types of faculty professional development

	Description	Pros	Cons
Faculty self-study	Faculty within a department are given materials and guidance for revising their own courses and/or lessons on their own time.	High degree of faculty autonomy (and respect), low use of resources ($$, time), changes likely to fit unique course situations.	Unpredictable fidelity to guiding principles, potential for limited improvement, dependent on faculty motivation.
Facilitated workshop	Faculty from different departments or institutions attend short or multi-day workshops at a conference or on single campus.	Potentially large impact (i.e., scale), foster cross-unit collaboration and idea-sharing, ensure fidelity to guiding principles.	Requires skilled facilitators, may not be applicable to local contexts, potential high use of resources, if brief can be of limited value.
Consultant-led intervention	A consultant (either external or internal to unit) leads intervention to help faculty revise course curricula.	High potential for change, can coordinate program- or department-wide reforms, ensure fidelity to guiding principles.	Can alienate or offend faculty, requires skilled facilitator, high use of resources.

Critiques and questions: Professional development (PD) programs in education have long been critiqued for a variety of reasons that are important to address prior to creating a new skills-focused training program. These critiques include the focus on generic teaching methods without embedding the PD in disciplinary content, a focus on teaching technique without attending to course/lesson structure, ignoring contextual forces (e.g., student background, institutional constraints) that shape local teaching decisions, targeting individual instructors instead of cultivating communities of practice, overlooking the key role of feedback and critical reflection, and the lack of careful planning for PD programs that also engage faculty as collaborators instead of the targets of a top-down reform.

Research evidence: Extensive research now exists on what constitutes effective PD across multiple sectors and disciplines, with an especially robust literature on PD for medical students

[7] See the Professional and Organizational Development Network in Higher Education (POD Network) for examples of current programs and topical foci, as well as opportunities for networking, research on faculty PD, and upcoming conferences or trainings (https://podnetwork.org/).

and professionals (e.g., Steinert et al., 2016). Some of the key findings in the literature provided the foundation for the six C's of planning effective PD:

- **Content-focused:** Instead of training faculty in generic teaching techniques or ideas that are divorced from their disciplinary content areas, the PD should be grounded in specific content areas to enhance motivation, relevance, and coherence with real-world teaching situations (Darling Hammond et al., 2017; Grossman et al., 2009);

- **Curriculum design:** Too often PD focuses on new teaching techniques without addressing the underlying foundation of how the curriculum (i.e., course syllabi, lesson plans) itself is structured. Effective PD will focus on principles of instructional design (e.g., curricular alignment) and how new teaching techniques fit within the overall logic of a course's structure (Freeman et al., 2011; Wiggins & McTighe, 2005);

- **Contextualized learning:** Effective PD also situates the instruction of new techniques or approaches in the actual contexts of participants' own colleges, students, and classrooms, which avoids the not uncommon prospect that new methods are simply untenable in particular situations and contexts (Borko et al., 2010; O'Sullivan et al., 2011);

- **Community-based:** Research is increasingly showing that faculty learning is enhanced when PD uses a cohort-based model instead of focusing on individual instructors. By working with groups of faculty (who ideally share similar institutional or disciplinary contexts), PD can cultivate new colleagues, enhance peer instruction, and improve the adoption of new instructional approaches (Kezar et al., 2017; Steinert et al., 2016);

- **Critical reflection:** Effective PD also embeds opportunities for critical self-reflection as faculty learn new methods, which can be sparked by feedback from peers or PD facilitators. This phase can be challenging in short, one-off workshops which is one reason why longer duration PD programs tend to be more effective (Darling Hammond et al., 2017; Ebert-May et al., 2015); and,

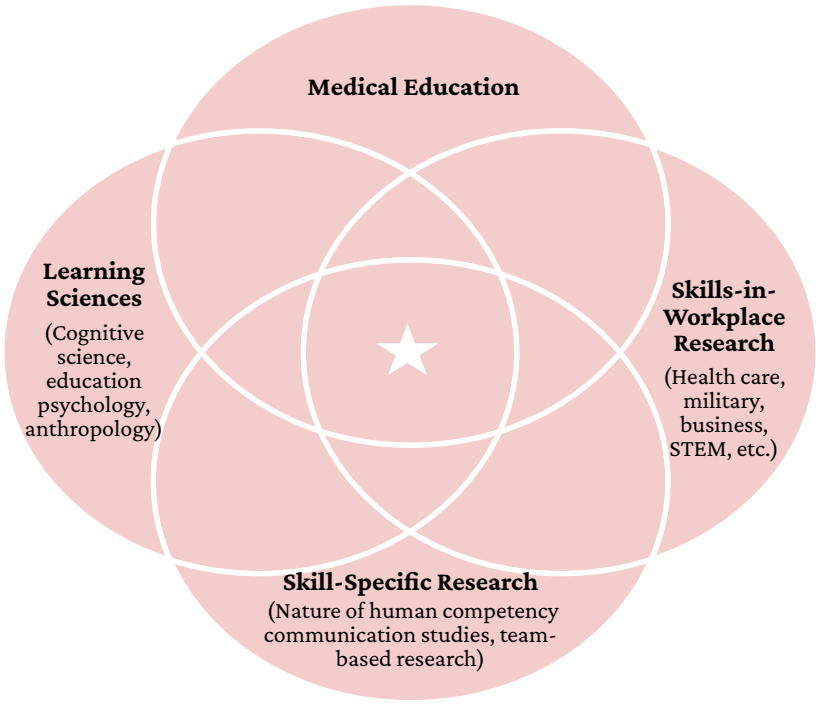
- **Collaborative planning:** Finally, research shows that engaging faculty as collaborative partners in teaching-related reforms is more effective than top-down mandates for change (Kezar & Eckel, 2002). This can be achieved through working with "grassroots" instructors from the beginning to co-design a change initiative or at the very least to include them in planning discussions to ensure the work is feasible and relevant. This stage of planning also requires preparatory meetings among key stakeholders to clarify goals, specific tasks or activities, timelines, and desired outcomes – a step in higher education change efforts that is too often overlooked (Hora & Millar, 2010).

These research findings are incorporated into various elements of this guide, and for an example of a PD approach designed specifically to help faculty better incorporate transferable skills into their courses (see Hora, Benbow and Lee, 2021).

6 KEY PRINCIPLES UNDERLYING A SOCIOCULTURAL APPROACH TO TEACHING TRANSFERABLE SKILLS

The sociocultural approach to teaching transferable skills outlined in this guide come from several disciplinary traditions and bodies of research literature. From these lines of inquiry six key principles have shaped my own research program and approach to faculty PD, as well as instructional reform efforts in medical education, communication studies, and other fields that have embraced a sociocultural approach. These principles are partly sequential in that the first represents the most foundational ideas that are built upon with each successive idea, but each element is equally important and informs the entire guide and recommended steps for instructors, departments, and institutions as they strive to improve how students are taught (and learn) transferable skills within their disciplines.

Figure 1. Different disciplinary literatures informing this teaching guide.



1. Reject the generic skills approach and instead articulate content-, context-, and culture-specific versions of key transferable skills

The first principle underlying this approach is the most important – to reject the use of generic, static lists of skills or competencies as the basis for teaching, advising, assessment, and strategic planning. While generic, vague and de-contextualized skills can be useful to spark conversations or get faculty thinking about the broader issue of skill and competency, they should be avoided at all costs when seriously engaging in instructional reform.

As previously noted, the reasons for this are plentiful but centers on the perpetuation of a fundamental misunderstanding of the nature of human skill itself as being inextricably linked to disciplinary knowledge, context-specific tasks, and cultural environments. Further, by completely ignoring the possibility that a person's conception of "good" skills can in fact reflect biased norms for appropriate behavior, the generic approach risks perpetuating racist, classist, sexist, ableist and other discriminatory views. Finally, an abstracted generic approach to skills instruction is simply contrary to the science on learning, which highlights the importance of providing students with contextualized content, problems, and applications.

So, what is better a course? For instructors to identify transferable skills within their own disciplines and/or professions in terms that specify content knowledge, contexts of real-world use, and cultural issues or variability associated with these competencies. Again, this view is grounded in the interdisciplinary research on the nature of transferable skills – as embedded in specific disciplinary or "technical" knowledge (e.g., NRC, 2012), as shaped by specific situations and environments (e.g., Dannels, 2001; Lave & Wenger, 1981), and as routinized cognitive scripts (e.g., Abelson, 1981) unique to specific situations and cultural settings (e.g., Rogoff, 2014). For examples of this alternative approach to conceptualizing and teaching transferable skills and their origins in actual field research, see Table 5 below.

But since articulating skills with such specificity may not come naturally to some faculty, along with the fact that most are untrained in backwards or skills-focused instructional design, there should be a structured approach (i.e., faculty PD) to help guide instructors to use this new approach. Thus, while some contend that faculty should just take generic skills lists and adapt them to their own disciplines, this suggestion obscures the complexity inherent in articulating skills and using them as the foundation for revising a classroom activity or course element. Simply put, the generic conception is both incorrect and worse, represents insufficient grounds for robust course planning and instructional design – instructors need transferable skills that are far more detailed and authentic for sufficient course planning, and most likely, to better support effective student learning of these critical transferable skills.[8]

[8] Note how research that compares a generic vs sociocultural approach does not exist. While literature exists on discipline-specific, authentic approaches in medical education, communication, they are not comparative or experimental in nature. Could be a future dissertation, research program, or sub-field of inquiry.

