Defining and Assessing Learning in Higher Education

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This contribution presents an overview of the Measuring College Learning (MCL) project, a faculty-led effort coordinated by the Social Science Research Council in collaboration with a set of national disciplinary associations to articulate essential learning outcomes and develop improved measures of undergraduate-level student learning in six academic disciplines. It begins with a description of the motivating forces behind the project, which include a desire to bring faculty voices and a focus on student learning to the fore of discussions about the desired outcomes of higher education. Next, it describes the core principles of the MCL project, its goals and activities, and lessons learned from progress on the project to date. It concludes with a summary of the six discipline-specific contributions that follow and some general recommendations for the future of assessment in higher education.

Introduction

The value of higher education is no longer taken for granted. Headlines asking, "Is college worth it?" pepper popular newspapers and public opinion surveys (see Davidson 2011; McArdle 2012; Williams 2012). Although the public regards higher education as important, the majority also questions whether it provides students with good value for the money invested.[1] Social science research documents the labor market value of college education— on average, college graduates fare better on a number of dimensions, from avoiding unemployment to having higher paying jobs (Hout 2012)—but questions remain about whether higher education could do more to prepare students to transition into life after college.

Policymakers, too, are asking questions about the value of college. In recent years they have subjected higher education to increasing levels of scrutiny and calls for accountability. Although accountability has been part of the state policy conversations since the early 1980s (Ewell 1994), recent trends of rising tuition, the economic challenges brought forth by the Great Recession, low and declining graduation rates, and indications that college students may not be developing crucial 21st-century skills such as critical thinking and problem solving have raised accountability concerns to a new level, including getting the attention of the federal government.[2] The Spellings Commission, a U.S. Department of Education

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[1] A recent Pew survey reported that 57 percent of Americans believe that the higher education system in the United States fails to provide students with good value for the money they and their families spend (Taylor et al. 2011).

[2] For evidence regarding declining graduations rates, see, for example, Astin and Osegura (2005) and Bound, Lovenheim, and Turner (2010). For evidence regarding limited development of general collegiate skills such as critical thinking, see, for example, Arum and Roksa (2011, 2014a).

taskforce on the future of postsecondary education, recommended implementing "serious accountability measures" in higher education, including creating a "consumer-friendly information database" (U.S. Department of Education 2006, 21–22). These recommendations were used to develop the College Scorecard and a proposed, but subsequently abandoned, federal college ratings plan.[3]

Higher education leaders have been quick to critique these kinds of external accountability measures. There is indeed reason to be cautious about the College Scorecard, the now abandoned ratings plan, and other external accountability measures, especially given the lessons learned regarding the pitfalls of accountability in K–12 education. Critiquing proposed endeavors, however, falls short of offering a vision for the future of higher education. Rather than making their own case for higher education, today's leaders have often focused on defending it based on the terms advanced by policymakers, which typically means engaging in debates about externally proposed metrics, such as cost, wages, or loan default rates. The National Governors Association, for example, recently reduced higher education to primarily one metric: preparing students for high-paying, high-demand jobs (Sparks and Waits 2011).

Clearly, higher education can help to support students' labor market aspirations, but it offers much more than workforce training. At its best, college prepares students for participation in a democratic society and provides enriching contexts for personal growth and development. Even when it comes to professional development,

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[3] For the College Scorecard, see https://www.whitehouse.gov/issues/education/higher-education/college-score-card; for the college ratings system, see https://www.whitehouse.gov/the-press-office/2013/08/22/fact-sheet-president-s-plan-make-college-more-affordable-better-bargain-. The federal college ratings plan, proposed in 2013, was abandoned in June 2015 (http://chronicle.com/article/Education-Department-Now-Plans/231137/). For some examples of responses to the proposed college ratings system, see Field (2014) and Blumenstyk (2014).

it would be shortsighted to focus narrowly on providing training for short-term gains. Rather, colleges should develop in students a passion for learning and discovery and help students develop higher order skills and attitudes that will foster long-term professional success. After all, surveys of employers repeatedly highlight the need for broader competencies such as critical thinking and problem solving and not job-specific skills (AAC&U 2008; NRC 2012). Higher order skills are necessary in a globalized world that is experiencing rapid technological change, where many tasks and challenges that graduates are likely to face in their personal, civic, and professional lives may not yet exist.

The absence of a more expansive vision of higher education in policy debates has various roots. Given the complexity of what higher education institutions aim to offer, there is a great deal of normative disagreement around desirable outcomes (Arum and Roksa 2014b). But perhaps more notable than this disagreement is the fact that faculty voices are often largely absent from conversations about the outcomes that higher education should accomplish. Without faculty voices, policy debates are overlooking what should arguably be the core function of higher education: student learning.

But even if faculty were a larger part of the discussion, they would find it difficult today to identify high-quality, comparable measures to demonstrate what students were actually learning. Measuring graduation rates and early-career earnings, though not without challenges, is much easier than measuring student learning, given the absence of agreed upon measures. A few high-quality measures of generic competencies like critical thinking have been developed in recent decades, but the development of discipline-specific[4] (i.e., major-specific, domain-specific, or field-specific) measures lags substantially behind. Many of the currently available discipline-specific

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[4] We use the term *discipline* in this paper interchangeably with *field*, *domain*, and *subject*, although some scholars prefer to use the term more restrictively (see Abbott 2001).

measures focus on content knowledge or lower levels of abstraction, outcomes not compatible with faculty goals. This lack of high-quality discipline-specific measures is a significant problem, especially in light of the fact that many faculty and students place a great deal of value on discipline-specific teaching and learning.[5]

Engaging in conversations about the outcomes of higher education, and in particular placing *faculty* and *learning outcomes* at the center of these conversations, is not easy. Nonetheless, we believe strongly that faculty have a crucial role to play in defining appropriate outcomes for higher education and in facilitating the development of tools that will accurately measure those outcomes. The fact that conversations about higher education outcomes and how to measure them are fraught with difficulties makes it that much more important for higher education faculty to contribute, and indeed, lead the way, especially when it comes to defining and measuring what students should be learning.

