The Development of Humanities 102:
Using Quantitative Reasoning to Examine and Analyze the Mathematics and History Found in Pop Culture

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In an effort to update the college's program outcomes, the faculty of Clatsop Community College worked together throughout the 05/06 academic year to identify and develop a set of Intended Student Learning Outcomes (ISLOS) for each of the college's degree and certificate programs. Each program had a unique set of learning outcomes, and though the wording varied from one program to the next, all programs had at least one outcome addressing student's ability to reason and communicate mathematically.

After the ISLOS were developed, the next task the faculty faced was to determine how and where each of the program learning outcomes would be assessed. During discussions a comment was made that assessment of learning outcomes would be easier if there was a single class in which all ISLOS could be assessed at the same time. There was no such class currently in existence that, but perhaps a yearlong course sequence could be developed in which most, if not all, learning outcomes could be assessed. The result was the development of a three-term humanities sequence that would be piloted during the 06/07 academic year. Each term, between two to three different ISLOS would be assessed. Two instructors from different disciplines would teach each class. After completing the three-term sequence, students would receive instruction from six instructors representing six disciplines. The second humanities course, Humanities 102, would be developed specifically to assess student's ability to reason and communicate mathematically.

History and mathematics were the two subjects chosen to be integrated in Humanities 102. Three of the Intended Student Learning Outcomes (ISLOS) for the Associate of Arts Oregon Transfer degree would form the basis for the course outcomes. Learning experiences would be designed to assist the student in realizing the following ISLOS:

- Express ideas clearly and creatively in diverse ways through art, speech, writing, technologies, and mathematics.
- Use research skills to access information from multiple sources, use critical thinking skills to evaluate and synthesize information in the form of conclusions, ideas, and opinions.

- Recognize one's role in world community issues with a respect for diverse cultures and differing worldviews while embracing a sense of pride in one's own regional values and historical heritage.

It was anticipated that students of all levels of mathematical backgrounds and abilities would be enrolled in the course. As a humanities course there would be no math pre-requisites. Therefore, the course had to be developed so a student's ability to reason and communicate mathematically could be assessed regardless of their level of mathematical understanding. Therefore, the course would need to teach and assess student's quantitative reasoning skills. The original intent was to teach world history and the history of math side by side, essentially integrating the two timelines into one. The course would be designed and taught by Debbie Kaspar, the college's history instructor and myself, representing mathematics. Our hope was that students would find the course fun, interesting and motivating. We had many ideas for class activities. The difficulty would be how to teach quantitative reasoning and how to develop authentic assessment tools.

The American Mathematics Association of the Two-Year College (AMATYC) administers a National Science Foundation (NSF) funded project called Math Across the Curriculum (MAC^3). According to their website (www.mac3.amatyc.org) Their goal is to train math and non-math faculty across the disciplines to create, evaluate and modify projects that incorporate mathematics. Debbie and I felt this would be a perfect environment in which to further develop the humanities course. We wrote a proposal and were accepted into their four-day summer institute.

The first day of the institute Debbie and I developed class activities for the first two weeks class. We were confident we were well on our way to designing a good class, but still were not satisfied that we had satisfactorily incorporated quantitative reasoning into the course content. After presenting our course to our mentor at the institute, she agreed that the course did not contain an adequate quantitative reasoning component. Without that component, assessment of mathematical reasoning and communication could not be achieved. She suggested we think back to why the ISLOS that related to mathematics were written. Then to look again at what outcomes needed to be assessed, rewrite course objectives so they could be assessed, then create class activities and lesson plans with assessment as our ultimate goal. The entire course needed to be redesigned.

Students need to think and reason for themselves. They are exposed daily to statements in the media that they assume to be true for no other reason than they heard it on television, saw it in a movie, or read it on the Internet. Pop culture blurs the lines between what is true and what is not. Students need to be able to distinguish what seems to be true from what is actually true. Once they are able to determine the real math and real history they are exposed in the media, they can then begin to identify the patterns and sequencing, and analyze the cause and effect relationships which are inherent in both subjects. Quantitative reasoning can be used to address the questions or debate that naturally arise in pop culture from a global, national and/or local perspective.

Humanities 102 became a class in analyzing the math and history found in pop culture. Students would be exposed to some aspect of pop culture, a movie, television show, news report, magazine article, etc. They would be required to develop a list of questions from that media source. A class brainstorming session would follow in which students would share their questions and develop a list of questions or claims, which they could further investigate to determine its truth or relevancy. They would support their conclusions by collecting and analyzing data on their topic. Their findings would then be presented to the class. Quantitative reasoning became an integral component of the course design, making its assessment a natural process. The humanities course would include the following outcomes and assessments:

Intended Course Outcomes

- Impel students to be active learners.
- Make learning about mathematics and history an enjoyable experience.
- Enhance students' ability to analyze history and mathematic issues using quantitative reasoning.
- Students will communicate their reasoning using speech, writing and mathematics.
- Enable students to sort out the real math and real history from the myths found in pop culture.
- Increase students' ability to see the connections between mathematics and history.
- Prepare students to continue their study of mathematics and history.

Course Assessment

- Writing will be assessed using the English department's scoring guide.
- Presentations will be assessed using the Speech department's scoring guide.
- A Teamwork-scoring guide will be used to assess teamwork on projects.
- Historical accuracy will be assessed by History department's scoring guide.
- Math department's quantitative reasoning scoring guide will assess communication of mathematics.
- Students will complete a self-evaluation at the beginning and end of the course.

The class was taught during the winter term of 2007. Twenty-five students were enrolled in the class. In general, the course was successful. Anecdotal evidence exists to suggest that students were actively involved in their learning, most found it enjoyable and they saw connections between math and history. Students were observed using quantitative reasoning to analyze the mathematical and historical issues. Students communicated their reasoning using speech, writing and mathematics and did discover some myths in pop culture. However, there is room for improvement in the area of further defining and teaching quantitative reasoning. Expectations of communication skills were not emphasized. Pre and post testing regarding quantitative reasoning and students attitudes toward mathematics were given on the first and last day of class. Results are currently being compiled and summarized by MAC^3 and hopefully will be available prior to the ALM 14 conference in June.