Table 5. Examples of transferable skills attentive to content, context, and culture

Old Generic Skill	New Version of Skill		Source
NACE Competency	**Content and Details of Task Performance**	**Context & Culture**	
Oral communication: Clearly and effectively exchange information, ideas, facts, and perspectives with persons inside and outside of an organization.	Nurses carefully listen, observe, document in writing, and translate info about patient status among members of care team to ensure patient safety and shared understanding, especially conveying key information during shift changes.	Patient care team typically comprised of parties from different disciplines, training, gender and socio-cultural identities (i.e., nurses, physicians, specialists); locations of communication events are bedside or nursing station which impact how info is recorded (e.g., digital, paper) and shared.	Hora, Smolarek, Martin & Scrivener, 2019
Critical thinking: Identify and respond to needs based upon an understanding of situational context and logical analysis of relevant information.	Technicians use old designs or customer requests, along with calculations (e.g., lens curvature) from specialized or even custom-made software to inform decisions about design, production and quality control.	Tasks require good computational abilities and number sense, and willingness to learn industry-specific software; minoritized groups feel pressure to prove intelligence; documentation is key for problem-solving	Leak, Santos, Reiter, Zwickl & Martin, 2018
Teamwork: Build and maintain collaborative relationships to work effectively toward common goals, while appreciating diverse viewpoints and shared responsibilities.	Engineers regularly meet w/ colleagues on teams to design and monitor construction projects for clients; requires ability to clearly speak and listen, negotiate, and collaborate w/both technical and non-technical audiences.	Engineering workplace is an oral, team-based culture w/ many meetings and presentations to both technical and general audiences.	Darling & Dannells, 2003 *

2. Use discipline- and task-specific transferable skills as the foundation for revising individual assignments, lesson plans, and/or classroom activities (i.e., backwards design)

The next principle is that creating a well-designed learning experience for students that highlights transferable skills is rather difficult and requires the close alignment among learning goals (i.e., skills) and how assessments, assignments, and classroom teaching activities are designed. Unfortunately, the skills discourse tends to overlook these issues, with some PD focusing on teaching methods alone (e.g., role play simulations or active learning) as if these techniques magically confer transferable skills upon students. Instead, what is required is to teach faculty the basics of how to put together a syllabus and lesson plan – basics of pedagogy that are routinely taught to future K-12 teachers but unfortunately are rarely covered in graduate school.

This issue of instructional design is doubly important for transferable skills, because traditionally the default learning goal in many higher education courses is content "coverage" or the memorization and mastery of the information contained in texts and evaluated through exam performance. In these cases, the design of a course (i.e., how lectures, assignments, and assessments are designed and integrated with one another) tends to follow a certain recipe – select a text or content area (e.g., causes of cardiovascular disease), pick an assessment method (often an exam or term paper), and in class meetings lecture about these topics (i.e., "forwards" design; Wiggins & McTighe, 2005). And such an approach makes sense if your primary goal is student mastery of the content, and while variations on this approach exist in higher education, this core model of teaching and learning persists on many of our campuses.

Besides the lack of attention to alternative modes of teaching, however, the traditional approach is severely limited in two ways: (1) it overlooks transferable skills as a learning goal in favor of content mastery alone, and (2) it fails to problematize which teaching and assessment methods are actually best suited for the learning of different topics and skills.

The first problem is relatively straightforward – if transferable skills are not articulated as a learning goal of a course, student acquisition of these skills highly unlikely. Thus, faculty should identify and specify them as a goal of the course! But doing so is not enough, nor is simply tacking a focus on skills or "career readiness" on as a post-hoc afterthought once the course has already been designed.

Second, the newly articulated skill learning goals should – along with its associated disciplinary content – drive the selection of appropriate assignments, evaluations, and teaching methods. This is the essence of the "backwards design" approach, which emphasizes the linear planning of a course from learning goal onwards while also highlighting the importance of "deep learning" or transferable skills development. Thus, a goal such as "effectively translate information on cardiovascular disease to patient care team" may lead to lectures on basic principles of the disease,

live demonstrations of effective (and ineffective) communication, case study analysis assignments, and a final evaluation of small group presentations in class. In this example, the transferable skill is clearly articulated and dictates how students should then be taught and assessed, instead of following the traditional content mastery and the lecture-exam recipe for college teaching.

This example from health care also highlights another key idea – that planning an actual lecture or assignment from generic "soft skills" is extremely difficult given the lack of details provided to the instructor. Planning a lesson, much like learning itself, is made considerably easier when dealing with concrete, relatable specifics instead of abstractions alone. Consider planning a lesson or assignment using the NACE definition of communication skills – "Clearly and effectively exchange information, ideas, facts, and perspectives with persons inside and outside of an organization." To do so would require translating this vague and abstract account to something far more specific to the instructor's discipline, course topic, and student background, which is a very difficult task that can lead to a wide range of outcomes varying in quality and efficacy. Instead, a sociocultural account of skills unique to the discipline and real-world tasks of a profession (e.g., nurses effectively translate information on cardiovascular disease to patient care team) provides faculty of all levels of training with a foothold for clear, specific, and detailed planning.

So, the principle here is simply this – design and select your classroom activities, assignments, or assessments based on whether they are clearly aligned with and will help your students achieve the discipline- and task-specific transferable skill that you've established as the goal for learning.

3. Teach skills using "lecture-modeling-practice-feedback" sequence appropriate for learning new professional norms, practices, and habits of mind as sociocultural behaviors

But even with the most detailed definition of a disciplinary transferable skill and the best designed active learning lesson, if an activity or assignment fails to treat the skill as the complex sociocultural behavior that it is, then the lesson will not achieve its full potential. Instead, as instructors we must explain and justify the skill and its learning via an introductory lecture, demonstrate or model the skill in action, provide hands-on opportunities for students to practice the skill, and then provide critical feedback on their performance to spur future learning.

This may seem like a lot of work for something as simple as "communication" or "teamwork," but consider the following scenarios, and the difficulties inherent in learning new cultural practices that are unknown or foreign to a student:

- A college graduate of non-Asian heritage from the Midwestern US gets a job in a Japanese bank in Osaka, and must learn professional business norms within a new culture and occupation in a foreign country;

- An adult making a career change who was raised in an upper-middle class family of white-collar professionals in Los Angeles is seeking employment in a small family-owned manufacturing firm in rural Wisconsin as a welder; and,

- A Latina student raised in El Paso, TX in a working-class family who has never left Texas is seeking an internship in the male-dominated IT sector with a firm in Seattle.

In each of these cases, you have someone striving to enter a new workplace and profession from a background that is not perfectly aligned with the "culture" of these new jobs or geographies. Now these examples aren't hypotheticals but are based on my own field research, which highlighted the importance of "culture" when we talk about skills, jobs, and career readiness. And a critical idea here is that culture– as the conglomeration of shared (and often tacit) norms, practices, beliefs, and rituals within a group – applies to organizations as much as it does ethnic groups or national populations.

That organizations like colleges or businesses had a "culture" was a revolutionary idea in the 1970s, when business and management scholars applied culture theory from anthropology to explain the success of the Japanese manufacturing industry, why some organizations fail (or not), and how to improve leadership, worker efficiency, and morale (e.g., Van Maanen & Schein, 1979). A key idea motivating these studies was that just as Mexico as a nation or Japanese-Americans in Los Angeles, CA have distinct "cultures," so too does a local engineering firm, a department in a university, or even a multi-national corporation. In each of these cases, there are norms and expectations for how to dress, problem-solve, communicate, work in teams, and so on.

Yet the generic skills and career readiness discourse completely ignores the cultural nature of skills and its implications for trying to enter a new workplace or occupation. This is highly problematic because it obscures the difficulties in teaching and learning these complex, discipline- and culture-specific competencies, and the prospects that an instructor may (un)intentionally convey biased or even discriminatory normative views of what constitutes "good" skill performance. For this latter problem of biased notions of skills, the key is for all instructors to self-reflect on their own views of appropriate skills as they teach their students, while the former issue of teaching and learning is best addressed by looking at the problem of learning in cultural terms as we do throughout this guide.

To effectively teach skills in such sociocultural terms, I draw upon interdisciplinary research on sociocultural learning and skills-related teaching to derive four key elements in teaching a novice or cultural newcomer a new behavior, habit of mind, or practice. A key idea underlying this approach is that cultural novices need a "scaffolded" entry into the new culture, much like Vygostky's famous zone of proximal development, which posits that learners initially need guidance to practice a new skill before entering a zone of independence and mastery (see Wass et al., 2011 for an example). Our job as teachers of transferable skills is to help guide our students to the zone where they are pushed beyond their current comfort level and proficiency but can accomplish more challenging tasks well with increasing difficulty and decreasing guidance. This is not easy, but here are four key steps that can facilitate this type of learning and mastery of transferable skills.

A. Lecture: The first step is deceptively simple but too often overlooked - tell the students via a short lecture about the transferable skill that they'll be learning. Explain to them what the skill is, how it's used in your discipline and a typical workplace, why it's important, and so on. Understand that many of your students won't have ever seen or heard of this transferable skill before, and you need to set the stage for them to appreciate its key elements and its importance to your profession. Besides explaining and motivating learning, this lecture component is also an opportunity to introduce, discuss, or contextualize the content that it is related to.

Now it doesn't necessarily have to be you that does this initial lecturing phase. You could bring in guest speakers or use video of other experts to explain the nature, value, and enactment of the skill. The key is that students need to know what a skill like breaking bad news to patients in a health care setting looks like, why it's critical for medical professionals to master, and specific instances where it likely occurs in the profession. In the not unlikely event that you or other faculty do not have concrete examples at hand for how the skill is used in various workplaces, speak to other colleagues, career services staff, or alumni for such details.

While this step of lecturing about transferable skills may seem like common sense, in our current era of active learning advocacy where some contend that lecturing is an ineffective or even harmful pedagogical approach (e.g., Wieman, 2014), it is necessary to highlight its value and argue for its inclusion in any new instructional approaches. The research is clear on the value – if not the need for – some element of lecturing in any lesson, with the key being that it is a method that just should not exclusively comprise an entire 50-minute lesson! But as the cognitive psychologists Schwartz and Bransford (1998) say, there is "a time for telling" in any teaching event, and scholars have long argued that even active learning methodologies like PBL require some verbal explanations and scene-setting for students (e.g., Hmelo-Silver, 2004; Kirshner et al., 2006). The same goes for transferable skills instruction, where the lecturing phase is crucial as students are often being introduced to new ways of thinking and acting for the first time.