Faculty care deeply about what students are learning. They spend a substantial portion of their professional lives thinking about what students should learn, organizing classroom activities to facilitate learning, and assessing what students have learned in their courses. Beyond assessment in their individual courses, faculty care about what students are learning in their major, what they are learning outside of their major, and how well they can apply that learning to life beyond college. Being able to assess what students are learning is central to understanding what students know and are able to do. It is also central to understanding how to improve instruction in the future. Assessment can provide insights into which pedagogical practices and curricular structures are best

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[5] Indeed, as others have pointed out, "most postsecondary faculty have strong disciplinary identities, and view themselves as teaching particular content, and not 'generic' thinking and reasoning skills" (Pallas 2011, 215). Similarly, most undergraduates' academic identities are tightly linked to their major field(s) of study (Pitt and Tepper 2012).

poised to accomplish the goals faculty set for their students. Assessment can thus be beneficial for helping faculty and departments engage in evidence-based instructional improvement efforts.

Being able to clearly articulate and demonstrate what students are learning can have benefits beyond the classroom and specific departments. At the system level, improved assessments could make it possible to craft larger scale, learning-centered transfer articulation agreements, something that could save students and institutions time and money and increase college completion rates. At the labor market level, students could use improved assessments to demonstrate their competencies to employers, or employers could use them as a way to identify talented and capable candidates from across a variety of institution types.

The Measuring College Learning (MCL) project has aimed to provide a platform for faculty to engage in national conversations about student learning and assessment. Over the past two-plus years, faculty participants in the project have thought long and hard about the essential 21st-century competencies, conceptual knowledge, and practices that students in their disciplines should develop in college. Each of MCL's six discipline-specific faculty panels produced a white paper that clearly articulates a set of learning outcomes[6] for students in their discipline, providing

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[6] In the teaching, learning, and assessment literature, there is some level of debate over the distinctions between various learning-related terms, such as *learning objective* and *learning outcome*. Some scholars argue that learning objective should be used to refer to *desired* learning, whereas learning outcome should be used to refer to *actual* learning. Others prefer to use the term learning outcome to refer to both desired and actual learning because it is thought to reflect a more student-centered orientation to education—it emphasizes results over targets. Many feel that it is also simpler to use a single term instead of two very similar terms. In the MCL project, most faculty panelists expressed a moderate preference for the single-term approach. In general, this preference is reflected in the six MCL white papers.

a roadmap for departmental and disciplinary conversations about what undergraduate-level students should be expected to learn. Moreover, the white papers put forth disciplinary principles for learning outcomes assessment, illuminating the characteristics of assessments needed to capture the complex knowledge and skills that are at the heart of learning in higher education. This book, a compilation of the six MCL white papers, is a unique opportunity to hear faculty voices as they engage in the difficult work of defining and measuring learning outcomes in their disciplines.

Core Principles of the Measuring College Learning Project

Aiming to counter the absence of faculty voices from public debates about higher education outcomes, the first principle of the MCL project is this:

> Faculty should be at the forefront of defining and measuring undergraduate-level learning outcomes.

Bringing faculty together to engage in these kinds of efforts is crucial not only to help avoid the narrow focus on outcomes over which colleges have only limited control (e.g., early post-graduation wages) but also to steer the conversation to the core of higher education: teaching and learning.

With the centrality of faculty comes a focus on students, which leads to the second core principle of MCL:

> Students from all backgrounds and institutions should be given a fair opportunity to demonstrate their knowledge and skills.

Many social scientists and policymakers subscribe to the idea that higher education helps to enhance individuals' knowledge and

skills (i.e., human capital) (Becker 2009). However, today's students are limited in their ability to demonstrate their human capital when it matters most. For example, many students and recent graduates find it difficult to convey adequately what they know and are able to do to prospective employers. Indeed, decades of course diversification and grade inflation have given rise to a situation where employers rarely ask to see college transcripts, leaving students with little verifiable and transferable evidence of their learning.[7] To give another example, many students encounter significant obstacles when attempting to transfer course credits from one institution to another. Colleges and universities themselves demonstrate skepticism of student transcripts, often challenging and limiting credit transfer based on course titles and grades from other institutions. Regardless of their backgrounds or institutions attended, we believe that students should have opportunities to demonstrate what they know and are able to do when transferring from one academic institution to another or when attempting to transition into the labor force. Designing measures that can be used for multiple purposes—institutional improvement, credit transfer, and demonstration of knowledge and competency—is very challenging, but the benefits to doing so outweigh the costs. Indeed, when students understand that an assessment could benefit them directly, they are more likely to be motivated to do their best, thus providing the most accurate indication of their knowledge and skills.

Recognizing the complexity of knowledge and competencies developed in higher education leads to the third core principle of MCL:

> Any single measure of student learning should be a part
> of a larger holistic assessment plan.

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[7] Just over a third (37 percent) of recent college graduates reported that employers asked to see their transcripts (Arum and Roksa 2014a, 74).

