



# Intentional and Integrated Learning in a New Cognitive Age: A Signature Pedagogy for Undergraduate Education in the Twenty-First Century

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**F**rom its very start, the land-grant approach to higher education focused on intentional and integrated learning in ways that distinguished itself from previous models of higher education.

Students needed different skills to solve the real problems facing real people in real communities. And they needed those skills quickly. They needed practical knowledge accompanied by hands-on training. The land-grant university was built around those needs, with a new curriculum and a new pedagogy that were intentionally coordinated to integrate knowing with doing, in ways that mattered to those typically disenfranchised from higher education.

In many significant ways, the core mission and values of the land-grant university persist into the twenty-first century. Land-grant universities remain committed to providing higher education to advance the public good. Like Michigan State University (MSU), they work hard to maintain their commitment to be open to the poorest, and good enough for the proudest. Perhaps most importantly, they remain committed to responding to society's needs in ways that keep them relevant and engaged.

### GLOBALIZATION—AND ITS EVEN LARGER CONTEXTS

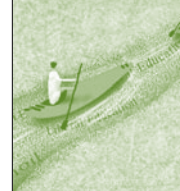
As Michigan State University moved into the twenty-first century, it became clear that the university remained committed to its original core values while stretching and shifting in ways that upheld those original values. The “state” university with eighty-three county offices now had more active international partnerships than local. The student population represented more countries than Michigan counties. Agricultural sciences were still concerned with crops, but making a rapid shift to research on plants as fuel and plastics,

rather than food. Departments, colleges, and other higher education institutions once seen as “competitors” were now “collaborators.” Undergraduate students, the traditional recipients of information, were increasingly expected to become generators of knowledge. Fundamental assumptions about what constituted a classroom, an academic semester, and definitions of scholarship were being challenged. The contours of the institution that claimed leadership in defining higher education in the nineteenth century were changing as fast as the science and technology on its campus.

While globalization is central to redefining higher education for the twenty-first century, it singularly fails to fully account for the *many* significant factors that have worked together to transform the university into the twenty-first century. *New York Times* columnist David Brooks wrote recently about rethinking the globalization paradigm, placing it in the even larger context of a *skills revolution* in a more demanding cognitive age (2008). Taken together, the two paradigms help more fully explain the significant transformative processes affecting the future of higher education.

### A SIGNATURE PEDAGOGY FOR A NEW COGNITIVE AGE: INTENTIONAL, INTEGRATED, EMBEDDED

The term “signature pedagogy” was of course coined by Lee Schulman, president emeritus of the Carnegie Foundation for the Advancement of Teaching. Schulman noted how distinctive teaching and learning practices in specialized professions such as medicine and law uniquely defined the student learning experience within those professional areas. Might there be signature pedagogy—distinctive teaching and learning practices—that differentiates a twenty-



first-century approach to undergraduate education in this more demanding cognitive age?

At Michigan State University, we began to answer that question by identifying noteworthy educational activities that combined our land-grant ethos with connected and purposeful learning, within a global context. As we examined our own best practices, we discovered examples of educational practices and programs that we believed constituted a newly emerging signature pedagogy for undergraduate education.

This new signature pedagogy can be characterized as *discovery-centered, interdisciplinary, integrative, translational, and contextual*. Although any one of these characteristics can contribute to an important and meaningful learning experience, it is the five together, interconnected in a program or experience, that results in the kind of twenty-first-century learning we are striving to achieve and assess.

*Discovery-centered learning* encourages students to produce original work that contributes to the knowledge or activity of a particular discipline or disciplines. It is research in the broadest sense—the finding out of something new that expands a working body of knowledge. Central to discovery-centered learning is the development of a faculty–student mentoring relationship. The processes associated with discovery-centered learning remain fundamental cornerstones in helping students become lifelong learners in their disciplines or professions. (See [www.venture.msu.edu](http://www.venture.msu.edu).)

*Interdisciplinary learning* is characterized by approaching a single topic or issue from a diverse range of disciplines. MSU President Lou Anna K. Simon noted in her February 2007 State of the University Address, “there is no problem or issue, domestic or global, which does not require an interdisciplinary definition and an interdisciplinary solution.

We will cut across boundaries—disciplinary, geographic, and political—to tackle the real problems society faces.” Problem-centered or issue-centered learning across the curriculum naturally employs interdisciplinary learning.

*Integrative learning* asks students to connect skills and knowledge from multiple sources and experiences, apply theory to practice in various settings, utilize diverse and even contradictory points of view, and understand issues and positions contextually. In doing so, it fundamentally connects knowledge to experience. MSU’s approach to general education – the Integrative Studies program – takes seriously the challenge of helping students develop the skills and abilities that promote integrative thinking and ‘ways of knowing’ across disciplines.

*Translational learning* prepares students to take what they learn in the classroom or lab and then apply it in a diverse range of real-world and real-work settings. Students are encouraged to apply new research or basic technology to a specific application or discipline and to then innovate beyond the original iteration or execution of an applied skill, by using it in new ways. Assignments and projects that prompt students to apply their cumulative learning experiences promote the application of translational skills.

*Contextual learning* is defined not just by location, but also by the consideration of the translation of knowledge within a specific environment. It requires students to not just know *how* to perform or respond outside the classroom, but to also consider the natural, social, and human-built factors of an environment to determine whether a new performance, in a new place, is appropriate, ethical, moral, and responsible.

### **SIGNATURE PEDAGOGY IN ACTION**

Not surprisingly, when we looked across our campus, examples of this newly emerging signature pedagogy typically crossed departmental, college, and disciplinary

boundaries. For example, the MSU Science, Technology, Environment, and Public Policy Specialization (STEPPS) program is a cross-collegiate program in public policy that relates to science, technological change, and environmental science. Instead of a singular disciplinary emphasis, the program emphasizes promoting change through the formulation of effective public policy.