B. Demonstration and modeling: Next, learners of any new skill – particularly ones that involves subtle behavioral components like most transferable skills – greatly benefit from watching an expert demonstrate or model the skill. Known in learning theory as "vicarious learning," or learning through observation and reflection on another person's actions, the act of observing another person demonstrating a particular skill or behavior provides learners with exemplars for how experts actually think, act, and behave in an optimal manner. Think of a golf instructor demonstrating how to swing a club, an expert woodworker demonstrating how to make a cut, or an experienced nurse showing students how to communicate chart notes during shift handoff. Demonstrating your own discipline- and task-specific transferable skill for students is equally important, and along with a mini-lecture to introduce the skill, sets the stage perfectly for the practice phase.

> *"Vicarious learning is learning through observation and reflection on another person's actions*

The strength and efficacy of vicarious learning has long been demonstrated in psychology, human development, and educational research (e.g., Bandura, 1965; Hermann et al., 2013; Nestel & Tierney, 2007), but unfortunately the basic act of modeling transferable skills remains uncommon in postsecondary teaching. Of course, some disciplines and courses have a long tradition of modeling key skills – think of a chemistry or mathematics class where instructors work out problems on a blackboard in front of the class – where an expert's way of thinking and reasoning is essentially made visible for novice learners. In medical education, educators have used modeling via role-play simulations to demonstrate behaviors like breaking bad news to patients, which is near impossible to learn if the concept remains abstract and unperformed.

So, after lecturing about the skill – demonstrate it! The demonstration can be from you, a colleague, alumni, or a visiting employer, and also consider modeling different forms (e.g., good and bad) or variations (e.g., different situations or contexts) of the skill so that students can see how the skill-in-action varies in the real-world of social action. But this is such a critical step that you should spend ample time preparing a demonstration and thinking through its possible variations, before turning to the next phase of active learning.

C. Practice: Next, after learning about the skill and its importance via lecture, and seeing it demonstrated in real-time, it's time for the students to actively engage in practicing the skill(s) on their own. This is where active and not passive learning comes into play, as listening to a 50-minute lecture or PowerPoint about teamwork in engineering or communication in health care is clearly not sufficient – now, as with any new cultural practice, novices must get some hands-on experience with the new behavior or habit of mind.

This contention is grounded in research on experiential and active learning, which has found that learners' active engagement with the material – particularly when they collaborate to actively apply their new knowledge to authentic problems - is generally more effective than an exclusive reliance on passive listening (Chi & Wylie, 2014). While this does not mean that lecturing is completely ineffective as a teaching tool, it does suggest that an exclusive reliance on lecture is inconsistent with the research. This is especially true for transferable skills, as competencies like critical thinking or problem-solving cannot be learnt simply by listening to a lecture – something that math and chemistry instructors have long known in their assigning problem sets as homework, where hands-on, active engagement with the material is a crucial step in learning. Thus, it is critical that you identify some way for your students to engage in hands-on activities where they can practice using the new content knowledge while also practicing the skill you've defined and demonstrated.

There are many, many different active learning methods and approaches, and there is no one-size-fits all or "magic bullet" technique that can be used in all situations. Instead, you'll have to select an approach that best fits the material being taught that day, the flexibilities in your curriculum, and other situational constraints. Also consider consulting with colleagues or your campus Center for Teaching and Learning (CTL) for ideas. Here are a few approaches, however, that the literature has shown are particularly well-suited for teaching transferable skills:

- **Role-play and Simulation:** This approach is especially popular in health care, where students first observe a role play about particular behaviors like breaking bad news or trouble-

shooting a patient issue in the ER. This role play may involve the use of scripted language, different versions of the same situation, and with other students or guests enacting roles (e.g., a patient) for student practice. Students then practice these simulated events on their own or with classmates, followed by a performance for the instructor which can be critiqued and graded (e.g., Comer, 2005).

- **Problem-Based Learning (PBL):** PBL is an approach that typically spans multiple class meetings where small groups or pairs of students work on an open-ended problem or prompt that requires considerable investigation, collaboration, and problem-solving of a real-world issue (Hmelo-Silver, 2004). Sometimes educators collaborate with local community members such as employers or non-profit leaders to identify locally relevant problems (e.g., reducing nitrogen run-off from suburban lawns into lakes). Students then work on the problem in groups, conduct background research via primary or secondary data sources, critically evaluate the data, and then present their findings to the class.

- **Small Group Discussions:** While most instructors are familiar with some form of classroom discussion, the number of distinct techniques for designing and facilitating discussions can be surprising. Approaches vary considerably in their complexity, duration, and suitability for different media or course purposes, from quick "think-pair-shares" that can be used in most any lecture setting, to the more complex "jigsaw" technique that involves group text analysis. Regardless of approach, small group discussions are excellent vehicles for deepening students' understanding of the material while also practicing key skills such as disciplinary forms of communication, reasoning, and collaboration.

- **Student Presentations:** Presentations are a well-known learning activity and can take many forms, most commonly as a summative oral presentation where students discuss the results of a research project or paper. But often the presentation assignment is given without explicit guidance on key transferable skills required to prepare a successful presentation such as different types of oral, visual, and non-verbal communication, logic and reasoning, and teamwork if done in a group setting. Variations that are also useful in providing practice with transferable skills include poster presentations that mimic a research conference, a "pitch" to a group of faux investors, and other scenarios where students must convey or sell an idea to an audience in a real-world setting unique to your discipline.

- **Argument Mapping and Think-Aloud Problem-Solving:** One of the most effective ways to teach students forms of thinking, reasoning, or problem-solving that are valued in your discipline is to walk them slowly through an example of such thinking in your field. This could be done in a variety of ways, such as diagramming text and mapping out the logical steps in an argument (i.e., argument mapping in philosophy), marking up a research paper or piece of writing and discussing the author's logic (or lack thereof), or verbally "thinking aloud" while you as the instructor work through a problem set or situation. The key here is to slow down the experts' form of thinking so that a novice can see each step of the process, while also articulating or identifying each of these steps so students can begin to see how professionals think, reason, or trouble-shoot in your discipline.

When selecting these or other active learning techniques, it is crucial to remember the old adage that no one size fits all, but instead carefully select a teaching approach or activity that fits your students, your course, and the day's lesson or topic. In other words, don't shoehorn a method like role play or PBL into a lecture where it makes no sense, just because it's a high impact practice or research-based method!

Also, since many students won't be familiar with these activities, make sure to introduce the technique and describe the nature and depth of their involvement that will be expected. For instance, when introducing the think-pair-share method, first explain the activity and then give them an easy prompt to practice – then debrief to see how things went. After students understand the activity, slowly add harder questions or prompts, so that after 3-4 times the method will become normalized in your classroom. This is an example of scaffolding – where instructors scaffold or build the learning progressively from easier to harder, less independent to more independent, but with ample explanations during the early stages of learning.

D. Feedback: The final step is deceptively simple – to provide honest, detailed, and critical feedback to students on their performance of the targeted transferable skill. This step is based on insights from experiential learning (e.g., apprenticeships) and assessment in higher education, both of which highlight the value of providing learners with immediate feedback. While formative (i.e., quick, low-stakes feedback) is particularly valuable and applicable for transferable skills, as students benefit from early critiques on their practicing of new behaviors, summative forms of assessment can also be used such as final presentations or exams. In both cases, however, the best feedback should not be vague or generic – it must be clear, detailed, and specific (Nicol & Macfarlane-Dick, 2006). With feedback to correct errors and/or reinforce successful student performance, as an educator you close the loop on learning transferable skills as a sociocultural act.

4. Start small! Aim to revise or create individual lessons and/or assignments instead of trying to overhaul an entire syllabus or create national skills benchmarking systems

One of the pitfalls of educational reform is the tendency to move too fast, too big, and with too little attention to the real needs and constraints of the front-line educators (and students) who are most implicated in the actual work of reform. A considerable literature exists on the overreach of educational reform efforts in the K-12 world, particularly with respect to top-down policies such as the No Child Left Behind Act of 2001 (e.g., Cochran-Smith & Lytle, 2006), and on why faculty consistently appear to reject active learning initiatives (e.g., Henderson et al., 2011).

While some of these studies certainly reveal some irrational recalcitrance or outright stubbornness on the part of classroom educators, the literature consistently highlights the tendency of reformers to ignore the lived realities of faculty in their day-to-day work, disrespect their expertise as

professional educators, and especially to overlook the constraints of the modern college or university that tends to underfund and overwork its staff. This is why scholars of both K-12 and postsecondary faculty PD argue that the best way to affect changes in teaching (and thus student learning) is to acknowledge educator expertise, start small, and to situate any potential changes in disciplinary content and especially the real-world constraints of everyday classrooms (e.g., Darling Hammond et al., 2017; Grossman et al., 2009; Kezar et al. 2017).

In the case of efforts to reform how transferable skills are taught in higher education, however, the tendency is to not build on these research findings on past instructional reforms, but to go big and with little attention to the actual tools, training, and classroom constraints of faculty. In my own research on how faculty approach transferable skill instruction in their classrooms, I have come across the following scenarios:

- The entire faculty of a community college given lists of NACE competencies and told that they would be evaluated on how well they taught them – but with no guidance about how to teach transferable skills, or what the evaluation system would look like;

- An academic department articulated program-wide learning outcomes based on generic skills, but did not define these skills in detail or inform faculty that they were to be embedded into the design of their courses, frustrating faculty about the ambiguity of the skills and the un-articulated expectation that they would highlight them in their teaching;

- Faculty and assessment professionals in multiple conference sessions on assessment rubrics focused on generic skills (i.e., AAC&U Value Rubrics) expressing strong frustration with the tools not being discipline- or assignment-specific; and,

- Faculty being told by administrators to overhaul their entire courses (i.e., the syllabus) to feature "soft skills" or "NACE competencies" but with no guidance on how to do so, resulting in superficial changes in the syllabus with little impact on actual lessons or assignments.

Of course, there are cases where ambitious, large-scale instructional reforms work. Consider the Writing Across the Curriculum (WAC) movement that led many campuses to prioritize and embed writing instruction across departments, or the active learning movement which has led to cross-campus recognition of the value of hands-on, engaged teaching. So, scaled-up change clearly can happen in how faculty design and teach their courses.

