Human Capability Initiative
مبادرة القدرات البشرية

MINERVA

Teaching Durable Skills

How Universities Can Intentionally Build Critical Competencies

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برنامج تنمية القدرات البشرية Human Capability Development Program

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Introduction

As technology and global interconnectedness continue to evolve at an unprecedented pace amid the Fourth Industrial Revolution, the gap is widening between the skills employers say they need and those traditional education teaches. **In a 2022 study conducted by the global online recruiting company Monster, 91% of employers reported struggling to fill a position because of a skills gap, up by four percentage points from just a year earlier.** This gap will likely be compounded by the continued, rapid evolution of Augmented Reality (AR), generative Artificial Intelligence (AI) like ChatGPT, and robotics, that will render many of the technical skills students learn obsolete by the time they enter the workforce.

In addition to the reduced longevity of technical skill relevance, young workers are spending less time in each job, reducing their ability to amass role-specific experience. In 2022, the median tenure of workers ages 55 to 64 was more than three times that of workers ages 25 to 34 (9.8 vs. 2.8 years).

While technical abilities are still required for many roles, it is more crucial than ever that this generation be equipped with durable skills. We define durable skills — which can be grouped in broader competencies such as critical thinking, creativity, communication, and collaboration — as a set of skills that can be transferred across domains and contexts, and that endure, regardless of technological and sectoral evolution.

We intentionally use the term “durable” to distinguish it from a set of job-specific, technical skills that may become perishable over time. Past corporate vernacular has used terms such as “soft skills” or “human skills” or even “21st century skills” to describe a similar set of competencies. We believe that the transferability and the resilience of these skills is what makes them distinguishable from other skills, and thus our preference for that term.

Not surprisingly, with few exceptions, employers are seeking candidates with durable skills. In fact, a recent survey indicated that **seven out of the 10 most requested capabilities in job postings were durable skills**. However, university graduates continue to show up at the workplace without them.

Durable Skills: Overlooked in Higher Education

Institutions of higher learning should have an outsize role in producing graduates with durable, transferable skills. **If you ask most educators whether their institutions teach these skills, the answer will almost always be a resounding "yes". Yet, if you ask them to point out where in their curricula they teach these skills, few will be able to do so.** Even general education courses that focus on critical thinking or communication skills are typically offered within a single discipline and don't equip students to apply these skills in other contexts. Worse still, students are often left with the burden of piecing together courses that they hope will give them the right set of skills to succeed in a career and life. The University of Washington, for instance, offers more than 180 majors and around 1,800 courses each quarter. At large public universities that offer hundreds or thousands of courses, the onus is on students to navigate this complex web of classes, and infer what they should learn. With innovations like generative AI, universities should be even more intentional about teaching students skills like critical thinking and problem solving that will enable them to adopt and adapt to these technological innovations.

In addition, durable skills are not intentionally integrated into most degree programs. For instance, traditional business programs often do not teach students how to make decisions amid uncertainty, a challenge they are sure to face in their careers. Similarly, engineering majors rarely learn communications or negotiations skills, though they often have to manage and collaborate with others.

There are three main reasons why durable skills remain explicitly absent from most curricula:

A. They do not fit neatly into specific disciplines. Most institutions are organized in disciplinary silos and there are few opportunities (or incentives) to teach across them. This departmental barrier to collaboration makes it very difficult to teach skills that span disciplines, unless there is a centralized function to create and coordinate an interdisciplinary curriculum.

B. University courses are typically organized around topics and content. They focus on disseminating information, with assignments and exams oriented around retention of that information. A skills focus requires the redesign of course structures and lesson plans, orienting learning around the introduction, practice, and transfer of mental frameworks in every class, across courses, and in new contexts.

C. They are not explicitly identified in the curriculum and can be challenging to quantify and assess. Without a clear taxonomy of learning outcomes, assessing them becomes infeasible. It is not possible to teach or assess something that you have not clearly defined.

