



Quantitative Literacy at WOU

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Presentation to Faculty Senate

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LEAP

- In November, Faculty Senate recommended that WOU adopt LEAP's (Liberal Education & America's Promise) learning outcomes.
- One of those learning outcomes is Quantitative Literacy

Quantitative Literacy

Quantitative Literacy (QL) is a 'habit of mind' competency, and comfort in working with numerical data. Individuals with strong QL skills possess the ability to reason and solve quantitative problems from a wide array of authentic contexts and everyday life situations. They understand and can create sophisticated arguments supported by quantitative evidence and they can clearly communicate those arguments in a variety of formats (using words, tables, graphs, mathematical equations, algorithms, etc., as appropriate). (AACU).

My Task

- This year I was tasked with developing a rubric that supports assessment of quantitative literacy in general education for both Bachelor of Arts and Bachelor of Science students at WOU.
- I sought to identify elements of quantitative literacy that are most important to faculty and the levels of competency that are expected in general education from BA and BS graduates.

	Capstone 4	Milestones		Benchmark 1
		3	2	
Interpretation <i>Ability to explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words)</i>	Provides accurate explanations of information presented in mathematical forms. Makes appropriate inferences based on that information. <i>For example, accurately explains the trend data shown in a graph and makes reasonable predictions regarding what the data suggest about future events.</i>	Provides accurate explanations of information presented in mathematical forms. <i>For instance, accurately explains the trend data shown in a graph.</i>	Provides somewhat accurate explanations of information presented in mathematical forms, but occasionally makes minor errors related to computations or units. <i>For instance, accurately explains trend data shown in a graph, but may miscalculate the slope of the trend line.</i>	Attempts to explain information presented in mathematical forms, but draws incorrect conclusions about what the information means. <i>For example, attempts to explain the trend data shown in a graph, but will frequently misinterpret the nature of that trend, perhaps by confusing positive and negative trends.</i>
Representation <i>Ability to convert relevant information into various mathematical forms (e.g., equations, graphs, diagrams, tables, words)</i>	Skillfully converts relevant information into an insightful mathematical portrayal in a way that contributes to a further or deeper understanding.	Competently converts relevant information into an appropriate and desired mathematical portrayal.	Completes conversion of information but resulting mathematical portrayal is only partially appropriate or accurate.	Completes conversion of information but resulting mathematical portrayal is inappropriate or inaccurate.
Calculation	Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem. Calculations are also presented elegantly (clearly, concisely, etc.)	Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem.	Calculations attempted are either unsuccessful or represent only a portion of the calculations required to comprehensively solve the problem.	Calculations are attempted but are both unsuccessful and are not comprehensive.
Application / Analysis <i>Ability to make judgments and draw appropriate conclusions based on the quantitative analysis of data, while recognizing the limits of this analysis</i>	Uses the quantitative analysis of data as the basis for deep and thoughtful judgments, drawing insightful, carefully qualified conclusions from this work.	Uses the quantitative analysis of data as the basis for competent judgments, drawing reasonable and appropriately qualified conclusions from this work.	Uses the quantitative analysis of data as the basis for workmanlike (without inspiration or nuance, ordinary) judgments, drawing plausible conclusions from this work.	Uses the quantitative analysis of data as the basis for tentative, basic judgments, although is hesitant or uncertain about drawing conclusions from this work.
Assumptions <i>Ability to make and evaluate important assumptions in estimation, modeling, and data analysis</i>	Explicitly describes assumptions and provides compelling rationale for why each assumption is appropriate. Shows awareness that confidence in final conclusions is limited by the accuracy of the assumptions.	Explicitly describes assumptions and provides compelling rationale for why assumptions are appropriate.	Explicitly describes assumptions.	Attempts to describe assumptions.
Communication <i>Expressing quantitative evidence in support of the argument or purpose of the work (in terms of what evidence is used and how it is formatted, presented, and contextualized)</i>	Uses quantitative information in connection with the argument or purpose of the work, presents it in an effective format, and explicates it with consistently high quality.	Uses quantitative information in connection with the argument or purpose of the work, though data may be presented in a less than completely effective format or some parts of the explication may be uneven.	Uses quantitative information, but does not effectively connect it to the argument or purpose of the work.	Presents an argument for which quantitative evidence is pertinent, but does not provide adequate explicit numerical support. (May use quasi-quantitative words such as "many," "few," "increasing," "small," and the like in place of actual quantities.)