But the key is to start small, and in the case of transferable skills refers not only to the scope and ambition of an initiative, but to the unit of analysis within a course that is the object of change efforts. As noted in Principle #2 above (Use detailed transferable skills as the foundation for revising individual assignments, lesson plans, and/or classroom activities (i.e., backwards design), to properly design a robust learning opportunity featuring transferable skills you must start with actual lessons, classroom activities, or assignments, and not an entire syllabus! The unit of analysis for change in that case is simply wrong and too large. Instead, appropriate building block for change to embed transferable skills into a course is the smallest unit possible for a teacher – the individual assignment, lesson plan, or activity. So start small!

Finally, a note on assessment and goals to build a national benchmarking system (and database) of students' generic skills (NACE, 2024). In my view such a goal is both methodologically premature but also potentially dangerous with respect to stereotyping students based on race, gender, class, and other identities, which can reify existing discriminatory views. Assessing transferable skills is notoriously challenging, as is evidenced by decades of efforts to establish a reliable and valid test for critical thinking (e.g., Liu et al., 2014), and current rubrics for evaluating generic skills lack transparency regarding their methodological history, peer-review in objective publication outlets, and validated procedures for objectively assessing task performance. This latter point hits close to him as I spent decades developing a classroom observation instrument for faculty teaching – an endeavor I ultimately left behind due to the impossibility of capturing important elements of instruction with precision, reliability, and validity (e.g., Hora, 2015). But setting aside for a moment the significant methodological questions facing generic skill assessment systems, the prospect of disaggregating such data by race, gender, and other identities is a recipe for reifying discriminatory stereotypes about how certain groups think, communicate, work in teams, and so on. The dangers of such thinking have long been documented (e.g., Moss & Tilly, 1996) and should not even be seriously considered, much less enacted on a national level.[9]

5. Carefully design faculty development programs using research-based principles (i.e., content-focused, curriculum re-design, contextualized, community, critical reflection, and collaboration) while prioritizing faculty autonomy

Regardless of the type of faculty PD program you are considering - faculty self-study, facilitated workshops (i.e., at conferences or at a single campus), or consultant-led interventions – it is crucial to engage in a careful, deliberate, and evidence-based design process. Avoid the tendency in higher education to take a top-down approach where instructors are told – with little buy-in or authentic engagement – to adopt new curricula, teaching methods, or policies. Also do not overlook the six key ideas outlined in the previous section (pp. 18-20) from empirical studies on educational reform, which highlight the importance of PD that is content-focused, involves curricular re-design, employs contextualized learning, builds community, fosters critical reflection, and engages faculty in collaborative planning. All of this means that a good and effective faculty development program cannot be a quick fix, but will take time, expertise to design and facilitate the process, and commitment from multiple parties.

Fortunately, there are examples of faculty PD focused on transferable skills development that follow these principles such as programs at the City University of New York (Wilks & Ziehmke, 2023), Purdue and the University of Minnesota (Smydra, 2020), and my own 7-week online course

[9] Instead, I urge continued attention to the development and rigorous testing of skill-specific assessments that take into account the issues outlined in this guide (e.g., disciplinary content, task situation, culture – see Dannells et al., 2017), and also efforts (e.g., Fischer et al., 2022) to analyze course syllabi and other instructional artifacts for the presence of a focus on transferable skills.

for faculty at the University of Wisconsin-Madison. Each of these examples sidesteps the top-down approach while engaging faculty in updating their own courses with guided reflection and expert assistance. Approaching instructional change in this manner is critical, as it acknowledges the authority that faculty have in shaping their own classrooms, while also paying respect to a profession that has in recent years been attacked and disparaged.

6. Use a big-tent approach when describing skills-related teaching and learning to students and campus stakeholders – highlighting the value of transferable skills for civic engagement, intellectual growth, and career readiness

The final principle underlying this guide pertains to how we as postsecondary professionals frame and discuss the purpose of higher education to our students, the public, policymakers, and ourselves. Unfortunately, in recent years this purpose has come to be exclusively about a student's "return-on-investment" (ROI) or how to boost the economy and meet employers' needs – valuable and important goals to be sure, particularly in uncertain and unstable labor markets, but certainly not the only goal.

This argument also positions transferable skills primarily (if not solely) as commodities important for their value in the labor market, and not for other potential purposes or applications. As the anthropologist Bonnie Urciuoli (2008) argues, such a framing has led students to view key human aptitudes and features of civic life such as "teamwork" solely as marketable bits of themselves that employers "buy" when hiring new employees. This neoliberal view is part of a larger political and ideological exercise, and one that has arguably drowned out other purposes of higher education that have traditionally been championed by our sector – the growth of knowledge, preparing students for civic engagement, advancing and addressing community needs, and solving pressing problems (e.g., cancer, income inequality, climate emergency).

Yet the skills discourse, in framing transferable skills – which are so crucial for each of these non-economic purposes of higher education – reduces these core human competencies to mere entries on a Linked In profile or resume to sell in the marketplace. Thus, I argue that the field should adopt a more "big-tent" approach to discussing skills to students, faculty, and other stakeholders for two reasons: (1) the ROI framing of skills alienates large swaths of professional educators who are dedicated to the liberal arts tradition, knowledge production, or civic engagement – other traditional purposes of higher education, and (2) viewing skills solely in economic terms inaccurately and unnecessarily strips them of their cultural, professional, and human richness.

Instead, it is more inclusive, persuasive and accurate to discuss transferable skills – why they are important to learn and teach – in terms that encompass all of the traditional purposes of a college education. Career readiness is certainly one of these goals, but not the only one.

STEPS FOR USING THE DISCIPLINARY SKILLS APPROACH IN THE FIELD

In this section the specific steps used to implement the disciplinary skills approach in the field are described in detail, whether for faculty self-study, facilitated conference workshop, or consultant-led intervention applications. Regardless of the modality, however, it is important to note that this approach is not a rigid prescription or recipe for change that must be followed to the letter, but instead is a set of research-based guidelines to consider as you adapt these ideas to your own unique circumstances, students, and personnel.

That said, the principles of skills articulation (as opposed to the generic conception), a commitment to robust instructional design, and understanding the sociocultural teaching sequence should be at the heart of any effort using the approach outlined in this guide.

Table 6. Outline of key steps of the Disciplinary Skills approach

	Logistics & Preparatory Phase
Step 1: Convene key stakeholders & discuss guiding principles and logistics of the work.	Gather key stakeholders linked to the academic program being revised (especially faculty) to discuss goals, scope of work, specific tasks for role groups, decision-making power, situational constraints, resources, and timelines. This meeting is also an opportunity to reframe the group's understanding of skills, sociocultural learning, students' future pathways, and principles of effective PD.
	Faculty Reflection & Initial Revisions Phase
Step 2: Select course to focus on for all subsequent revisions.	Begin by selecting courses and related content areas to focus on for revision process – ideally select those with flexibilities in curriculum and that already highlight key skills.
Step 3: Identify desirable disciplinary skills relevant to course and articulate how skill is used on real-world in great detail.	With the target disciplinary content and overall course goals in mind, define in fine-grained detail the key disciplinary skills that will be emphasized. Go beyond generic descriptors to specify real-world enactment of the skill, detailed sequences of activity, physical location, and relevant role groups and professional or cultural norms. If necessary, consult with colleagues, alumni, employer relations, or career services staff for this information.
Step 4: Identify course component to revise based on: (a) situational constraints of instructor time and curricular flexibility, and (b) lesson or assignment most aligned with targeted disciplinary skills.	Selection of course component (e.g., assignment, classroom activity) to revise should be carefully considered. First, honestly evaluate instructor bandwidth available to engage in revising a course, then examine existing curricula to identify areas where changes are feasible and where no flexibility exists. With these constraints in mind, look for course component most aligned with disciplinary skills identified in Step 3. Start small with individual assignments/lessons instead of revising the entire syllabus!
Step 5: Use planning template to brainstorm new lesson structure, ensure alignment among course elements, and specify steps of sociocultural learning sequence.	Use the Disciplinary Skills planning template to ensure that new teaching methods, assignments, or activities are: (a) "backwards designed" to be aligned with skills-related learning goals and other course elements, (b) includes detailed plan for the specific phases of the sociocultural learning sequence for classroom activities (i.e., lecture, modeling, practice, feedback).
	Curricular Revision Phase
Step 6: Update course materials (e.g., syllabus, lesson plans, lecture slides) with new skills-focused changes.	Make permanent written changes to course syllabus (e.g., disciplinary skill learning goals, assignment and/or activity descriptions) and daily lesson materials (e.g., lecture slides, lesson plan notes) to clearly signal to all instructors and students the centrality of skills learning within the course.
Step 7: Re-convene key stakeholders to review progress and discuss next steps.	Re-convene stakeholder group to learn about the results of the course revision exercise, discuss pros/cons of process and situational constraints, consider next steps.

Logistics & Preparatory Phase

All too often educational reforms make two critical and interrelated errors that are common to many efforts aimed at changing organizational behavior and performance: (1) failing to adequately plan out the proposed work in a detailed manner, and (2) failing to engage the "grassroots" workers who will most be affected in this planning process. This is especially the case when external forces (e.g., grant deadlines set by funders, political pressure) push leadership to enact a change agenda immediately, but without adequate planning or preparation. At a time when the higher education workforce is stressed, overworked, and increasingly lacking job security, making hasty and ill-informed demands on how instructors design and teach their courses can backfire in a variety of ways.

So, to increase the prospects that your efforts at enhancing skills-focused teaching and learning at your institution will be a long-term success, follow this first step and take the time to convene key stakeholders to carefully and collaboratively specify the nature, scope, and timelines for the work.

Step 1: Convene key stakeholders & discuss guiding principles and logistics of the work

The first step of this preliminary planning and logistics phase is to determine who should be at the table as you discuss the work. The composition of this group will necessarily vary depending on which of the three modalities for faculty PD that you select (i.e., faculty self-study, facilitated PD workshop, consultant-led intervention), but regardless of the program type it is still important to think carefully about whose voices, interests, and experiences are included. The composition of this initial group will position certain resources and perspectives at the center of the work from the outset, which can minimize miscommunications or missed opportunities later, while also sending messages regarding who you consider essential (or not) to the work of teaching improvement for your campus or community.