Given that durable skills typically cut across domains, teaching them requires that institutions break down traditional academic silos and employ an interdisciplinary approach to instruction. By practicing a skill in multiple and diverse contexts, students begin integrating this skill into their work and worldview, creating a "habit of mind". For instance, if a university wants to produce systems-level thinkers who can analyze network structures, students need to learn how to define the nodes and edges that constitute the system. A student who does this once, in a single discipline, is unlikely to be able to transfer that skill; but if the same student can practice analyzing networks in various contexts — for example, moving from social media networks to ecosystems, immune systems to the brain — they will be able to apply that skill in new and unfamiliar contexts at a future workplace. This means that the skill will endure and be transferable.

From Skills to Curricula

Integrating durable skills into a university curriculum requires a thoughtful process that includes aligning the institution's mission with its intended student outcomes, convening a multidisciplinary decision-making body, as well as responding to market forces and employer needs.

Following is a set of best-practices for higher education leaders, who want to intentionally and effectively teach durable skills at their institutions:

1. Establish a diverse group of stakeholders, who are invested in transforming the curriculum.

Include administrators and faculty from a wide range of backgrounds and disciplines. Individuals should be carefully selected for their expertise, openness to innovation, and willingness to create new, interdisciplinary programs. Make it clear that no individual department's needs will supersede any other's. Early discussions should include an acknowledgment from faculty that the skills traditionally taught in higher education are often a result of historical forces, rather than careful choices, and that classes offered are often a result of faculty's research interests, rather than the needs of students for their future employment opportunities. Getting buy-in from faculty early on about the importance of student-centricity and skills readiness is key. This will also set the stage for a program approval process that is more likely to be successful, as faculty governance can often be a major obstacle to institutional innovation.

2. Decide which durable skills to teach based on your institutional values and the educational goals you are trying to achieve.
Define which skills align with your institution's mission, as well as the needs of your graduates for the next 10, 20, and 30 years. Be mindful that you are focusing on skills that need to be useful against a rapidly changing global context, including social, political, environmental, economic, and technological shifts. For example, understanding the core principles of data structures and algorithms is more important than fluency in any particular coding language. While you want to be guided by employer needs, avoid including them directly in program decisions because each would have a narrow view of what their company or, at best, their industry. Instead, rely on large-scale data (such as this McKinsey study) to provide a broader view of the marketplace. Be wary of trying to satisfy everyone equally because stakeholders will inevitably push for the skills and courses most attractive to their departments, recreating history.

Seek input and encourage deliberation, but ensure the ultimate decisions are taken by visionary leaders, using predefined criteria.

3. Define the specific skills you want to teach and organize them in a hierarchy. Once you have consensus on the skills that are aligned with your institution's mission and objectives, and backed by market data, incorporate them intentionally into the curriculum, as well as the instruction and assessment approach.
Think of articulating a learning taxonomy, which is a hierarchy of the skills you want students to learn, accompanied by short definitions for each. These should be organized into competencies, sub-competencies, and learning outcomes. Competencies are broad areas of related skills, employing similar cognitive and behavioral aptitudes; sub-competencies are groups of complementary skills that are frequently practiced together; and, learning outcomes are specific skills that can be practiced and assessed individually.

For example, if your goal is to teach creative thinking, which is a broad collection of skills, you need to deconstruct the broad competency into more specific sub-competencies, such as ideation. These then need to be further broken down into a set of measurable outcomes, including using analogies to generate ideas and identifying constraints to frame the problem being solved.

Next, create a glossary of all the learning outcomes and their detailed descriptions. This can be a living document that explains more specifically what each learning outcome entails. Also, remember that not all will need to be taught program-wide. Identify which are crucial for all students and which are more specialized. For example, an ability to identify and mitigate biases is applicable to all fields, whereas quantitative analysis might be more relevant to learners in the computational and data sciences. Skills that are crucial for all students should be introduced intentionally early on in the program, so that all students have a foundation and shared language they can build upon with more specialized skills. Use these groupings to inform what will be taught and assessed in different courses, and at different times in the learning journey.