Even focusing exclusively on academic learning produces a long list of concepts and competencies that students should be expected to acquire in higher education, including a range of generic competencies, discipline-specific concepts, and civic and intercultural competencies. No single instrument can capture all of these outcomes, and even within specific domains different instruments may capture different dimensions of learning. Thus, to ensure that students are developing across a number of important domains and that assessments reflect the true complexity of learning, a variety of instruments are needed. The assessment tools that may be developed based on the insights of the MCL project need to be supplemented with other assessment strategies, including the evaluation of authentic student work through the use of grading rubrics, such as the Association of American Colleges and Universities' VALUE rubrics, which are currently being piloted by institutions across the country.[8]

Using a variety of instruments can also facilitate a focus on institutional improvement. Different institutions may emphasize different dimensions of student learning, and a single institution may emphasize different dimensions at different points in time. Defining and measuring an array of learning outcomes allows for a virtuous cycle of improvement: Initial measurement provides an indication of where students are, thus illuminating to faculty which areas need attention. As departments and programs change their curricula and instructional practices to improve outcomes, follow-up assessments can provide evidence of improvement or suggest other areas in need of attention.

This focus on improvement leads to MCL's fourth core principle:

> Institutions should use assessment tools on a voluntary basis.

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[8] For more information on the VALUE rubrics and the recent multistate pilot project, see https://www.aacu.org/value/rubrics.

Externally imposed accountability is undesirable and would likely be counterproductive (see Arum and Roksa 2011, 2014a). The complexity of higher education, including the diversity of goals and institutional types, makes it likely that external accountability would not be effective or productive in terms of improving student outcomes (see also Roksa 2015).

The final principle of the MCL project is this:

> Measures of student learning should be rigorous and high quality and should yield data that allow for comparisons over time and across institutions.

A growing number of institutions and higher education agencies are working internally to assess and improve student outcomes. Many are also creating coalitions and consortia that involve sharing data on student outcomes.[9] Through these voluntary collaborations, institutions aim to learn from each other about best practices and effective ways of improving student learning. Instruments developed to assess student learning outcomes need to facilitate these conversations and support continuous engagement in institutional improvement.

Goals and Activities

The MCL project began in 2013 under the auspices of the Social Science Research Council as an opportunity to engage faculty in conversations about student learning outcomes and assessment in

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[9] Not all institutional collaborations measure student learning (e.g., Western Interstate Commission for Higher Education), but some do (e.g., Higher Education Data Sharing Consortium and the New England Consortium on Assessment and Student Learning).

their disciplines. Over the course of two-plus years, panels of faculty from six academic disciplines—biology, business, communication, economics, history, and sociology—engaged in a series of forward-thinking and consensus-driven discussions about their priorities for student learning and their vision for the future of learning outcomes assessment. The six MCL disciplines were chosen to represent the intellectual diversity of the higher education system, from the traditional arts and science fields to the professional fields. Collectively, they account for over 35 percent of the bachelor's degrees that are granted each year in the United States.[10]

Each MCL faculty panel brought together ten to fifteen individuals, selected on the basis of their dedication to undergraduate education and their expertise in defining and measuring learning outcomes. Table 1.1 provides a complete list of MCL faculty panelists. During the selection process, we worked closely with the disciplinary associations or their equivalents in each of the six disciplines to identify a group of faculty who met these criteria. Working closely with the disciplinary associations and related entities during the selection process and throughout the project has been critical to the success of our efforts because they have an unparalleled understanding of the state of their fields and faculty leadership in specific domains.

We strove to ensure that each MCL panel was representative of a wide range of institutional types, geographic locations, and subfields. In the end, most of the panelists hailed from four-year institutions, but some of them were community college faculty members and disciplinary association leaders. Notably, the majority

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[10] This figure was calculated using Tables 313 and 364 of NCES's *2012 Digest of Education Statistics* (Snyder and Dillow 2013). The individual disciplines break down as follows: business (21.3 percent); biological and biomedical sciences (5.2 percent); communication, journalism, and related programs (4.9 percent); history (2.0 percent); sociology (1.7 percent); and economics (1.7 percent).

Table 1.1 MCL Faculty Panelists

Discipline	Name	Institutional Affiliation
Biology	Cynthia Bauerle	Howard Hughes Medical Institute
	Sara Brownell	Arizona State University
	Clarissa Dirks*	The Evergreen State College
	Chris Kaiser	Massachusetts Institute of Technology
	Jennifer Knight*	University of Colorado, Boulder
	Susan Singer	National Science Foundation
	Michelle Smith	University of Maine
	Nancy Songer	Drexel University
	Gordon Uno	University of Oklahoma
	William Wood	University of Colorado, Boulder
	Robin Wright	University of Minnesota
Business	Sara Beckman*	University of California, Berkeley
	Thomas Calderon	University of Akron
	Lynn Doran	Georgetown University
	Anne Greenhalgh	University of Pennsylvania
	Doug Guthrie	George Washington University / Apple, Inc.
	Kathleen Krentler	San Diego State University
	Kathy Lund Dean	Gustavus Adolphus College
	Jeff Nesteruk*	Franklin & Marshall College
	Claire Preisser	The Aspen Institute
	Robert Reid	Association to Advance Collegiate Schools of Business
	Paige Reidy Soffen	The Aspen Institute
	Scott Romeika	University of Pennsylvania
	William Sullivan	Wabash College
	Karen Tarnoff	East Tennessee State University
	Lynn Wooten	University of Michigan, Ann Arbor

