

Ideas and Resources for Teaching to ILO #3: Quantitative Literacy

Assignment, Assessment and Activity Ideas to Support Students in Achieving ILO #3

- There is constant reflection and analysis of technical data and application. (AMT)
- Students apply knowledge learned through course materials to pre-existing assumptions they may have brought with them in relation to prehistory, the ancient world, and the manner in which data is mined from archaeological contexts. This requires recognition of culturally differentiated attitudes about the past and who should/does have access to material goods from the ancient world. (ANTH)
- Glaze chemistry project (ART)
- Application and analysis of electronic circuits and applications. (EET)
- “Documentation scavenger hunts.” A key function of an electro-mechanical technician is sorting through device documentation to find the information you need. I believe this supports ILO #3 regarding quantitative literacy. Rather than give the students every relevant number, parameter, and piece of information that they need, I would like them to be able to scan a datasheet/manual to locate and interpret that information, as this is a key that separates exceptional technicians from mediocre ones. (EET)
- Quantitative Literacy is advanced through the use of their food journals and the Cronometer app where they analyze their current nutrient intake and develop methods of finding nutrient balance through food. Students also use the Cronometer app to determine an adequate 1-day diet for a hypothetical person, as well as analyze their Cooking Video meal's nutritional density. (FN)
- There are tons of graphs in the book. We discuss these and compare data from past and present to make predictions about the future, regarding the societal trends covered in the course. Students also have to review and summarize research articles that include quantitative data. (HEC)
- Quantitative Literacy is advanced through the use of their food journals and the Cronometer app where they analyze their current nutrient intake and develop methods of finding nutrient balance through food. (HPE)
- Application and analysis based on the earlier assumption of need to create a product. At the core of what students in manufacturing do is finding applications and using quantitative analysis to solve the problem the application presents as they develop the solution in form of product. Not much adaption was necessary beyond making students more cognizant of the process and procedure. (MFG)
- Analysis of weld and design (MFG)
- Students were memorizing graphical depictions of component behavior rather than gleaning a deeper understanding of what the graph was conveying, so I re-wrote exam questions and held in-class discussions to help students develop their ability to analyze and understand the implications of data rather than simply commit data to memory (MFG)
- Through the application of written manufacturing process, applied mathematics, as well as introducing basic metallurgy/chemistry, this course aided in the students’ abilities in both quantitative literacy and critical thinking/problem solving. (MFG)

- Students are trained to be extremely analytical in their learning of welding so that they know the problems they encounter and the diagnostics required to adjust equipment and process for a more desirable outcome. This is done through a variety of learning styles, including journaling, analytical comparison via physical rubric and a Socratic method in pairs. (MFG)
- Written papers (MP)
- Students write a report on a town, city, wherever and calculate the growth curve. (MTH)
- Final exam (MTH)
- Because this is a math class, the students applied new quantitative literacy with every unit. Problem solving techniques. Explored and discussed how to approach problems. Addition subtraction, multiplication, and division methods. Explored and discussed a variety of algorithms to find solutions. (MTH)
- Students have a final project where they research a math topic of their choice and present this to the class. The topic choices allow for excellent discussions, which students lead. Students' application of the knowledge and analysis of ideas flows. Researching and learning about math rather than making assumptions is important Students learn the material and interact with the math. (MTH)
- Small assignments revolve around reading and critiquing articles that use data in some way, especially if it is used to draw conclusions. (MTH)
- Write their own problems and solve them. Then share the problems with a small group or the class. (MTH)
- Professional papers and concept maps (NRS)
- Theory, assignments, and clinical practice focus on the development of clinical judgment through assessment, interpretation, and response to patient care situations. (NRS)
- Theory exams (NRS)
- We spend a lot of time looking at journal articles and discussing assumptions we might make from the data, and as well how to analyze research data and apply it to ourselves or the general public. (PSY)
- Students are required to use peer-reviewed journal articles for their final research papers. They must look at the data for "application and analysis" related to their research topic. (PSY)
- I included in MTH 244 some discussion/review of quantitative and pseudo-quantitative measurement (topics discussed more thoroughly in MTH 243) as it relates to conclusions arising from statistical analyses. (STAT)
- Students used quantitative data as support for their thesis statement in the proposal essay (WR)
- We go over the use of visuals, such as graphs, and how they can be used to highlight or de-emphasize certain data. (WR)

Resources, Assignment, Assessment and Activity Ideas Specific to Dimensions

INSTRUCTION IDEAS

Assumptions:

- Instructors should talk more about assumptions in class.
 - After formative assessment, several group members mentioned their students' knowledge of assumption is limited to assuming the data used in the course is collected properly.