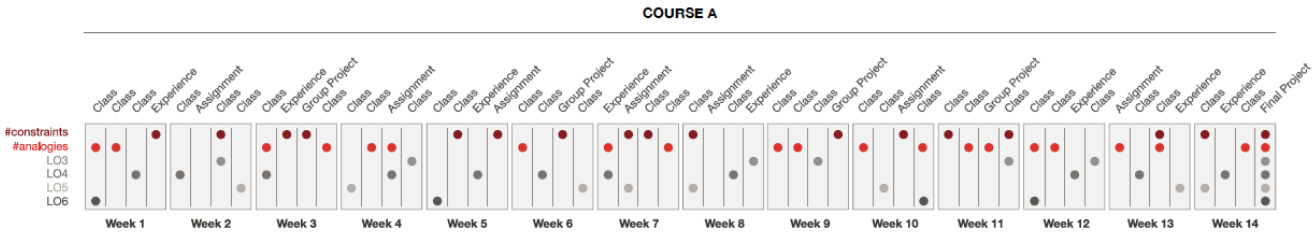
4. Create a curriculum map and the internal infrastructure to support it. Construct a map of the curriculum, detailing specific learning outcomes and the courses in which they are taught. This visual representation helps ensure that skills appear multiple times throughout the learning journey, being introduced, reinforced, and applied as learning progresses.

This structured approach encourages deliberate practice, a proven technique that helps students master skills through repetition and successive improvement.

Be mindful of program limitations when determining how many learning outcomes to incorporate in the curriculum; a single certificate program, for instance, will have different constraints than a 120-credit undergraduate degree.

Fig. 1
How Minerva Builds Learning Outcomes Within and Across Courses

A. Example learning outcome distribution across a single, 14-week course, including various learner touch points



B. Example showing distribution of a single learning outcome — #analogies — across four different courses

Definition of the learning outcome #analogies
Use analogies in problem solving appropriately.
We often reason by analogy, which requires comparing two things in specific ways in which they are similar (e.g., a human heart versus a water pump or the atom versus the solar system).

Consider appointing an academic lead, who has visibility across departments, to ensure that each learning outcome appears frequently in each course, and across courses. This lead is also typically responsible for tracking and measuring instructor assessment of the learning outcomes once the program is launched. Many institutions mistakenly allow degrees to become a hodgepodge of courses, with little connection to each other, taught by faculty who are not clear on what students have already learned. For instance, some degree programs have a general education curriculum that is dictated by student choice, instead of a set of courses that ensure all students receive the same foundational skills.

5. Train faculty to rethink how they develop lesson plans and assignments. Changing instructor mindsets may require a challenge to long-held beliefs about how a course should be developed. Instead of listing learning outcomes at the top of course syllabi, then developing assignments independently of that, consider integrating six to 10 learning outcomes in each course per semester. When developing class activities, faculty should be able to articulate how each directly addresses the skills they want students to learn, and to build the activities with increasing levels of difficulty. At first, students might be asked to define or recall a skill, then to evaluate it, and finally to apply it. In the example of thesis development, an instructor might ask students to read about techniques for writing an effective thesis before class. Class time could then be spent in small groups, comparing and contrasting different thesis statements, so students develop a shared understanding. This could be followed by a homework assignment, where students write their own statements to be critiqued in the next class. Finally, this skill could be assessed, among other communication skills, in an end-of-semester project.

Use this as an opportunity to reframe the instructional approach to be student-centered, doing away with lectures in favor of instructor-facilitated discussions. Encourage faculty to incorporate active learning and experiential activities, both of which have been shown to be effective practices for improving student recall and mastery skills.

6. Develop a system of assessment that directly evaluates the durable skills that have been identified.

Traditional assessment methods like tests, quizzes, and papers, in which students receive letter or numerical grades are problematic when evaluating the acquisition of durable skills for the following reasons:

