Examples – Technology and Societal Concerns in Undergraduate General Education
January/February 2018

Example 1 - Mellon College of Science, Carnegie Mellon University[1]

Carnegie Mellon University has college-specific general education student learning outcomes. Two of their fifteen learning outcomes for the Mellon College of Science are similar to Clemson's STS area:

- Identify global examples of the reciprocal relationships among science, technology, political forces, societal contexts, and environmental issues.
- Articulate how one's own developing skills in science and technology can be increasingly used in constructive community service or engagement that recognizes the potential impact on local and global issues, including environmental impact and sustainability.

Example 2 – Miami Dade College[2]

Miami Dade has 10 learning outcomes total, including the following.

Outcome: Describe how natural systems function and recognize the impact of humans on the environment.
Rubric for assessment:

MDC Learning Outcome	Emerging 1	Developing 2	Exemplary 3	Proficient 4
LO 10 Natural Systems and the Environment (Revised 1/26/09)	Response does not illustrate any understanding of natural system functions and / or human impact on the environment. Based on data provided, misinterprets or fails to recognize the impact of individuals or societies on the environment.	Using limited details, response illustrates limited understanding of natural system functions or human impact on the environment. Based on data provided, recognizes the impact of individuals and societies on the environment but cannot formulate strategies to minimize this impact.	Using adequate details, response illustrates an understanding of natural systems functions and human impact on the environment. Based on data provided, recognizes the impact of individuals and societies on the environment and formulates strategies to minimize this impact.	Using accurate and appropriate details, response illustrates a thorough understanding of natural systems functions and the effects of human impact on the environment. Based on data provided, recognizes the impact of individuals as members of a larger society and formulates an integrated approach to minimizing a society's impact on the environment.

[1] https://www.cmu.edu/mcs/undergrad/index.html
[2] https://www.mdc.edu/learningoutcomes/

Example 3 – Integrative Learning Rubric from AAC&U (Association of American Colleges & Universities)[3]

INTEGRATIVE LEARNING VALUE RUBRIC

for more information, please contact value@aacu.org

Definition

Integrative learning is an understanding and a disposition that a student builds across the curriculum and cocurriculum, from making simple connections among ideas and experiences to synthesizing and transferring learning to new, complex situations within and beyond the campus.

Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (cell one) level performance.

	Capstone 4	Milestones 3	Milestones 2	Benchmark 1
Connections to Experience *Connects relevant experience and academic knowledge*	Meaningfully **synthesizes** connections among experiences outside of the formal classroom (including life experiences and academic experiences such as internships and travel abroad) to **deepen understanding** of fields of study and to broaden own points of view.	Effectively **selects and develops** examples of life experiences, drawn from a variety of contexts (e.g., family life, artistic participation, civic involvement, work experience), to **illuminate** concepts/theories/frameworks of fields of study.	**Compares** life experiences and academic knowledge to infer differences, as well as similarities, and **acknowledge perspectives** other than own.	**Identifies** connections between life experiences and those academic texts and ideas **perceived as similar and related** to own interests.
Connections to Discipline *Sees (makes) connections across disciplines, perspectives*	Independently creates wholes out of multiple parts (synthesizes) or draws conclusions by combining examples, facts, or theories from more than one field of study or perspective.	Independently connects examples, facts, or theories from more than one field of study or perspective.	When prompted, connects examples, facts, or theories from more than one field of study or perspective.	When prompted, presents examples, facts, or theories from more than one field of study or perspective.
Transfer *Adapts and applies skills, abilities, theories, or methodologies gained in one situation to new situations*	Adapts and applies, independently, skills, abilities, theories, or methodologies gained in one situation to new situations **to solve difficult problems or explore complex issues in original ways.**	Adapts and applies skills, abilities, theories, or methodologies gained in one situation to new situations **to solve problems or explore issues.**	Uses skills, abilities, theories, or methodologies gained in one situation in a new situation **to contribute to understanding of problems or issues.**	Uses, in a basic way, skills, abilities, theories, or methodologies gained in one situation **in a new situation.**
Integrated Communication	Fulfills the assignment(s) by choosing a format, language, or graph (or other visual representation) **in ways that enhance meaning**, making clear the interdependence of language and meaning, thought, and expression.	Fulfills the assignment(s) by choosing a format, language, or graph (or other visual representation) **to explicitly connect content and form**, demonstrating awareness of purpose and audience.	Fulfills the assignment(s) by choosing a format, language, or graph (or other visual representation) that **connects in a basic way** what is being communicated (content) with how it is said (form).	Fulfills the assignment(s) (i.e. to produce an essay, a poster, a video, a PowerPoint presentation, etc.) **in an appropriate form.**
Reflection and Self-Assessment *Demonstrates a developing sense of self as a learner, building on prior experiences to respond to new and challenging contexts (may be evident in self-assessment, reflective, or creative work)*	Envisions a future self (and possibly makes plans that build on past experiences) that have occurred across multiple and diverse contexts.	Evaluates changes in own learning over time, recognizing complex contextual factors (e.g., works with ambiguity and risk, deals with frustration, considers ethical frameworks).	Articulates strengths and challenges (within specific performances or events) to increase effectiveness in different contexts (through increased self-awareness).	Describes own performances with general descriptors of success and failure.