Discipline	Name	Institutional Affiliation
Communication	Walid Afifi	University of Iowa
	Timothy Barney	University of Richmond
	Steven Beebe*	Texas State University
	Pat Ganer	Cypress College
	Nancy Kidd*	National Communication Association
	Joseph Mazer	Clemson University
	W. Bradford Mello*	Saint Xavier University
	Kevin Meyer	Illinois State University
	Trevor Parry-Giles*	National Communication Association
	Ken Sereno	University of Southern California
Economics	Sam Allgood*	University of Nebraska, Lincoln
	Amanda Bayer*	Swarthmore College
	Stephen Buckles	Vanderbilt University
	Charles Clotfelter	Duke University
	Melissa Famulari	University of California, San Diego
	Rae Jean Goodman	United States Naval Academy
	Mark Maier	Glendale Community College
	KimMarie McGoldrick	University of Richmond
	John Siegfried	Vanderbilt University
	William Walstad	University of Nebraska, Lincoln
	Michael Watts	Purdue University
History	Julia Brookins	American Historical Association
	Lendol Calder*	Augustana College
	Elaine Carey	St. John's University
	James Grossman	American Historical Association
	Anne Hyde	Colorado College
	Norm Jones	University of Utah
	Kenneth Pomeranz	University of Chicago
	Nancy Quam-Wickham	California State University, Long Beach
	Tracy Steffes*	Brown University
	Maris Vinovskis	University of Michigan, Ann Arbor
	Emily Swafford	American Historical Association

Table 1.1 *(Continued)*

Discipline	Name	Institutional Affiliation
Sociology	Jeanne Ballantine	Wright State University
	William Carbonaro*	University of Notre Dame
	Paula England	New York University
	Susan Ferguson*	Grinnell College
	Sally Hillsman	American Sociological Association
	Katherine McClelland	Franklin & Marshall College
	Matthew McKeever	Mount Holyoke College
	Aaron Pallas	Columbia University
	Richard Pitt	Vanderbilt University
	Margaret Weigers Vitullo	American Sociological Association
	Theodore Wagenaar	Miami University
	Sarah Willie-LeBreton	Swarthmore College

*White paper coauthors

of panelists have been or currently are involved in other faculty-led efforts to articulate and measure learning outcomes. This deep familiarity with related efforts greatly contributed to the project, ensuring that it built on and productively extended previous and ongoing endeavors.

Each of the MCL panels drew on a multitude of prior and ongoing initiatives related to student learning and assessment. For example, the biology panel benefited from decades of important efforts to improve the quality of biology education, including a recent American Association for the Advancement of Science (AAAS) report, *Vision and Change in Undergraduate Biology Education: A Call to Action* (2011). To give another example, the history and communication panels relied on ongoing national efforts to articulate learning outcomes for their disciplines

through Tuning.[11] All six panels also benefited from insights about learning outcomes and measurement put forth by organizations such as the Association of American Colleges and Universities (AAC&U) and the National Institute for Learning Outcomes Assessment (NILOA).[12]

MCL panelists worked to pull together and synthesize insights from decades of prior work, but they also strove to be uniquely forward-thinking in their efforts. One of the key ways MCL differs from other efforts is in how it articulates learning outcomes. Following an example set by the discipline of biology, faculty in each of the MCL disciplines have organized their top priorities for student learning into a set of *essential concepts* (i.e., complex ideas, theoretical understandings, and ways of thinking central to the discipline) and *essential competencies* (i.e., disciplinary practices and skills necessary to engage effectively in the discipline). Broadly speaking, essential concepts and competencies are *ideas* and *practices* that faculty believe are fundamental to the discipline, valuable to students, and worth emphasizing given limited time and resources. The essential concepts and competencies articulated in the MCL white papers should not be seen as fixed, universal, or comprehensive. Rather, they aim to be reasonable and productive frameworks that can orient departmental and disciplinary discussions about learning, assessment, and institutional improvement.

The MCL panels have focused on articulating a limited number of essential concepts and competencies, as opposed to a comprehensive set of learning outcomes, for a couple of reasons. First, given that MCL strives to inform evaluation and program design

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[11] For information on Tuning, see http://www.luminafoundation.org/dqp-and-tuning.

[12] For AAC&U LEAP Initiative, see https://www.aacu.org/leap, and for NILOA endeavors see http://www.learningoutcomeassessment.org/NILOAResources.html.

efforts nationwide, it is important to emphasize concepts and competencies that resonate with as many faculty as possible, regardless of subfield or institution type. Second, keeping in mind that the goal of MCL is to provide resources to support improved measurement of learning outcomes, articulating a relatively manageable number of concepts and competencies makes it less daunting for faculty to think about incorporating them into their deliberations and assessment efforts.

The other notable way MCL differs from prior endeavors is by engaging faculty in conversations about assessment. MCL panels not only articulated learning outcomes but also aimed to identify key principles of assessment in their disciplines by investigating the following questions: What kinds of discipline-specific assessment resources are currently available, and how are they being used? To what extent do existing resources meet faculty members', students', and other stakeholders' needs? Do they align with the concepts and competencies the panel has identified? Looking to the future, what kinds of assessment tools should be built for—and by—the discipline, and how should they be used? In the end, each of the MCL faculty panels has articulated a series of principles for assessment, illuminating the qualities that assessments need in order to capture the concepts and competencies that faculty, students, and others value. These principles move the assessment conversation in each of the MCL disciplines forward in important ways, highlighting a clear path forward for faculty, disciplinary associations, and assessment designers.

What We Have Learned: Lessons from MCL

The first thing we learned, which may come as a surprise to audiences both inside and outside academia, is that faculty, to a large extent, readily agree on what students should learn in higher education. In particular, when focusing on their own disciplines—on what students should learn in their majors—there is a substantial

amount of agreement.[13] This surfaced early on in the MCL project and in other endeavors such as Tuning. It may be difficult to list everything students should know and be able to do, but when faculty are asked to focus on essential elements they are quite ready, willing, and able to define priorities for student learning in their disciplines.