Another “discovered” example of this new signature pedagogy in action was the MSU solar oven project. For this, engineering students carried out a project in Tanzanian villages that provided an alternative to the burning of wood and charcoal cooking fuels, thus addressing problems of deforestation and health. While effective, it required the native women in the villages to adopt a set of nontraditional behaviors. The solar oven project called on integrated knowledge from a variety of disciplines—from sociology to environmental science—well beyond the technology required to build the solar-powered cooking machine. At its foundation, this was a “discovery centered project,” but it also employed interdisciplinary and integrated knowledge, translated in ways that made it useful, in a specific cultural and geographic context. While our typical assessment strategies limit how we describe the outcomes of the experience, student participants have personally described it as “transformational” for them.

A newly emerging MSU program, the Information and Communication Technology (ICT) Global Corps, also embodies this new signature pedagogy for undergraduate education. This unique program combines global outreach and research. It engages teams of students in a study abroad program while they complete community-based ICT projects in developing regions of the world.

These are emerging examples of educational initiatives that demonstrate the signature pedagogy that we believe will help define undergraduate education in the twenty-first century. In its most basic



sense, it represents a natural evolution of the land-grant approach to higher education. It remains embedded in the values of the land-grant institution—quality, inclusion, and connectivity—now in a global context. The result is an approach to teaching and learning characterized by creativity, collaboration, and personal responsibility.

### LEARNING TO LEARN IN A NEW COGNITIVE AGE

The challenges facing our era will require not simply *more* education, but a different *approach* to education. College graduates are expected not only to know more than they did a generation ago, but to know *differently*.

The ability to know differently requires a different approach to learning, through educational experiences that are more intentional, reflective, and connected, experiences that result in the capacity of learners to make informed judgments. Promoting this kind of learning was at the heart of Integrative Learning: An Opportunity to Connect, a collaborative project of the Association of American Colleges and Universities and the Carnegie Foundation for the Advancement of Teaching. Michigan State University participated in the project, working on ways to “go global” with its integrative studies program through study abroad experiences. Our integrative studies program now reflects MSU’s approach to general education, providing courses that are integrative across disciplines, while emphasizing the skills that encourage students to integrate knowledge. We have a limited number of courses organized by one of our three centers – Integrative Arts and Humanities, Integrative Social Sciences, or Integrative Physical and Biological Sciences – each of which was carefully developed to advance the skills of integrative learning in the context of integrated subject matter.

Integrative studies represents one approach to helping students connect knowledge across boundaries. But in a

new global and “cognitive age,” universities need to be thinking broadly about both the ways in which they teach and the ways in which students learn. In the same way the land-grant university was an innovator for teaching and learning in the middle of the nineteenth century, it can again lead the way at the start of the twenty-first century. In the same way that the land-grant ethos spread and came to define an innovative approach to undergraduate education for colleges and universities that were not land grant, this newly emerging signature pedagogy has relevance to all of higher education.

### A SIGNATURE PEDAGOGY FOR WORLD-GRANT: REDEFINING UNDERGRADUATE EDUCATION AT A LAND-GRANT UNIVERSITY

One key component of this newly emerging signature pedagogy for undergraduate education at Michigan State University involves integrating it into our strategic positioning process, Boldness by Design. Central to this process is a commitment to transform the university from land grant to world grant. This concept of world grant was introduced by MSU President Lou Anna K. Simon, when she launched Boldness by Design. In 2005, on the one hundred and fiftieth anniversary of MSU’s founding, President Simon called for the university’s re-creation. There were seven years between the agricultural college’s founding (1855) and the 1862 Morrill Land Grant Act, for which MSU served as a model. Now, Michigan State University is aspiring to transform itself into a “world-grant” institution by 2012.

At its most basic level, world grant represents a natural evolution of the land-grant mission and ethos. Like land grant, world grant involves being responsive and responsible to society, but now in a global context. More practice than theory, more direction than definition, world grant signals a fundamental culture change within higher education, a culture change that focuses on

the way we work as much as the work we do. World grant sets itself apart from a previous era and approach to education in much the same way that land grant did, more than 150 years ago. For undergraduate education at Michigan State University, this culture change is embodied in what we’ve come to call our World-Grant Signature Pedagogy.

### WORLD-GRANT SIGNATURE PEDAGOGY: BEING CHANGE

Michigan State University continues to educate students in ways that promote their abilities to discover, problem solve, and make ethical judgments. Like other research universities, we are working on global issues; at MSU those include sustainability, economic development, energy, food and food security, technology, and health. In a land-grant institution, there is always the added commitment to make this knowledge accessible to real people in real communities. In the world-grant institution, the key is to resist defining these commitments as separate enterprises and to deliberately work toward integration, where one role supports and informs the other. The Signature Pedagogy of the World-Grant Institution connects the undergraduate student to that integrated mission, not as a passive learner, but as a working apprentice in advancing knowledge and transforming lives.

Accompanying the urgent calls for accountability, efficiency, and evidence-based outcomes in higher education is an equally urgent call for higher education to fundamentally change the way it prepares students to face the challenges of the future. A single, isolated, and short-lived program in one part of a university is clearly not the answer. An integrated, embedded, and long-term culture change within higher education is clearly required. The newly emerging signature pedagogy for undergraduate education represents that kind of change. ■

### REFERENCE

Brooks, D. “The Cognitive Age” [www.nytimes.com/2008/05/02/opinion/02brooks.html](http://www.nytimes.com/2008/05/02/opinion/02brooks.html)

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