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Quantitative Literacy and the Humanities

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Quantitative Literacy (QL) and the humanities are mutually supportive, but many humanities faculty are unsure of how to integrate QL into their courses. My innovative web-based resource, "Quantitative Literacy and the Humanities," provides faculty with student learning outcomes, a primer of quantitative skills, and a transferable model syllabus so that their students can become more quantitatively literate and, therefore, more effective humanists too.

Outcomes:

- Define quantitative literacy
- Articulate interconnections between QL and the humanities
- Identify resources for teaching and learning QL

Category: Innovation

Describe the planned innovation addressed in your paper and what motivates it.

Describe what you see in your students', colleagues', or institution's behavior that you want to change. Describe the learning objectives you want students or colleagues to better achieve as a result of your innovation.

Quantitative Literacy is one of the Association of American Colleges and Universities' Essential Learning Outcomes, one that cannot be achieved in math and science courses alone (AAC&U, 2010). It is the rigorous and sophisticated application of relatively elementary mathematics to new situations. Much like writing, QL encompasses a wide-ranging set of skills and cuts across the undergraduate curriculum (Steen, 2004). Just as good writing skills support the sciences and mathematics, good QL skills support the humanities (Miller, 2010). We unlock new possibilities and tools for precision when we incorporate mathematical thinking into our disciplines. At the same time, robust QL is not possible without the values, nuance, and range of experience encountered in the humanities. QL cannot eliminate uncertainty; mathematics alone cannot stand in for good judgment. In this era of big data, humanistic QL is an urgent need (Steen, 1999).

Despite this need in our students, many humanities faculty are unsure of how to integrate QL into their courses. In response, I have developed an extensive web-based resource for

humanities faculty (Chrastil, 2014). It supports Xavier University's student learning outcome: "Students evaluate real-world problems using quantitative methods and arguments." More specifically, after this course, students will be able to...

Write about quantitative patterns

Estimate using arithmetic

Use evidence to make an argument

For each SLO, I elaborate on the quantitative and qualitative techniques needed. For example, in order to write about quantitative patterns, students will need to be able to write cogently about one number, attend to grammar and mathematical vocabulary, describe change over time, distinguish between absolute and relative change, etc. I give specific examples supported by scholarly and popular literature (Carnegie, n.d.; Gigerenzer, 2002; Miller, 2004; Paulos, 1996; Silver, 2012; Wheelan, 2013). I tie the SLOs and skills together in a model syllabus.

If your innovation involves a particular course, briefly describe the course, its students, and its place in the curriculum.

The course framework that I will share can be applied to any History course and is relevant to many humanities courses. The specific course I will refer to is called *Revolutions*. It is a 100-level History course that fulfills a requirement for all students. Any student may take the course—typically, such a course includes a mix of first-year and upper-class students, and majors from History to the sciences to business. It is capped at 25.

How is your innovation different from ones that others have tried?

My innovation is different because it integrates QL with the substantive discipline of History and it is a complete course rather than a stand-alone activity.

Leading innovators in quantitative literacy teaching and learning are developing curricula that are primarily mathematics-oriented—that is, they are not integrated with another discipline. For example, Carnegie Foundation's Quantway® pathway aims "to promote success in community college mathematics and to develop quantitatively literate citizens" (Carnegie Foundation, n.d.). Also, the Charles A. Dana Center at the University of Texas at Austin is unrolling its New Mathways Project, which includes a Quantitative Reasoning course (Dana Center, 2014). I referred to the SLOs and course outlines in these curricula to build my own course.

Although stand-alone classroom activities devoted to QL in a humanities course exist (MQED, n.d.; NNN, 2008), I have not identified a complete course that integrates a pedagogically

informed, well-scaffolded QL with humanistic study.

Assessment and baseline: Indicate how you plan to determine the success and effectiveness of your innovation. If outcomes are not yet available, indicate when they will be (by the time of the session?).

For the past two years, Xavier University has been assessing students' QL using a performance task. Although this assessment tool will be continually improved, the preliminary studies suggest that among students outside of the sciences, QL skills stagnate between the first year and graduation. I have personally taken part in the revision and assessment of this task, so I am familiar with the assessment rubric and the institutional goals and norms. My students will take the performance task upon starting the course to establish a baseline, and another task at the end of the course. This course will be offered for the first time in Fall 2014, so by the time of the conference I will not be able to provide outcomes, but I will be able to present the baseline for the students and report on their learning.

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Organization:

Participants will consider their own engagement with numbers and their challenges with students' quantitative literacy.

Participants will engage with definitions of quantitative literacy.

Participants will engage in discussion of an example activity, "What is the Middle Class?" to illustrate how quantitative literacy can be effectively integrated into a humanities course. The activity includes various texts, graphs, and images comparing nineteenth-century Europe to the 21st-century United States.

Participants will be able to study a handout based on the website and then engage in conversation about it. I will not present the website in excruciating detail, but rather present the highlights and invite conversation.

Keywords:

Humanities Pedagogy

Quantitative Literacy

Web

Writing