Across all six MCL disciplines, faculty have emphasized the importance of moving beyond learning content for content's sake (i.e., memorization and regurgitation). To be sure, content is crucial, but not in the form of facts that can be memorized. Rather, content matters insofar as it serves as a building block for more complex forms of thinking. Indeed, faculty are eager to move beyond the basic levels of Bloom's taxonomy, including remembering and simple forms of understanding, where many current assessments in higher education reside.[14] They are focused on getting students to apply, analyze, and evaluate from their disciplinary perspectives. By the time students graduate, faculty also believe that students should be able to operate at the highest level of Bloom's taxonomy—to create—often in the form of asking and answering research questions, even if only in relatively rudimentary forms.

In moving beyond content knowledge, faculty in each discipline have been able to identify a set of essential concepts and competencies. This conceptualization of learning outcomes as existing at the intersection of concepts (what students know and understand) and competencies (what students are able to do) draws extensively from the *Vision and Change* document produced by faculty in biology (AAAS 2011). Given the focus of each discipline on selecting a limited number of concepts and competencies,

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[13] There is also agreement with respect to generic competencies with faculty being almost unanimous on the importance of critical thinking (Bok 2006).

[14] On Bloom's taxonomy and recent revisions, see the 2002 Special Issue: Revising Bloom's Taxonomy, *Theory Into Practice* 41, no. 4.

the concepts identified at times reflect more general topic areas or themes. In most cases, more specific concepts can be said to underlie these broader topics or themes. At their core, the essential concepts that faculty have articulated aim to capture theoretical understandings and ways of thinking. Competencies, on the other hand, reflect the ways of doing the discipline, or the skills necessary to engage effectively in the discipline. Collectively, concepts and competencies reflect the habits of mind and practices that are characteristic of the discipline. Although the faculty panels were not explicitly asked to address values, the concepts and competencies identified in many ways reflect disciplinary values by revealing what faculty in the discipline believe is valuable and important. With regard to values in the more traditional sense (i.e., civic engagement and ethical reasoning), some disciplines explicitly included these in their definitions of discipline-specific learning outcomes.

The six disciplines participating in the MCL project varied in the extent to which they had engaged in organized efforts to define learning outcomes before MCL. Each of the disciplinary white papers in this volume describes prior efforts and the ways the MCL project builds on and extends those endeavors. Variation observed across disciplines—in terms of whether and how faculty have engaged in organized discussions about learning outcomes—in part reflects the activities of disciplinary associations or their equivalents. Some disciplines, such as biology, do not have one overarching disciplinary association and are divided into many associations representing different subdisciplines. Robust National Science Foundation (NSF) funding, along with the establishment of faculty-led groups like the Society for the Advancement of Biology Education Research (SABER), however, have helped to propel biology as a discipline into extensive discussions of student learning. Economists, on the other hand, have a disciplinary association, the American Economic Association (AEA), which as a whole has been less engaged in questions surrounding learning;

instead, this conversation has been largely confined to the AEA's Committee on Economic Education. Other disciplines, such as history, sociology, and communication, have national associations—the American Historical Association, the American Sociological Association, and the National Communication Association—that have recently been very active in organizing conversations regarding student learning outcomes.

Despite vastly different starting points, resources, and institutional structures, all of the MCL disciplines were able to identify essential concepts and competencies, define them precisely, and offer concrete examples of desired outcomes. Even when faculty did not have many endeavors preceding MCL to use as building blocks, they were able to coalesce rather quickly around key learning outcomes in their respective disciplines. The amount of consensus and the level of detail provided in the respective white papers speak to the extent of thinking about student learning that has been occurring in higher education, often under the radar. Indeed, we have found that faculty are quite reflective and thoughtful about student learning outcomes, even if this does not always get mentioned or recognized at their institutions or mobilized and articulated through larger national endeavors.

One of the challenges we anticipated and worked on throughout is the overlap between discipline-specific and generic competencies. Given a number of already existing endeavors and measures aimed at capturing generic competencies, we urged the MCL panels to focus on discipline-specific knowledge and ways of thinking. The concepts that emerged through the MCL project are clearly discipline specific, but the competencies, although embedded in the disciplines, tend to resonate with other, often generic ones like critical thinking, analytical writing, quantitative reasoning, and problem solving.

Scholars of teaching, learning, and assessment have long been engaged in conversations about the extent to which certain higher

order skills, such as critical thinking, are generic and can be measured in the absence of specific domains. Lee Shulman (2004a, 2004b), for example, is well known for emphasizing the importance of disciplinary knowledge. Liu, Frankel, and Roohr (2014) offer a compelling review of the debate, considering a range of perspectives, from those who see critical thinking as truly generic and thus possible to teach outside of the context of a specific discipline to those who argue that critical thinking is a domain-specific skill that cannot be automatically transferred from one domain to another.

Notwithstanding this debate, college-level courses are, by and large, discipline specific. This means that students, to the extent that they are developing broader skills such as analysis, writing, and critical thinking, are developing them in discipline-specific contexts. Learning how to think critically, write analytically, and problem solve in the disciplines is crucial, not only because it will enable students to be skilled disciplinary actors but also because it will give them a foundation that can then potentially be transferred to a range of other domains. Whether and how this transfer across domains can occur requires careful attention and is a worthy topic for further research (Koenig 2011). The contribution of the MCL project to this debate is to illuminate the connections between generic and discipline-specific competencies and to highlight how disciplinary ways of thinking align with broader concerns about developing students' ability to analyze, integrate, and problem solve.