[3] https://www.aacu.org/value/rubrics

Example 4 - Stony Brook University[4]

The Stony Brook Curriculum requires student learning on 4 areas: Demonstrate Versatility, Explore Interconnectedness, Pursue Deeper Understanding, and Prepare for Life-Long Learning. The Demonstrate Versatility category requires a course in Understanding Technology:

Learning Outcomes for Understand Technology

1. Demonstrate an ability to apply technical tools and knowledge to practical systems and problem solving.
2. Design, understand, build, or analyze selected aspects of the human-made world. The "human-made world" is defined for this purpose as "artifacts of our surroundings that are conceived, designed, and/or constructed using technological tools and methods."

Examples 5 & 6 - University of Maryland[5] and Indiana University East[6]

The natural sciences courses at the University of Maryland and the "scientific ways of knowing" courses at Indiana University East include multiple course-level student learning outcomes. Among those, two from each are similar to Clemson's STS competency:

From UMd	From IUE
Look at complex questions and identify the science and how it impacts and is impacted by political, social, economic, or ethical dimensions.	Distinguish between scientific and nonscientific evidence and explanations.
Critically evaluate scientific arguments and understand the limits of scientific knowledge.	Apply foundational knowledge and discipline-specific concepts to address issues or solve problems.
	Locate reliable sources of scientific evidence to construct arguments related to real-world issues.

[4] http://sb.cc.stonybrook.edu/bulletin/current/policiesandregulations/degree_requirements/stonybrookcurriculum.php

[5] University of Maryland. http://www.gened.umd.edu/documents/TransformingGeneralEducation.pdf; rubrics are here: http://www.gened.umd.edu/for-faculty/faculty-gened-assessment.html

[6] Indiana University East. http://www.iue.edu/catalog/policies/documents/IU_East_General_Education_Curriculum_2017.pdf

Example 7 – Revising Student Learning Outcomes[7]

"The 1997 Campus Learning Objectives were written by faculty, for faculty. The two examples below illustrate high aspirational goals with no clear path for attaining them within the university:

1. Educated persons should develop the skills to understand, accept, and relate to people of different backgrounds and beliefs. In a pluralistic world one should not be provincial or ignorant of other cultures; one's life is experienced within the context of other races, religions, languages, nationalities, and value systems.
2. Educated persons should be expected to have some understanding of and experience in thinking about moral and ethical problems. A significant quality in educated persons is the ability to question and clarify personal and cultural values and thus be able to make discriminating moral and ethical choices.

The new Campus Learning Outcomes are written purposefully in a clear and concise language, which helps students understand expectations of them:

1. Communicate clearly and effectively in written and oral forms
2. Access, use, and critically evaluate a variety of relevant information sources
3. Apply principles of inquiry to define and analyze complex problems through reasoning and discovery
4. Demonstrate the ability to relate within a multicultural and digitally connected world
5. Demonstrate a deep understanding of a field of study

Each new outcome comes with an explanatory paragraph to provide clarity, which helps faculty members, students, and stakeholders better understand the intent of each outcome. It is clear that the new outcomes are simpler, streamlined, and easier to assess compared with the old objectives."

[7] Excerpts from Alexander, R., Blakefield, M., Frank, K., & Pomper, M. (2016). State Mandates and General Education: One Campus Responds to Challenges and Opportunities. *The Journal of General Education*, 65(1), 36–47.