QL LEAP Rubric Categories

- Interpretation
- Representation
- Calculation
- Application/Analysis
- Assumptions
- Communication

Interpretation Competency Levels

4 – Provides accurate explanation of information presented in mathematical forms. Makes appropriate inferences based on that information.

3 – Provides accurate explanations of information presented in mathematical forms.

2 – Provides somewhat accurate explanations of information presented in mathematical forms, but occasionally makes minor errors related to computations or units.

1 – Attempts to explain information presented in mathematical forms, but draws incorrect conclusions about what the information means.

Bachelor of Arts

- The general education course with QL that students consistently while seeking a BA is MTH 105 Introduction to Contemporary Mathematics
- So I spoke with the MTH 105 team to develop a QL rubric for general education for BA students

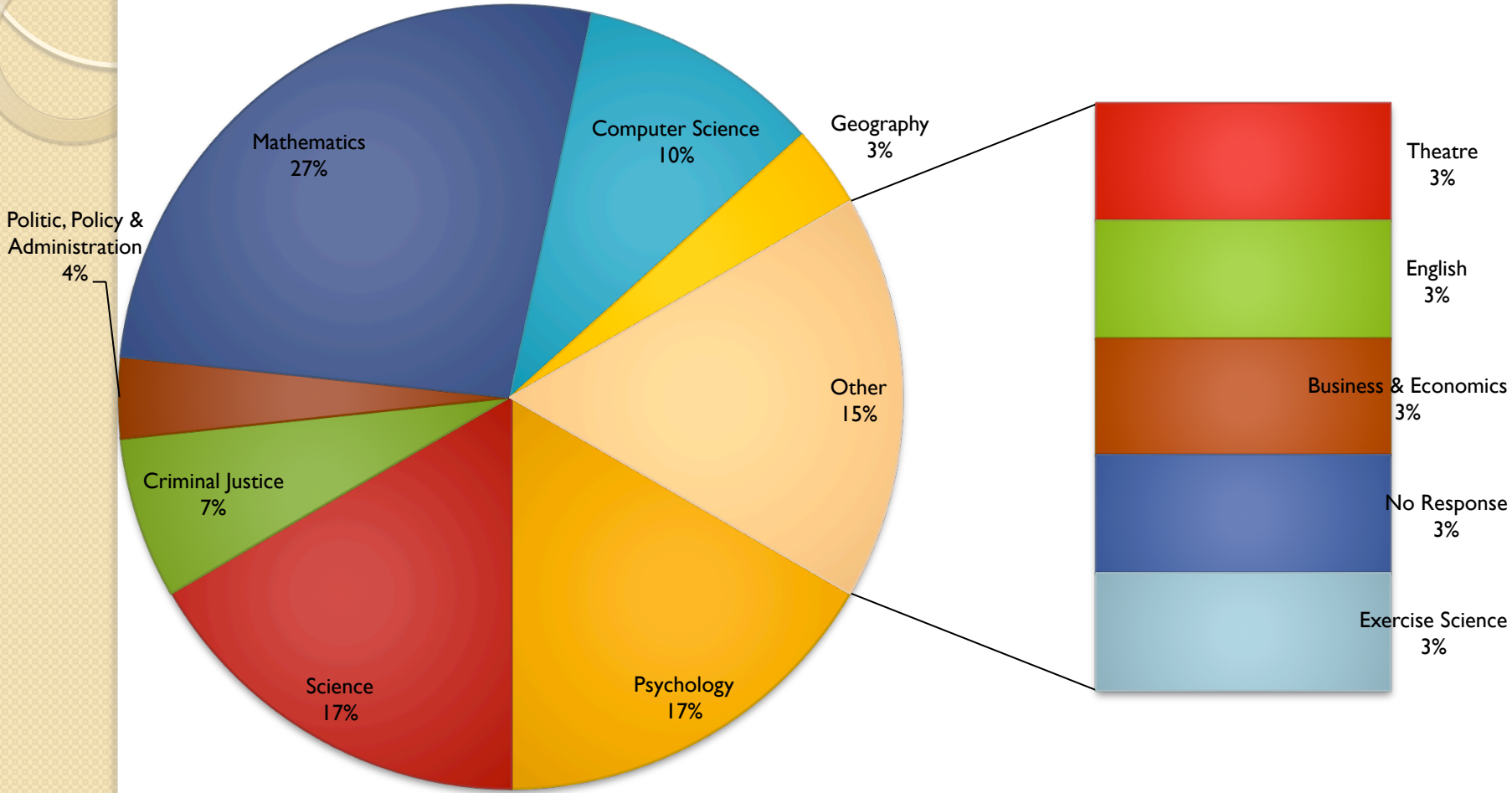
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Bachelor of Science