Programs that are aimed at specific departments or academic programs – whether faculty self-study or consultant-led interventions - should focus on stakeholders conversant with relevant courses, programs, and students (e.g., department chair, curriculum committee members, teaching faculty, career services staff). In contrast, efforts such as facilitated PD workshops held at a disciplinary conference or a cross-campus event should include the facilitators and representatives from targeted institutions and disciplines (i.e., department administrators, faculty) who can ensure that the planned work is realistic and relevant. Ultimately, the research on collaborative or cross-organizational work is clear – you want representatives at the table to understand the nature of the tasks at hand, have a direct stake in the outcomes, and represent as many diverse perspectives as possible that are salient to the work itself.

Finally, consider convening a group that is as inclusive as possible and represents the different constituencies, identities, professional backgrounds, and personal experiences that are relevant to the academic program being considered for revision. This means possibly including a student, and ensuring that people are at the table who can advocate for instructional reforms that are feasible and appropriate for existing institutional constraints (e.g., classroom layout, teaching workload),

and for learners and instructors from diverse identities and experiences (e.g., disability status, racial/ethnic identity, etc.).

Now that you've developed an invite list for this meeting, what do you talk about? The agenda should include two key elements: (1) a preparatory discussion of the principles behind this approach to skills-focused instructional change, ideally led by a trained facilitator or a respected institutional or department member who is conversant with key principles in this guide (e.g., skills, sociocultural learning), and (2) a discussion of logistics and expectations behind the work.

Principles of the Disciplinary Skills approach to discuss

When engaging in work that can be interpreted and approached in a wide variety of ways, it is crucial for all participants to come to a common understanding of the governing principles or ideas behind the work itself. In the case of skills-focused teaching at the college or university level, there are many misunderstandings about the nature of human skill, how to design courses and lectures, how people learn, and the most effective ways to improve teaching practices. In fact, these topics are not only widely misunderstood but some are hotly contested and debated, making it essential that your stakeholders – if not coming to a consensus on these topics – at least understand the research evidence that informs the Disciplinary Skills approach.

At this early convening of your stakeholders, a facilitator should briefly review the following topics, with additional information, details, and references available from earlier sections of this guide:

- The need to reject the notion of "skills" in terms of generic competencies, such as those promulgated by NACE, AAC&U, and many other organizations. Instead, skills should be viewed as content- and task situation- specific competencies for task performance that need to be defined by disciplinary experts at the outset of work as the basis for all future changes to the curriculum and/or teaching approaches.

- That teaching a novice a new discipline-specific skill is a complex task like teaching someone how to act or think in a new culture, and that requires an explanation of the skill (i.e., lecture), a demonstration of the skill, practice with the skill, and then expert feedback on their performance. Thus, simply adopting new teaching methods (e.g., active learning) isn't sufficient, and lecturing does play an important role in this learning process.

- That teaching improvement requires careful attention to how specific learning goals (i.e., skills), classroom activities, and assignments or assessments are aligned, and then how this "through-line" is clearly communicated to students so that they understand that skills development is a primary focus of the course.

- The value (and need) to start with small changes to the curriculum and/or one's teaching, and not attempting to revamp an entire course but to start working with a single lecture or activity. Working at such a fine-grained level is in fact essential when working with this approach, as content- and task-specific skills must be coherently linked to activities and

assignments, which takes place not at the abstract or macro-level of a course syllabus but at the specific, micro-level of a specific lecture or assignment.

- That faculty and classroom instructors should maintain decision-making authority regarding changes to curriculum and instruction, as they are the disciplinary experts who best know the courses, the material, and the students.

- The value of framing the learning of "skills" not only in vocational terms but also as essential for scientific advancement and civic life, where abilities such as critical thinking and collaboration will have multiple benefits for students throughout their lives and careers. Framing skills solely in terms of careers – while important and likely to capture students' attention – unnecessarily delimits how important these skills are for other purposes of higher education.

Logistics of the work to discuss

While reviewing these key principles and ideas is critical, at this preliminary meeting it is arguably more important to discuss and agree upon details for how and when the work will be conducted. The following elements are based on research on effective collaborative and reform-oriented work in organizations (see Hora & Millar, 2010), and decades of personal experience participating in both effective and ineffective multi-party projects.

- Agree upon the scope of the work, especially which courses will be "targeted" or revised during the project. Keeping in mind that starting small and modest is ideal, try not to tackle an entire departments' curricula, but instead home in on courses whose faculty of record are willing to engage in revisions and that have some flexibilities (e.g., not core courses required by multiple majors).

- Determine who has ultimate decision-making power for changes to the course, and ideally give this authority to faculty and instructors teaching the course. For courses taught on a rotational basis, the group will need to determine whether the current instructor or the collective faculty have the final say in approving revisions. But it is essential to publicly clarify who has authority to avoid any disagreements or tension at a later date.

- Specify goals and objectives for the work, which include both over-arching aspirational statements about where the department or course(s) will be in the future (i.e., goals) and also more specific, quantifiable, and time-sensitive targets or deadlines for when the work will be completed (i.e., objectives). Ensure that all parties agree upon the terminology or jargon used when making these statements, as different disciplinary, professional, or cultural groups likely will interpret key terms such as "curriculum" differently. Ultimately, the group should determine what the final products of the change effort should look like (e.g., revised syllabi, lesson plans, or PowerPoint lecture slides).

- Identify campus resources available for instructors as they revise their lessons, such as tips on active learning from Centers for Teaching and Learning (CTL) staff or insights on employer skill needs from Career Services (CTL) units. Staff from these two units are particularly

important for the curricular changes outlined in this guide, as CTL will likely have a robust catalogue of active learning techniques that could be used in the practice phase of the sociocultural teaching sequence, while CS will have direct knowledge of and connections with employers and their up-to-date skill-related needs. Tap into these resources and build bridges across units that are too often uninvolved in curricular change.

Faculty Reflection & Initial Revision Phase

After your initial planning and logistics phase, it is time for instructors to select an assignment or lesson plan to revise with newly articulated skills learning goals and classroom activities. Before jumping to picking new teaching methods however, it is essential to carefully reflect upon the best activity to revise and the specific nature of the skills you want students to acquire. The next step is to then ensure that your skills-related learning goals, teaching methods, and assignments or assessments are clearly (and coherently) aligned, and that the classroom activity includes the sociocultural learning sequence (i.e., lecture, demonstration, practice, feedback). A planning template is included in this guide to help workshop facilitators and instructors with this process.

Step 2: Select course to focus on for all subsequent revisions

The first step in the revision process is to select a course – and its syllabus, daily lesson plans, assignments, and classroom activities – to update with a new emphasis on disciplinary skills. Ideally, faculty can select a course where they have the freedom and authority to make revisions, instead of a core course (e.g., English 101) that may have little room for change or that would require extensive meetings or external approval for any alterations to the existing curriculum. Another key consideration for selecting a course for skills-focused updates could be whether it has elements (e.g., an end-of-term student oral presentation) that already features one or more of the key skills that are being emphasized, as it is much easier to revise existing assignments or classroom activities instead of creating new ones from scratch.

Some criteria for selecting a course to revise:

- *a course with curricular flexibilities where updates can be made without extensive approvals.*
- *a course with existing assignments or activities that feature key skills.*
- *a course whose typical students have demonstrated a need for skill development*

Additional considerations for selecting a course include whether it is taught by a rotating cast of faculty instead of a single instructor of record (which makes adopting new approaches more difficult), if students who take the course are in particular need of key skills (e.g.,

perhaps first-year students reasoning skills are in need of improvement), and the experience level of the instructors who typically teach a given course.

After you have selected a course to focus on, it is critical to not immediately attempt an entire revamp or overhaul of the entire course – instead, there are two things to consider before jumping to that not uncommon stage of large-scale reform. The first is that before any revisions or updates can occur, it is essential to take a pause and think deeply about the disciplinary skills that will be emphasized, and then to define them in fine-grained detail (see Step 3 below). The second is that revising a course with the approach described in this guide – with attention to authentic and not generic skills, and to principles of effective instructional design – requires working at the micro-level of individual assignments or lesson plans and not at the macro-level of an entire syllabus (see Step 4 below).

So after selecting a course to work with, make sure to pause and carefully define your targeted skills and then select individual units or lessons to work with, instead of trying to immediately revamp an entire syllabus or group of courses.

Step 3: Identify desirable disciplinary skills relevant to course and articulate how skill is used in the real-world in great detail

The next step is perhaps the most important and serves as the foundation for all subsequent revisions to your course and subsequent student learning - to shift away from abstract and generic conceptions of skill to a more detailed, contextualized, and content-driven account of how people actually perform tasks in the real-world.

Whether faculty are working solo via a self-study, with a facilitator at a workshop, or with an external consultant as part of an institutional initiative, it is critical to guide faculty to start thinking of skills in these more fine-grained and authentic terms. While it may be useful to share the AAC&U or NACE lists of these generic skills as a conversation starter, these lists should be quickly set aside. Instead, instructors need to define "skills" learning goals for their courses in terms of how professionals in their field use their disciplinary knowledge to perform common tasks in the field. Otherwise, faculty risk boring their students with overly abstract (and academic) lessons about generic skills, reducing their learning of core disciplinary content and related skillsets, and potentially reifying their own normative (and potentially discriminatory) views of what constitutes "good" communication skills.

So once instructors or key stakeholders have selected a course to work with, the next step is to define the primary skills (and associated content) that are either current or desired learning goals for students. As a first step, it is useful to take stock of the current status of skills-related learning goals in the course, which can help to: (a) ensure that you are addressing any pre-existing and/or inflexible skills-related requirements (e.g., written communication in a writing course), (b) identifying implicit skills emphases that could be expanded and enhanced, or (c) identify gaps in the course where a new focus on skills could be introduced. Thus, take some time to review the course syllabus, lesson plans, or lecture notes/slides to identify explicit, implicit, or non-existent emphases on key skills, and use this information to settle on which skills to emphasize in subsequent course improvements.

Next, select 1-2 skills to focus on for the initial round of revisions, based on either the explicit or implicit emphasis on these skills in the current syllabus, or on your identification of a new skill to introduce or emphasize in the course. It is at this early stage where generic descriptors of skills (e.g., oral communication, critical thinking, teamwork) may be useful, as you and your colleagues make decisions at the preliminary and macro-level about which skill categories to highlight in the course. But this stage of relying on abstract skill descriptors must quickly shift into the next key step – defining the skill for your course in detailed, discipline- and action-specific terms.