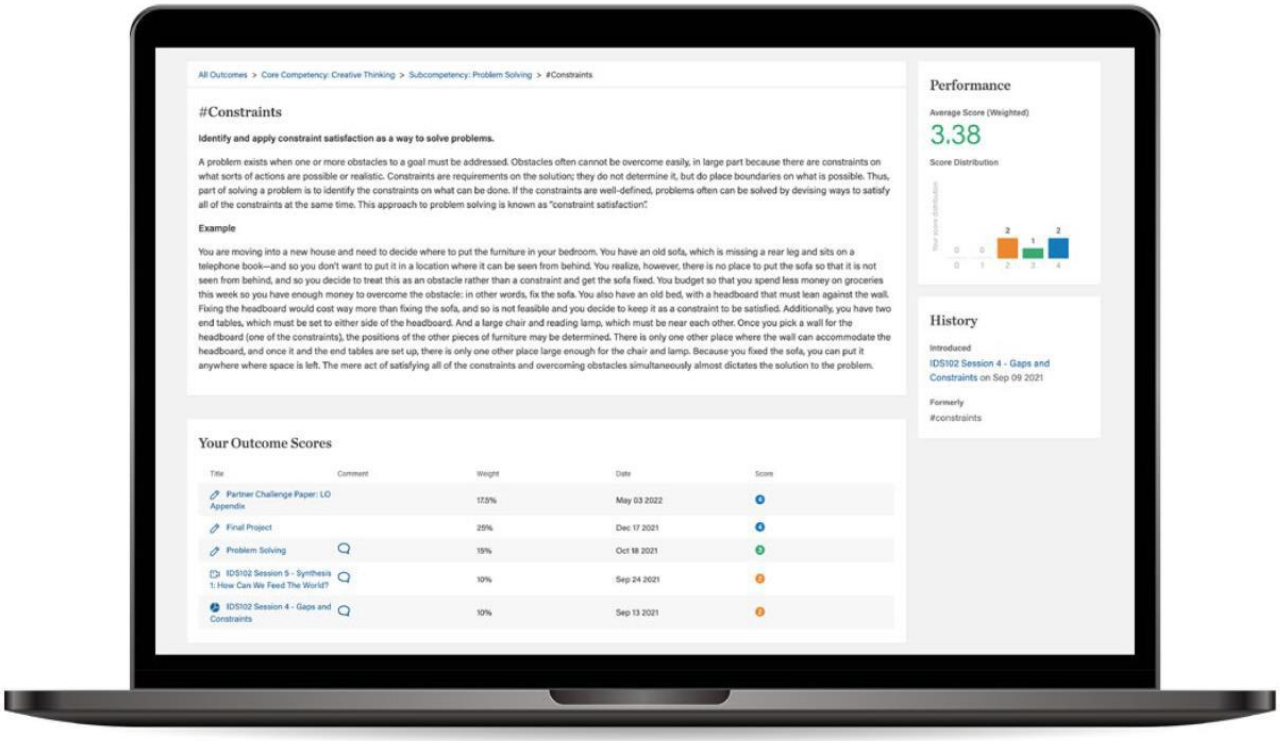
1. The grades they produce are composites and assign an overall score for performance. If a student receives a ”B” on a college transcript in a communications class, it is not clear what that grade represents. It could mean that the student has a strong grasp of grammar but cannot communicate oral arguments effectively to external audiences, or it could indicate that he or she had a good recall of information at the point where the final exam was administered but didn’t complete writing assignments on time. It is impossible to know.

2. Exams tend to be infrequent and high-stakes, which goes against the concept of deliberate practice. By having frequent, low-stake assessments, students receive more feedback which is crucial for improvement.

An effective assessment system for durable skills would ensure that learning outcomes are formatively evaluated in context, and it would use clear learning outcomes and scoring rubrics that repeat across courses. **When skills are assessed instead of assignments, instructors can provide multiple pieces of feedback within each course**, giving students more detailed advice on how to improve their application of those skills.

Fig. 2
How Minerva Defines and Tracks Learning Outcomes in Forum™

Example showing a student view of a single learning outcome (#constraints), in the Minerva learning platform, Forum™
Students can view a definition of the learning outcome and an example of how it might be applied in an assignment. They can also see where it was introduced, track its assessment across courses, and see an average of all students' scores. Rather than just receiving grades for a course, they are being assessed on how well they applied the skill across all courses and assignments.



The Urgency of Teaching Durable Skills

The message from employers and young workers is clear: Now more than ever, it is crucial for educational institutions to heed the call and prepare students with competencies that the workforce is actually demanding. Students, too, will reap long-lasting benefits, as they build more resilient professional lives and gain competencies that will enable them to move within or across industries more nimbly.

It is no longer enough to simply assume that students will absorb durable skills by osmosis. We need widespread change of curriculum design, teaching, and assessment in order to provide lasting value for students and employers.

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