All major efforts to articulate student learning outcomes agree about the importance of developing both discipline-specific and more generic competencies that could potentially be transferred across domains of knowledge. For example, both AAC&U's Liberal Learning and America's Promise (LEAP) and Lumina Foundation's Degree Qualifications Profile (DQP) include a category for subject-specific knowledge (referred to as "knowledge of human cultures and the physical and natural world"

in LEAP and "specialized knowledge" in the DQP). MCL's essential concepts in each discipline aim to provide specific guidance regarding the knowledge students should acquire in each discipline (Table 1.2).

Table 1.2 Essential Concepts and Competencies from the Six MCL Disciplines

Discipline	Essential Concepts	Essential Competencies
Biology	• Evolution • Information Flow • Structure & Function • Pathways & Transformations of Matter and Energy • Systems	• Model • Apply Quantitative Reasoning • Engage in Argument from Evidence • Engage in Scientific Inquiry & Experimental Design • Analyze & Evaluate Data • Appreciate & Apply the Interdisciplinary Nature of Science
Business	• Business in Society • Globalization • Strategy • System Dynamics • Consumer Engagement • Transparency, Disclosure, & Metrics	• Select from and Deploy Diverse Thinking Skills (critical and analytical thinking, integrative thinking, systemic thinking, design thinking) • Exercise Ethical Judgment • Demonstrate Informational & Technological Literacy • Management, Teaming, and Cross-cultural Competence

Table 1.2 (*Continued*)

Discipline	Essential Concepts	Essential Competencies
Communication	• Social Construction • Relationality • Strategy • Symbolism • Adaptability	• Engage in Communication Inquiry • Create Messages Appropriate to the Audience, Purpose, & Context • Critically Analyze Messages • Demonstrate Self-efficacy • Apply Ethical Communication Principles & Practices • Utilize Communication to Embrace Difference • Influence Public Discourse
Economics	• Individual Decision Making • Markets & Other Interactions • The Aggregate Economy • Role of Government & Other Institutions	• Apply the Scientific Process to Economic Phenomena • Analyze & Evaluate Behavior & Outcomes Using Economic Concepts & Models • Use Quantitative Approaches in Economics • Think Critically About Economic Methods & Their Application • Communicate Economic Ideas in Diverse Collaborations

Discipline	Essential Concepts	Essential Competencies
History	• History as an Interpretive Account • The Relationship of Past & Present • Historical Evidence • Complex Causality • Significance	• Evaluate Historical Accounts • Interpret Primary Sources • Apply Chronological Reasoning • Contextualize • Construct Acceptable Historical Accounts
Sociology	• The Sociological Eye • Social Structure • Socialization • Stratification • Social Change & Social Reproduction	• Apply Sociological Theories to Understand Social Phenomena • Critically Evaluate Explanations of Human Behavior & Social Phenomena • Apply Scientific Principles to Understand the Social World • Evaluate the Quality of Social Scientific Methods & Data • Rigorously Analyze Social Scientific Data • Use Sociological Knowledge to Inform Policy Debates & Promote Public Understanding

Moreover, the competencies developed across the MCL disciplines align with many other dimensions of LEAP and the DQP. For example, both of these national frameworks note the importance of developing intellectual skills, which include categories

such as inquiry and analysis as well as critical thinking. All the MCL faculty panels placed a strong emphasis on those skills. The modes of thinking are defined in disciplinary ways (whether scientific inquiry in biology or analyzing and interpreting documents in history) but embody broader conceptualizations. Indeed, one could consider many of the competencies identified by the MCL panels as discipline-specific representations of the more generic competencies identified in LEAP and the DQP.

Finally, the purposeful design of the MCL project, with the intention of identifying both concepts and competencies and considering how they are related, aligns with LEAP and the DQP's emphasis on integrated thinking. The business faculty panel has gone the furthest in clearly and convincingly articulating the importance of integrated thinking. But faculty in all of the MCL disciplines have emphasized the importance of teaching students how to integrate and apply knowledge, whether it means integrating what one has learned across different courses and subdisciplines or applying theoretical knowledge to substantive concerns.

These insights from the MCL project are also highly relevant for designing assessments of student learning. To think of generic skills as simply generic can be limiting. If it is true that skills developed in a particular context do not easily transfer to other contexts, then it follows that a poor result on a generic skills assessment could indicate one of two things: a lack of a particular set of higher order skills or a lack of transfer. Not being able to distinguish between these two factors limits educators' ability to interpret assessment results and act on them in productive ways. Therefore, developing assessments that can measure higher order complex thinking skills in a range of disciplinary contexts, along with those abstracted from those contexts, is crucial. Doing so will allow scholars to examine the validity of the arguments regarding skills transfer and to provide valuable guidance for instruction.

In addition to the challenge of thinking about the distinction (or lack thereof) between generic and discipline-specific skills, we

encountered another challenge that we did not anticipate at the start of the project. We began with the idea that each discipline would define learning outcomes for both the major and the introductory course. This was in part done for methodological reasons: so that learning gains could be measured from the beginning to the end of an introductory course and from the beginning to the end of the major. We also wanted to improve our understanding of the relationship between the introduction to the discipline and the study of the discipline in the major. We were curious about the extent to which those learning outcomes would be similar or different. In other words, we wanted to know the extent to which the introductory course was a microcosm of the discipline as a whole.

We learned quickly that defining learning outcomes for the introductory course is quite challenging in many disciplines. In some disciplines, such as history, a single, stand-alone introductory course typically does not exist; students interested in exploring the discipline or potentially majoring in it are able to choose from an array of different courses. In other disciplines, such as communication, one of the most common introductory courses—public speaking—provides students with important skills but sometimes offers an incomplete picture of the discipline as a whole. Even in the disciplines that have a designated introductory course, such as sociology, the course is not always required before students can take other courses in the discipline. Economics and biology stand out in that the majority of departments have course sequences that must be taken at the beginning of the major and that clearly define the fundamental knowledge on which much of the subsequent learning builds.