As you define these skills in more fine-grained terms, think of how the competency is actually used in the professional workplace, and how the disciplinary content knowledge featured in the course is implicated in the use of skill to perform authentic tasks. Write down these more nuanced descriptions of skills in as much detail as you can manage. In cases where it is hard to define a skill in this way due to a lack of knowledge of how they are used in the modern workplace – an issue faced by some instructors who have spent their entire careers in academia - consult colleagues who have worked in industry, career services and employer relations staff, or alumni of your programs who are now in the workforce. It is important to not limit yourself to just industry or private sector workplaces when you identify key skills but consider any possible location where students in your course could use their knowledge to perform an important task (e.g., an academic research group, a government agencies, or a non-profit organization). In cases where your students could go into a myriad of fields, then select a workplace tasks (e.g., conducting a literature review) that could apply to multiple occupational situations or a profession that many students are likely to pursue.

Regardless of the venue or profession you select, the key is to identify a set of tasks that require the use of content knowledge from your target course (e.g., analyzing data from advanced optics experiments, cardiovascular system function, engineering drawing standards) – in other words, make sure that your definition of "skill" is the performance of a task that requires disciplinary knowledge addressed in the course being revised.

Table 7: Examples of detailed, discipline- and action-specific performance of key workplace tasks

Generic Skill	Real-World Use of Knowledge to Perform Key Tasks (i.e., Disciplinary Skill)
Oral Communication	Nurses carefully listen, observe, document in writing, and translate info about patient status among members of care team to ensure patient safety and shared understanding, especially conveying key information during shift changes.
Critical Thinking	Photonics technicians use old designs or customer requests, along with calculations (e.g., lens curvature) from specialized or even custom-made software to inform decisions about design, production and quality control.
Teamwork	Mechanical engineers regularly meet w/colleagues on teams to design and monitor projects; requires ability to clearly speak and listen, negotiate, and collaborate w/both technical and non-technical audiences.

* = only use generic labels as initial point of conversation – then discuss skills using new language of more detailed disciplinary and task-specific competencies.

Next, take it a step further and unpack this skill with even more specificity, particularly in the sequence of events that comprise the overall task. Think (or ask) about how the skill unfolds in real-world settings over time, even down to the most minute detail. Consider the very first step in how the skill is used and try to document each subsequent act, movement, or behavior that comes next. Add or refine your original definition accordingly, sparing no detail at this stage of skill articulation.

Then, think about other factors that impact how this skill is performed, with particular attention to things like the physical setting (e.g., emergency room, research/lab space, corporate office), the people involved and their respective role groups (e.g., technicians, surgeons, CEO, etc.), and other skills or knowledge required to complete the task. Also, as you further define your target skill, consider any cultural forces at play such as professional or disciplinary norms that may impact how the task is performed, or known biases or discriminatory beliefs that some co-workers may have about specific groups (e.g., race, gender, disability status, etc.). For some examples on the types of contextual factors you should be considering when defining the target skill, see Table 8 below.

Table 8. Examples of contextual factors that impact skill use

Real-World Use (i.e., Disciplinary Skill)	Notes on Factors Impacting Skill Use
Nurses carefully listen, observe, document in writing, and translate info about patient status among members of care team to ensure patient safety and shared understanding, especially conveying key information during shift changes.	Patient care team typically comprised of parties from different disciplines, professional training, gender and socio-cultural identities; locations of communication events are bedside or nursing station which impact how communications unfold.
Technicians use old designs or customer requests, along with calculations (e.g., lens curvature) from specialized or even custom-made software to inform decisions about design, production and quality control.	Tasks require good computational abilities and number sense, and willingness to learn industry-specific software; minoritized groups feel pressure to prove intelligence; documentation is key for problem-solving.
Engineers regularly meet w/colleagues on teams to design and monitor projects; requires ability to clearly speak and listen, negotiate, and collaborate w/both technical and non-technical audiences.	Engineering workplace is an oral, team-based culture w/ many meetings and presentations to both technical and general audiences.

It is worth elaborating on the issue of culture and bias here as you think about the skills you want students to acquire. Besides thinking about professional or disciplinary workplace norms, or biases that are documented and well-known (e.g., gender bias in video game design), as an

instructor you also need to consider your own views about what constitutes "good" or "proper" versions of these skills. For example, you or other instructors may have been raised to believe that good oral communication requires making eye contact with the other person(s), but this is simply not the case in all countries, cultures, professions, and situations around the world. So as you go through this exercise of considering cultural ramifications of how key skills are defined and used, also be honest and self-reflect on any biases or normative views you may have about these skills. With this information in hand, you can then decide whether these biases should be discussed in class and/or included in how you define and teach the skill to your students.[10]

Finally, note that this process is NOT about mapping skills to employer needs – yet. This is a commonly stated goal in higher education, but it is both a premature and inadequate goal for engaging in skills-focused teaching reforms. This is because these conversations tend to rely on generic, vague skillsets and/or sideline faculty and classroom instructors from ensuring that skill-related goals are properly linked to course content and disciplinary norms. Instead, let faculty take the lead on articulating key skills and then if desired, cross-check these with alumni or employer partners to see if they are consistent with workplace tasks. But the first point of reference should be disciplinary expertise and course curricula – not the voice and perspectives of employers alone.

Step 4: Identify course component to revise based on: (a) situational constraints of instructor time and curricular flexibility, and (b) existing (or new) lesson or assignment most aligned with targeted disciplinary skills

Now that you've defined the disciplinary skill you want students in the target course to learn, it's time to select a specific unit, assignment, or classroom activity to revise. Note that I'm not suggesting (or even mentioning) that you attempt to update an entire syllabus at this stage, which is an overreach for two reasons: (1) starting small ensures a manageable workload for the instructor, and (2) designing assignments or lessons around skills requires working at the micro-level of a discrete task and its associated content – a grounded, task-oriented approach that is not possible when operating at the macro-level of an entire syllabus with its myriad of foci and material. So resist the urge (or that of administrators or funding agencies) to revise an entire syllabus – or worse, an entire series of courses that make up a program – and just start small!

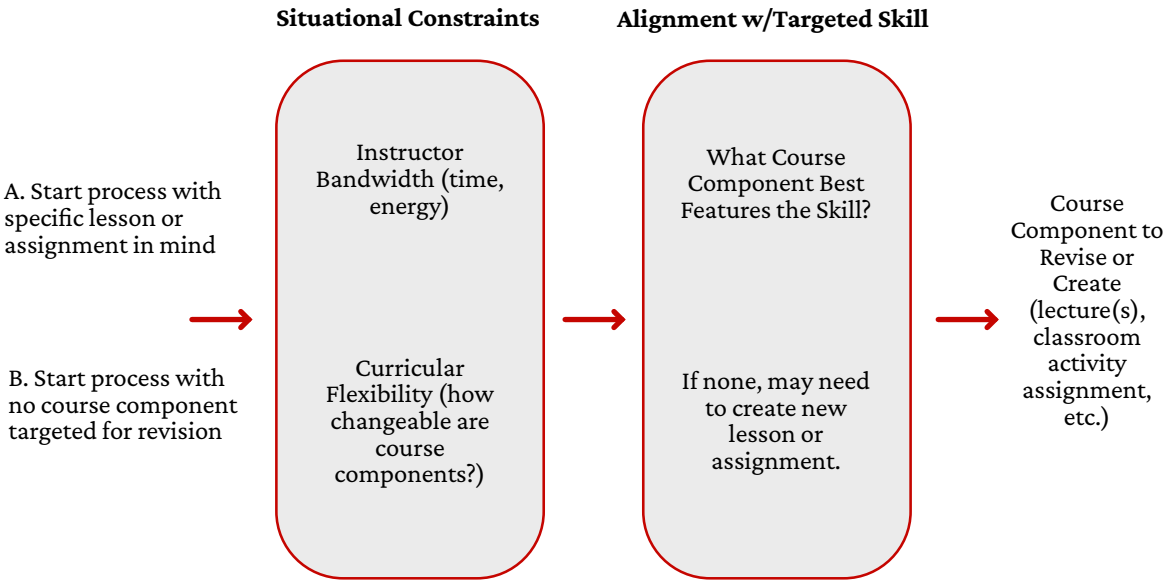
So what types of course components are we talking about here? Basically, you want to select a specific lecture, assignment, lab session, or classroom activity to work with that is feasible for you to revise, is available for revision, and that lends itself to a focus on your target disciplinary skill. The process for selecting the course component to revise is based on a combination of the well-known "backwards design" approach (i.e., design with learning goals foremost in mind instead of content coverage), insights from successful and failed curricular reforms (i.e., faculty bandwidth is limited, alignment between learning goal and activity is key), and practical experience.

The key here is that you should not select a lecture or assignment to revise without first carefully considering these critical issues of learning goals, feasibility, and curricular alignment. Now, you can of course begin the revision process with an assignment or series of lectures already in mind –

[10] This is a critical point given extensive research documenting how people's normative views of what constitutes appropriate or good "soft skills" frequently encode biases (or outright discriminatory views) about race/ethnicity, gender, disability status, and other identities (e.g., Moss & Tilly, 1996 for a famous example). Thus, the project of aggregating generic competency or skill attributes by identity group to account for variability across groups – as some organizations propose to do in the future – would potentially reify unexamined biases and reinforce stereotypes. Instead, aggregation of this type (by identity group) is a mistake, and efforts should center on carefully defining course-specific disciplinary skills with attention to cultural/group dynamics within those professional contexts.

perhaps you are being asked to revise specific aspects of the course, or maybe an assignment jumped out from the very beginning as a likely candidate for revision. In this case, you still need to subject this initial decision to a series of criteria to determine whether it is indeed a good fit. The process for identifying your course component is outlined in Figure 2 below.