- Instructors should introduce critical information literacy by encouraging students to question sources of information
- Instructors should also be cognizant of what assumptions they are making when they generate assessments.
 - Talk to the students to determine how to develop culturally sensitive standardized test questions to ensure outcomes can be measured accurately.
 - For example, “How many times do you eat chocolate during Lent?” makes the assumption everyone knows what Lent means.
- Instructors should remind students that there are multiple ways to accomplish a task.
- Ask students whether they are aware of the assumptions they are making when viewing and interpreting data?
- Application/Analysis is fairly easy if taught, the hard part is teaching Assumptions. They are so trained to just find the answer they don't look at the parts of a problem/issue to make an assumption.
- I have been emphasizing the importance of assumptions more. They are used to their other classes where you must be aware of your own biases and any assumptions you have made so that you can try to eliminate or at least ignore them, because they are yours and probably get in the way of properly analysis. In math however it is the assumption that leads to the model (yes, in math we don't pick an equation for our model, we form assumptions and they lead to the model). It's a work in progress. (MTH)

Analysis:

- Even Middle School students can do Quantitative Literacy if taught and stepped through the process. (BUS)
- Academic analysis is more than just general information. Can be used to direct &/or detect a perspective. (WR)

ACTIVITIES

Assumption:

- The instructor provides students with a link to information about dihydrogen monoxide that includes true but misleading information about the dangers of water. Students who rely on the single source often jump to the conclusion that water should be banned. Later, they are asked to reflect on this assumption. (BI)
- Students are asked to select a town, gather population data, generate a growth curve, and then compare projected data to the actual population. They must use assumptions to explain the difference between the two. (MTH)
- Raise opposing views and arguments as part of the process before any final writing. (WR)

Analysis:

- Assumptions about following directions = different results (ART)
- Students must determine the material composition of a penny. While this takes about five minutes to Google, they have to show and analyze data to support the answer (BI)
- Basic equations may be a stumbling block for students if they don't really remember from last class or last math class. Assuming that they have the knowledge is not good. Pre lab quizzes help with this. (BI)
- Students are asked to analyze financial statements to determine how a company is performing (BUS)

- Students come in. Identify and teach them to use critical thinking. Give them the same quiz at the beginning and end of the term. See growth from their assumptions. Reading-facts. Reading and interpretation. Learning how to reason and change our assumptions through reading facts. (CG)
- Textbooks include tables, graphs, charts, etc. related to content and it provides opportunities to read and interpret the data. Ask students to make future predictions.(Consumer & Family Studies)
- Explaining industry-wide vocabulary for quantifying, measuring, and making conclusions with integrity. (CS)
- Students assume that speaking slowly in another language helps them to be understood, when actually they need to put the stress on certain parts of the word to be understood. (ESOL)
- Use article of summary, concept maps, overlaying multiple maps, and focus on evidence-based decision-making to support clients (Health Sciences)
- Teaching students that they don't know what the basic terms mean. They assume that they know. Difference between academic and social norms when discussing government terminology, etc. Students assume cause and effect correctly. Assess students' assumptions through class discussion and essays (HST)
- Social sciences can use analysis to compare trends and stats across history
 - i.e. analyzing how "Patriotic history" trends parallel those of WWII Germany (HST)
- Analyzing lab results to interpret rationale for patient care (MA)
- Different equations = different answers. Using different equations and how students assume and or know what equations to use.(MTH)
- Writing assignments: Students make a claim, use evidence to support the claim, and explain how/why it supports their claim. (Pre-College)
- Pre lab quizzes so faculty do not assume what students know. (NUR)
- Can be very difficult to help students to understand difference between article summary and article critique. Summary is easier, critique takes teaching and practice. (NUR)
- Showing research papers and how to find them, then how to find specific elements/parts of what it contains - what is it actually saying? What is the hypothesis? (SCI)
- Assumptions are too easy to make (we do it all the time without thought) - get the students to write more analysis- just think about it. (SCI)
- Sciences - Support students to locate and cite credible sources and websites (SCI)
- Very applicable for technical writing especially for identifying problems, locating credible sources, interpreting the data, and making conclusions. (WR)

RESOURCES

- *Freakonomics Radio* episode called "[America's Math Curriculum Doesn't Add Up](https://freakonomics.com/math/)" (Ep. 391) <https://freakonomics.com/math/> (Steve Levitt investigates whether traditional math instruction is really preparing students for the work of the digital era. What he found was a curriculum that is not teaching data literacy)