This variation in introductory courses reflects in part the differential structures of the disciplines and their relationships to general education. However, it also reflects in part a lack of intentionality in curriculum design in higher education. Although curriculum maps and backwards design techniques have gained some traction recently, relatively few departments articulate explicitly how courses

fit together into a coherent whole (Wiggins and McTighe 1998). Accreditation agencies have begun to require that institutions define and measure learning outcomes, but this push has rarely translated into a serious evaluation of the curriculum or an alignment of courses with stated goals.

When there is a lack of intentionality around curriculum design and course sequencing, it can be quite difficult for faculty to foster the gradual, intentional development of students' knowledge and competencies. Indeed, in many disciplines and departments across the country, instructors in certain courses, especially upper-division electives, are unable to assume that students entering the course have any specific knowledge or skills. Often unrestricted by prerequisite requirements, these courses are likely to include students with extensive knowledge and skills and also those who are taking their first course in the discipline. At the department level, clearly defining a set of shared learning outcomes for the introductory course and the major can serve as a useful starting point for conversations about curriculum structure and the extent to which different courses can be sequenced and organized to scaffold student learning.

The final crucial lesson learned from the MCL project is the dire need for better assessments of learning outcomes in higher education. Faculty from across the higher education landscape are explicitly moving away from surface content knowledge and are instead emphasizing the importance of being able to perform more complex tasks: from analyzing and evaluating information to applying knowledge to new circumstances and even to creating knowledge by asking questions and following disciplinary practices to answer them. These kinds of learning outcomes require new types of assessments that go beyond measuring surface-level content knowledge via multiple-choice questions. Some organizations, such as AAC&U and NILOA, have started to develop and disseminate signature assignment templates and grading rubrics that can help faculty measure these types of meaningful outcomes

at the student, classroom, and department level. AAC&U is also exploring the feasibility of using signature assignments and rubrics as a way of generating valid and reliable data at the institutional and cross-institutional levels.

In addition to these signature assignments and rubrics, we believe that there is a need to update, improve on, and in some cases fundamentally transform discipline-specific standardized assessments. Many existing standardized tools, because they were developed decades ago, are misaligned with contemporary priorities for student learning, not to mention being out of step with modern assessment technology. Still, some departments use these tools to gather data on student learning for the purposes of self-improvement or accreditation, or to comply with institutional or state-level assessment requirements. However, many faculty, including those who use existing tools, are frustrated by them because they fail to generate useful information about the extent to which students are developing the kinds of deep conceptual understandings and competencies that they, their students, and other key stakeholders value. Since most of these tools were developed, the technology of assessment has advanced in such a way that it is now possible to design standardized (i.e., psychometrically valid and reliable) instruments that measure the kinds of complex understandings and skills that are critical to success in the 21st century. If developed, these tools would be a valuable resource for faculty and departments with an interest in evidence-based instructional improvement.

The data generated by these new-and-improved standardized tools would be distinct from and complementary to the data generated by signature assignment assessment tools like the VALUE rubrics in a number of ways. Perhaps most importantly, standardized assessment tools could gather data on a larger number of discrete learning outcomes than a typical signature assignment, thus providing a broader and in some ways finer-grained sense of what students know and are able to do. Generally speaking, they would also be less time-

consuming to administer and score than other assessment strategies. Furthermore, if departments were interested in comparing their students' performance with that of students at other institutions, these new standardized tools would offer a valid and reliable means for making such comparisons. Finally, because they would be developed for broad use, rather than a specific course or department, it would be possible for the developers of the assessments to invest the necessary resources toward constructing the highest quality questions and incorporating the latest advances in assessment technology. An economics assessment, for instance, could include an open-ended data analysis simulation that allowed the test taker to analyze and interpret real data. To give another example, a history assessment could feature a digital archive of documents that the test taker was prompted to sift through and interpret. Advances in assessment technology, such as adaptive testing technology, can also facilitate premeasurement–postmeasurement efforts. Standardized instruments should never be seen as the "end all, be all" of assessment tools, but if they are appropriately designed and deployed, they can play an important role in helping to improve student learning outcomes in higher education.

Volume Overview

The remainder of this volume consists of six MCL white papers and a series of commentary essays from higher education thought leaders. Each paper is the product of more than two years of in-depth discussion with disciplinary colleagues and extensive engagement with prior efforts in the discipline. The papers were written and revised several times over the course of two years as the authors aimed to synthesize panel discussions and to respond to specific feedback from their colleagues. Wherever possible, the white papers represent the consensus viewpoint of the panels. It should be noted, however, that there was not always uniform agreement within each

panel and that the ideas presented in these pieces should be seen as inherently subject to ongoing change and development.

Each of the discipline-specific white papers follows a similar structure. They begin with a comprehensive overview of prior efforts to articulate learning outcomes in the discipline. Building on these efforts and the MCL panels' insights, each paper articulates a 21st-century framework for undergraduate-level learning in the discipline, also known as a framework of essential concepts and competencies. Finally, the papers take stock of existing learning outcomes assessments and present a forward-thinking, discipline-specific vision for the future of assessment. They address common concerns head-on and offer compelling reasons for why faculty should find productive ways to engage with assessment not only in their own classrooms but also in their departments and beyond.