Figure 2. Schematic of decision-making process for selecting a course component to revise



The first criteria for selecting your course component is one that is too often overlooked in education reform – that of the situational constraints facing the instructor and the specific course(s) being revised. Instead of imposing a new technique (e.g., active learning methods) onto a course or group of faculty in a top-down manner, it is better to first identify what changes are feasible and reasonable given the instructor's bandwidth and how flexible (if at all) the course really is. With information about these two constraints in hand, the prospects that subsequent revisions will be successful are significantly enhanced.

- **Instructor Bandwidth:** How much time do you and/or other instructors have to work on this project? If time and energy available to revise the course is extensive (e.g., a course "buy out" is available or you're on sabbatical), then working on a major assignment or a series of lectures makes sense. However, if instructor bandwidth is severely limited, then a much lighter touch (e.g., just discuss skills in a single lecture) makes far more sense. If bandwidth is limited, also strongly consider updating an existing lesson or assignment instead of creating one from scratch.

- **Curricular Flexibility:** How flexible is the curriculum for the course you're considering? If it is a low-enrollment graduate level course with only one instructor of record, then it is probably highly flexible and assignments and lectures can be easily changed. But if it's a high-enrollment undergraduate course that is required for multiple majors and involves a cast of instructors and TAs, then it likely is inflexible and changes would require multiple committee

meetings. Determining the curricular flexibility will delimit the range of possibilities for the size and scope of the subsequent revision process.

So identify your situational constraints, and then you'll know whether you have the time, energy, and curricular flexibility to do an extensive revision or whether it is better to adopt a less ambitious approach.

The second step involves reviewing the current (or proposed) course syllabi to identify existing assignments, units, lectures, or classroom activities that *already* feature an emphasis on key disciplinary skills. For instance, maybe there is a small-group discussion activity that implicitly cultivates collaborative reasoning skills, or an end-of-semester oral presentation where technical communication is emphasized. Such pre-existing course components that are already aligned with your targeted skill(s) should be at the top of the list for revision.

Alternatively, assignments or activities that do not have any obvious connection to key disciplinary skills should not be candidates for revision. In other words, don't impose a focus on communicating medical information among nursing teams into an activity or course unit focused on memorizing basics of diseases of the cardiovascular system with an important summative exam. Instead, look for an activity or unit that features group work, presentations, or simulations where communication is already being emphasized. If no such activities exist and you want to include a new emphasis on communication, then find the unit or activity that most lends itself to the insertion of a communication-centered activity.

Finally, as you review existing course elements with the targeted disciplinary skill in mind, begin to think about improvements that can be made to make the activity, assignment, or unit more explicitly focused on skills. At this early stage you don't need to identify specific changes or new teaching techniques yet but starting to identify shortcomings in the existing curricula and/or possible opportunities for discussing, demonstrating, and practicing your newly defined disciplinary skill likely will come to mind.

Ultimately, the key here is to narrow the range of possible course components to revise based on which ones already feature the skill or present natural opportunities for incorporating a new emphasis on skills. Of course, if you start this process and realize that the activity or assignment you selected isn't working out very well, you can come back to this step and select another activity.

To make this process more concrete, see Table X (below) for examples of some course components that faculty in my online PD course have worked on in the past, along with their decision-making process (situational constraints, assessment of alignment between target skill and pre-existing course element to revise) that led to this decision.

Table 9. Examples of course components selected by participants (and their decision-making processes) in online faculty PD

Course	New Disciplinary Skill Foci	Situational Constraints	Existing Course Component that Aligns w/ New Skill Foci	Potential Improvements to Make to Existing Activity or Unit
Intro to Public Health (Public Health)	Evidence based decision-making using community health assessment (CHA) data in multi-cultural contexts	Low bandwidth (pre-tenure); Low flexibility for curricular change (group taught course)	Lecture (1) on CHA and brief small group activity involves unstructured case analysis	Lecture insufficiently makes decision-making process visible for students; group work could be more structured, linked to lecture; new homework assignment possible
Revolutionary Lives (History)	Collaboration on historical research project w/focus on task delegation.	Medium bandwidth (has course buyout); High flexibility (primary instructor of record).	Conduct multi-week research in small group on revolutionary figure culminating in presentation and poster.	No previous discussion on group dynamics and task delegation has been problematic; little discussion of value of skills in professions.
Animal Health & Examination (Veterinary Science)	Diagnosing animal lesions accurately in high-pressure field situations w/ multiple parties present.	Medium bandwidth (on paternity leave); medium flexibility (group taught course but dept revising entire curriculum so course is changeable)	Lecture (1) on types of lesions and lab session (1) where students identify samples and individually take summative quiz.	Diagnostic decision-making not made transparent in lecture; lab doesn't replicate field setting (group decisions involved) and too fact-based .
Intro to Software Development (Computer Science)	Clear communication of problems in multi-disciplinary project IT teams.	High bandwidth (lead instructor, very motivated); medium flexibility (fixed curriculum)	None; instructor identified need to create new lesson and assignment.	Planned to create new small group project that featured sociocultural learning sequence.
Gas Metal Arc Welding (Manufacturing)	Work ethic and attention-to-details expected in professional manufacturing shop	High bandwidth (lead instructor); low flexibility (fixed and crowded curriculum)	None except for basic shop rules (e.g., cleanliness, safety)	Explained class was being run like a professional shop w/enforceable rules for being late, clean workspaces, etc.
Int'l Internship Orientation (Engineering)	Cross-cultural awareness for engineering students preparing to do int'l internships.	High bandwidth (department/lead advisor very motivated); high flexibility.	Two-hour module on general cultural norms in U.S. and England during orientation – no focus on workplace norms or specific skills (institution in South America)	Highlight known engineering-specific workplace norms (good and bad); explicitly discuss importance of navigating cultural differences

Step 5: Revise selected course component to highlight disciplinary skills through use of sociocultural learning sequence (i.e., lecture, modeling, practice, feedback)

Now that you've identified a specific lesson, unit, or assignment, it's time to make this learning opportunity a skills-focused powerhouse for your students! The core idea for doing so is to embed some (or all) aspects of the sociocultural learning sequence into your teaching, which views the learning of behavior and knowledge-driven skills as a gradual process of being introduced to a new cultural practice (e.g., Lave, 1996; Nasir et al., 2020). To review the sequence outlined on in an earlier section, research from across the disciplines (e.g., education, anthropology, learning sciences, psychology, medical education, etc.) indicates that people best learn real-world disciplinary skills through the following steps:

- **Lecture:** Tell the learner about the skill being taught, why it's important, and how it's connected to the task at hand. In classroom settings this is an important precursor to active engagement with the material and its corresponding skill, or what some call a "time for telling" (Schwartz & Bransford, 1988) and provides learners with key background information and motivation (and rationale) for subsequent learning. This is especially important when it comes to learning disciplinary skills, which some students may not view as useful, important, or relevant to the course or their education.

- **Modeling:** Just hearing about a skill or seeing it defined on a PowerPoint slide is not enough, as learners then need to see enacted in real-life via a demonstration, role play, or modeling of the skill – a process called vicarious learning (e.g., Rogoff, 2014). This is critical because many students have never seen the skill before, and until it is modeled before their eyes it remains an abstract idea. The enactment could be done by you (i.e., the instructor), a guest speaker (e.g., an employer), or even on a video. The modeling could also be done by just one person or a small group and can also include variations of the skill (e.g., good and bad, novice and expert, different contexts).

- **Practice:** A key element of any instruction focused on learning a new behavior or ways to perform a task (i.e., a disciplinary skill) is to practice it in a hands-on manner. This phase requires the instructor to design a learning activity that scaffolds the novice's enactment of the skill that was just demonstrated or modeled from easy and guided to more difficult and autonomous. Many techniques for actively engaging students in practicing the modeled skill on their own exist – often under the "active learning" label – with a key idea crafting opportunities for students to try, fail, and eventually succeed in using the new skill.

- **Feedback:** One of the primary ways that people improve upon past performance is through receiving specific feedback, and this is particularly true when it comes to tasks related to learning new professional ways of thinking and acting. While both formative and summative feedback can be used as part of sociocultural learning, providing learners with timely formative feedback is critical to help them refine and improve their performance, with summative assessments a secondary concern.

While ideally you can include each of these 4 elements into your activity or assignment, depending on your situational constraints and/or the nature of the lesson, that may not be possible or desirable. For instance, if time is severely limited you may only be able to briefly lecture about the value and nature of team-based communication in the ER and include a statement to this effect in your syllabus. With limited bandwidth you could also lecture and demonstrate how photonics technicians problem-solve in the workplace, with a brief round of feedback about different scenarios or approaches (e.g., poor, satisfactory, exemplary).

The fact that you can include just 1, 2, or 3 aspects of sociocultural learning underscores a key issue – this approach is flexible and you should adapt it to fit your situation, students, and your pedagogical skill level. But if time is not an issue and your course component is highly flexible and subject to revision, then it *is* ideal if you can include the full 4 steps of sociocultural learning. If a role-play simulation activity or a problem-based learning assignment that features communications in the ER or problem-solving in the photonics workplace could be created, that is the most rigorous way to help your students learn about, observe, and then practice this new way of thinking, acting, and reasoning in your field.

But this approach isn't all about active learning! While the "practice" element is critical – used alone without detailed explanation, modeling, and alignment with a specific type of practice, it is insufficient. Consider the limitations of assigning veterinary science students a case-study analysis of identifying lesions in the field without first explaining and then modeling what an experts' problem-solving process looks like in practice, and then with no critical feedback of their results. Such an assignment could potentially provide some practice with this particular disciplinary skill, but in isolation it would fail to adequately link the content to the skill, give students a concrete example of what type of reasoning they should be emulating, and opportunities for feedback from an expert that they can use for future improvement.

In other words, an active learning technique used without the lecturing, demonstration, and feedback elements of this approach is a wasted opportunity when it comes to sociocultural learning (i.e., disciplinary skills development). So, this step of adopting the sociocultural learning sequence requires a re-think about instructional design itself, and not simply the adoption of a "magic bullet" teaching technique.