- There are many stakeholders of QL in general education for BS students
- I sent out a survey to 48 faculty members
 - Math department
 - CS department
 - Dean Monahan's QL group
 - Anyone identified by their division chair as being a stakeholder in QL

Reponses by Discipline



Survey

- The survey asked to rate the importance of each LEAP rubric category
- It asked the level of competency expected in each category in general education from a BS graduate
- It asked if there was any elements of QL missed in the LEAP rubric

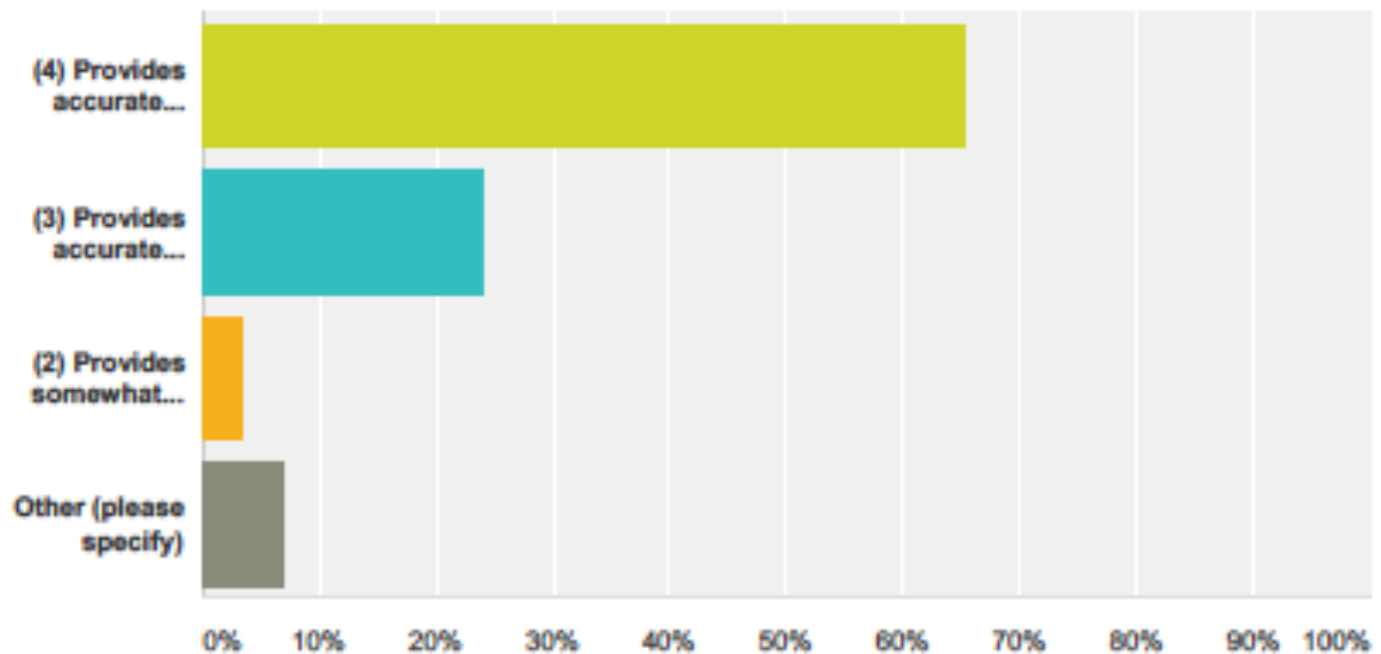
Results

- With 5 being very important, 3 being moderately important, and 1 being not important, each category had a mean between 4 and 4.5
- In each category, the faculty seemed to mostly agree on a competency level
- There wasn't a common thread in the comments about any missed elements on the QL rubric

Results for Interpretation

Q5 What level of competency do you expect from a BS graduate?

Answered: 29 Skipped: 1



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- Thank you for listening

- Questions?