This volume includes white papers from the following disciplines (and authors): history (Lendol Calder and Tracy Steffes); economics (Sam Allgood and Amanda Bayer); sociology (Susan Ferguson and William Carbonaro); communication (Nancy Kidd, Trevor Parry-Giles, Steven Beebe, and W. Bradford Mello); biology (Clarissa Dirks and Jenny Knight); and business (Jeffrey Nesteruk and Sara Beckman). In lieu of a traditional concluding chapter, the book closes with a series of short reflective essays on the MCL project by thought leaders in the field of teaching, learning, and assessment in higher education: Peter Ewell (National Center for Higher Education Management Systems); Natasha Jankowski and George Kuh (NILOA); Carol Geary Schneider (AAC&U); and Charles Blaich and Kathleen Wise (Center of Inquiry at Wabash College).

The Future of Higher Education Assessment

As the pressures for accountability and the need for improved learning outcomes assessment in higher education have continued

to mount, the MCL project has engaged faculty and their disciplinary associations in an effort to generate proactive responses, and in so doing it has revealed an acute absence of appropriate discipline-specific assessment tools. Some disciplines have very little available in terms of standardized and validated assessments and often rely on homegrown, ever-changing assessments developed by individual departments for accreditation purposes. In other disciplines, available assessments are not appropriate for measuring complex thinking, higher order skills, or habits of mind. Even if colleges and universities were eager to embrace assessment, they would face a dearth of available tools.

This issue was brought to the fore recently by the events at Purdue University. Mitch Daniels, the recently appointed university president, embraced the need for assessment of student learning outcomes and asked the faculty to formulate a plan for how they could assess critical thinking and other skills that students develop during college. After two years, the faculty had not come up with a plan and asked for more time, leading to a clash with Daniels (Flaherty 2015). Although this situation has many complexities and some faculty may have been resistant to assessment, it is important to note that faculty had very little to work with, especially when it comes to assessing the domain-specific concepts and competencies that are at the core of their work as educators and experts in particular fields.

Even in less contentious situations, institutions that voluntarily join forces to examine student outcomes face an absence of domain-specific tools. In the Voluntary Institutional Metrics Project, a collective endeavor of eighteen colleges and universities supported by the Bill and Melinda Gates Foundation, the institutions aimed to develop a holistic framework for assessing college performance across five different dimensions, including student learning. However, the endeavor faltered on how to measure student learning, finding a lack of tools to assess domain-specific learning outcomes. The initial report from the project concluded that "there is

a clear need for a focused effort to overcome the lack of comparative assessments of learning outcomes at the program (major/discipline) level. When joined with existing assessments of learning at the core skills level, such assessments would provide a basis for the use of learning outcomes to inform policy decision-making" (HCM Strategists 2013, 22).

Faculty involved in the MCL project have demonstrated that it is possible to reach a general consensus about priorities for student learning in specific disciplines. This effort and the accompanying white papers provide keen insights into essential student learning outcomes in each discipline. As such, departments can use the white papers to review curricula, align courses with disciplinary learning outcomes, and intentionally develop course sequences that can gradually and effectively build students' disciplinary understandings and competencies. The concepts and competencies proposed by the MCL project are neither fixed nor all-encompassing. As departments use the MCL learning outcomes frameworks in their own reflections about curriculum and student learning, they will inevitably need to supplement and refine these frameworks in a way that aligns with their unique program goals and institutional missions. The process of developing learning outcomes and assessments is always an iterative one; the MCL project offers one such iteration and anticipates more in the future.

The MCL project to date has focused a great deal of attention on the articulation of essential concepts and competencies for undergraduate-level learning in six disciplines. One of the next steps for the project is to foster the development of appropriate assessment tools that can capture these essential concepts and competencies in a way that aligns with each discipline's unique priorities. These 21st-century assessments cannot be reductionist instruments that simply identify students' recollection of course material. Instead, they need to measure complex skills and disciplinary habits of mind. This requires more complex and more innovate item types and assessment structures than have been common to date.

Each white paper offers specific insights about key principles for developing assessments as well as a range of possibilities for various forms of assessments that would align with those principles.

As much as faculty engagement has been crucial at this first phase of the process—in defining concepts and competencies—faculty need to engage a broader set of stakeholders in their efforts going forward. If assessments are built and pilot tested, faculty will need to be prominent in the conversations throughout the process of tool development, piloting, and interpretation of the pilot data, but so too will other voices, such as students and representatives from the employer community (e.g., leaders from the private, public, and nonprofit sectors). Notwithstanding the importance of broader engagement with stakeholders, we believe that faculty, as educators, should continue to assume the primary responsibility for driving and leading efforts in this area. Disciplinary associations can provide a powerful vehicle for this continuous form of faculty engagement. This will require bold leadership, from mobilizing faculty across institutions to engage collectively in this endeavor to working through the complexities of instrument design. The inherent appeal of easy administration, easy grading, and high reliability of multiple-choice assessments (and resulting lower cost) can be hard to resist. Developing more complex assessments will require substantial investments of time and financial resources. Disciplinary associations will need to stay firm in protecting and advancing their faculty members' vision for assessments that can capture complex 21st-century skills.

Higher education is at a crossroads. Policy and public pressure to demonstrate value shows no signs of abating. The choice is either to continue to resist those efforts and critique inappropriate outcomes and measures or to engage with the challenges and provide an alternative answer, one that refocuses the conversation on student learning. In this introduction, and throughout the discipline-specific white papers in this volume, we make the case for the latter. Higher education first and foremost *educates*. Educating

students is the purview of the faculty, which places them at the center of conversations about what students ought to learn and how that learning should be assessed. It is thus imperative that faculty and their disciplinary associations make their voices heard. It has been our goal in this work to change the conversation and to offer pragmatic paths forward for improving student learning outcomes in higher education.

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