With these issues in mind, the next step is to begin incorporating them into your activity or assignment by asking questions such as the following:

- **Where and how will you define and explain the disciplinary skill?** The first decision to make is when and how you'll lecture about the skill. This can take either written or verbal form and is simply where you define the disciplinary skill for your students and explain its importance and real-world applications. The exposition can be as long (or as short) as you like and is an opportunity to tell anecdotes from your own life and professional experience. In addition, consider what teaching materials you'll need to revise. If your course component is an assignment, then you'll want to update language in the syllabus about the role of skill(s) in the assignment, and then mention them in class when it is being discussed. But if you're revising a classroom activity, then your changes will be to the lesson plan and/or slides for that day's lecture, discussion, or lab meeting.

- **When and how will you demonstrate?** The modeling or demonstration phase can take many forms, and you will need to decide: (a) how much time to allocate to the demonstration, (b) who will do the demonstration (i.e., you, you and students, colleagues, videotaped actors), and (c) whether the demonstration will involve variations of the key skill (e.g., poor, mediocre, exemplary versions). While these demonstrations can be conducted briefly (e.g., 5-minutes) to give students an idea of the skill in practice, longer demonstrations that allow time for student Q&A and variations can be especially effective. Keep in mind that demonstrations of key skills are commonplace in disciplines where problem-solving is a core part of the curriculum (e.g., physics, chemistry), and in other fields can simply involve making more transparent how experts make decisions.

- **How will you enable students to practice what you just demonstrated?** This question involves the selection of some type of active learning technique, with its primary criterion being whether it allows students to practice the skill that you just demonstrated. These methods vary considerably from low (e.g., think-pair-share) to high (e.g., problem-based learning) demands on your time in terms of preparation and classroom timing, and thus should be selected with a close eye towards your situational constraints and comfort level using these techniques.

- **How and when will you provide feedback?** Finally, you'll need to decide how you'll provide feedback on students' performance of your targeted disciplinary skill (e.g., verbally, in writing, etc.) and when (e.g., in class, after class, privately). For large courses it may not be feasible to provide feedback to every student, and instead you can ask for volunteers to enact the skill and then be critiqued, or you can circulate around the room and give feedback to select groups or individuals. In these cases, all students should benefit from hearing you (as the expert) provide feedback, as they are all likely novices and could learn from your corrections or tips for improvement.

For the last stage of feedback, you may elect to approach this not as an informal, low-stakes form of assessment but as a formal evaluation of student performance. In these situations, I strongly urge you to create a customized rubric or other form of assessment tool that is unique to the disciplinary skill you have selected, instead of using a generic "soft skills" rubric (e.g., AAC&U Value Rubrics, NACE Career Readiness Inventory). Such tools are insufficiently detailed to capture nuances of your course content, task performance situations, institutional contexts, and cultural nuances of your students and profession.

Now, you may be wondering – what are the best teaching methods for teaching disciplinary skills that also aligns with the sociocultural learning sequence? While any form of active learning can be adapted to enable students to practice a disciplinary skill, there are some methods that are particularly well suited for skills-based learning that are worth considering such as **role-play simulations**, **small group discussions**, **peer instruction**, and **problem-based learning** to name but a few. These methods are not discussed in depth in this guide, however, as ample coverage of these techniques exists elsewhere and as noted above, the core idea here is to surround a hands-on experiential learning activity with lecture, demonstration, and feedback instead of relying on a single active learning approach in isolation.

For some concrete examples of ways to approach each of the four stages of the sociocultural learning sequence for both assignments and in-person classroom activities, and how much time (i.e., instructor bandwidth) is required for each one, see Table 10 below.

Table 10: Examples of assignments and classroom activity revisions for different stages of the sociocultural learning sequence

Type of Course Element Being Revised (and time required for revision)		
Sociocultural Learning Sequence	**Assignment**	**Classroom Activity**
Lecture	Define skill in syllabus as key learning goal (low time required)	Define and explain skill in early part of lecture (low time required)
	Specify skill as key part of assignment in syllabus (low)	Remind class of skill when discussing assignments (low)
	Real-world scenarios embedded in assignment (e.g., prompts, case studies) (medium)	Tell stories or anecdotes about skill (instructor, guest, video) (medium)
Demonstration	Include descriptions (and/or links to videos) of real-world skill use in syllabus and/or assignment (low)	Model skill in class (instructor, guest, students, video) and/or variations of skill in use (novice/expert) (medium)
	Provide written explanations of steps for analyses, logic, computations related to assignment (medium)	Perform steps of computation, problem-solving, logic, or other analyses while voicing decision steps for students (medium)
Practice		Think-pair-share or other brief, in-class small group exercises (low)
	Small/large group discussions can focus on course readings (medium)	Small group discussions (e.g., jigsaw, chat stations) or whole-class discussions (e.g., Socratic seminar) (medium)
	Role play simulations can be assignment with student performance of situation key part of grade (medium/high)	Student performance of role play/ simulation (can also be done online) (medium/high)
	Problem-based learning or other case-based projects (high)	Summative presentations (solo, group) of research or other projects (medium/high)
Feedback		Provide brief verbal feedback about demonstrated skill * (low)
	Develop custom rubric unique to evaluate student enactment or demonstration of targeted disciplinary skill (high)	Provide in-depth analysis of student performance in summative lecture on skills (low/medium)

* = if instructor bandwidth and curricular flexibility are low, you can skip the practice phase and just lecture, demonstrate, and provide feedback about your own (or others) demonstration of the skill(s).

Finally, it is critical to make sure that each component of your revised assignment or lesson – new skills-related learning goals, teaching methods, assignments or assessments – are aligned with one another such that the skills foci is clear throughout. Such curricular coherence is a simple idea, and rarely missed when it comes to content, as an exam or term paper is most likely going to be on material covered in lecture and assigned via homework. But the more nebulous notion of "skills" is more subtle and can easily be omitted from one or more of these course elements. This is where the idea of backwards design comes into play, where you start with your skill learning goal and specify (in writing preferably) how exactly this goal will be taught, learnt, and evaluated.

To help you with your course revision process and to ensure curricular alignment, the planning template on the next page should be used. This template has proven to be useful for faculty especially in the early stages of brainstorming new ideas for their courses. The first step in using the template is to define your disciplinary skill in detail, which should then serve as a constant reminder of the goal for your students' learning. Then, outline how each step of the sociocultural learning sequence will be used to achieve this goal.

Disciplinary Skills Approach Planning Template

Use this template to plan a course, classroom activity, lecture, or lesson plan where you want to highlight one or more disciplinary skills (e.g., teamwork/communication and its associated content). The Skills Definition Phase section is designed to help you articulate the key skill with sufficient detail (as opposed to relying on vague or generic descriptions of "soft skills" or "competencies"), while the Teaching Phase section will help you prepare specific classroom activities and ensure that they are "backwards designed" or aligned with your skills-related learning goals and other course elements.

Name of Lesson and Course: _____

Skills Definition Phase	
1. Describe the target skill in detail (Include skill and disciplinary content; describe use of skill from start to finish)	
2. Identify a typical location where the skill is used in the workplace (Describe where people use this skill - physical, technological, and geographic)	
3. Describe the people involved (Describe who is involved in skill use, including different roles/ identities and how they may impact skill use)	

The Teaching Phase (for planning specific classroom activities or lectures)	
1. Lecturing (Describe the nature/value of the skill for students – use detailed definition above)	
2. Demonstration (Describe how you will demonstrate how the skill is used in real-world settings)	
3. Practice (Use active learning to have students practice the skill – for ideas consult your campus Center for Teaching & Learning)	
4. Feedback (Provide formative feedback on their performance, being aware of your normative views)	

Curricular Revision Phase

Step 6: Update course materials (e.g., syllabus, lesson plans, lecture slides) with new skills-focused changes

After you have articulated new disciplinary skills as key learning goals and made your initial revisions to an existing (or brand new) course component, it's time to formalize these changes in writing. This is critical because many instructors re-use curricular materials (e.g., course syllabi, lecture notes, PowerPoint slides, Canvas websites) year after year, making updates to these materials imperative if you want the changes to be long-lasting. In addition, you likely will not be teaching the revised course forever but will hand it off to another instructor, making the documentation of revisions critical if these changes are to be long-lasting and sustainable.

This step may seem obvious, but many instructors use informal approaches (e.g., handwritten notes on old syllabi or lecture notes) and procedures when making updates or corrections (see Hora & Hunter, 2014). This means that changes, alterations, or improvements can easily be lost or not formally captured in writing, which can be especially problematic for courses taught in rotations as new instructors would not know about any updates or improvements.

Thus, take the information outlined in the planning template to formally revise any written curricular materials so that you, your students, and future instructors can now see the newly improved course component where disciplinary skills are highlighted. These updates may include the following:

- Updates to syllabus:
    - Add language to learning goals section and/or course description where you clearly state that disciplinary skills are a key learning goal – ideally, also define and explain why the skill is important;
    - Add language to any assignments or assessments where disciplinary skills are being featured and/or evaluated;
    - Add language to any lectures or lab meetings where disciplinary skills are a core part of the lesson or activity; and,
    - Consider adding an entirely new section on disciplinary skills where you elaborate on the nature of the skill being highlighted in the course, its relevance, and how/where it is being featured in the course. Otherwise, the above references to skills could be lost to students who are only skimming the syllabus.
- Updates to specific lessons:
    - Add language to any documents, PowerPoint slides, or hand-outs regarding skills for the course component that you've revised – include brief definitions of the disciplinary skill and its importance as a reminder for students; and,

- In the classroom or lab, verbally discuss the target disciplinary skill as the lecture portion of the sociocultural teaching sequence and also when discussing any assignments or upcoming activities.

Step 7: Re-convene key stakeholders to review progress and discuss next steps

The last step in this entire approach is simple – re-convene the original stakeholder group (or at least principal members and decision-makers) to review the revised course materials, reflect upon the pros/cons of the entire process, and to discuss any next steps within the department or program. This session is an opportunity not only for participating faculty to present their work but also to share reactions, ideas, and strategies for other instructors and the institution, department, program regarding curricular revisions around skills and career topics.

In other words, it's a venue for instructors to honestly reflect on how they felt the process went. Ideally the entire group will benefit from learning about the process, and if another round of revisions are planned, any insights regarding the first round should be applied to fix or improve future efforts – what is known in organizational development and management as "continuous improvement."

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