

## Cal Poly Quantitative Reasoning Learning Community 2015-16

May 11, 2016

9:10 am to 10:00 am (33-285)

### Membership

Jack Phelan/Acad Prog; Mary Pedersen/Acad Prog; Bruno Giberti/Architecture; CAED; Thomas Fowler/Architecture; Gary Clay/Landscape Architecture, Susan Mackenzie/RPTA, Michael Latner/Political Science; Kevin Ross/Statistics; Todd Grundmeier/Mathematics; Fred DePiero/CENG; Russ White/Library; Gary Laver/CLA

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### MEETING NOTES

#### 1. Activity: QR Rubric ~ Filling in the Performance Descriptors

##### a. QR Rubric

- i. Kevin Ross introduces a new assignment for STAT 130. Discussion ensues on having separate questions addressing single dimensions or single question addressing multiple dimensions of the rubric. Bruno Giberti responds one question addressing 4 dimensions is more of what is desired.
- ii. Kevin R. describes the sample embedded question for STAT 130's final exam: When looking at each group, the median is higher in 1982 and 2013. Student are expected to understand what the implication of the data in this context is. More appropriately how the racial makeup is related with the quantitative information that is provided. The students are asked to read the graph and understand the complexity of the information provided and write a paragraph of 3 – 6 sentences responding to the graphic. Kevin adds 3 maybe 4 of the QR rubric traits are incorporated in this particular question. He also adds, most students will find this question challenging.
- iii. The question is appreciated by the other members of the committee. Michael Latner appreciates the question as a nice selection. On one hand the students are required to see the pattern, and at the same time they have to go beyond the pattern for deeper understanding and assumptions.
- iv. This question will be published in the (May 12, 2016) exam, Kevin R. will be scanning the answers, and then present to the group and the group will examine this questions further. Regardless, we will have these answers (data) captured if needed.
- v. Kevin R. shares that there are 65 students enrolled in the STAT 130 course.
- vi. Responding to Jack Phelan's question on who qualifies for the stipend for the faculty who will be invited to review the assignments, Mary P. clarifies that the stipend will be provided to the faculty who do not have a 12 month appointment.
- vii. Discussion resumes on the STAT assignment. Regarding the student response to questions which are out of the topics covered in the class, Michael L. shares his experience that when teachers go beyond what has

been covered in the class the students struggle with answering the question. Kevin R. adds, he covered 'percentage' and also covered the concept of 'mean' in one example. He expects that the best students must get it.

- viii. Bruno G. refers to the rubric, it is expected that 80 percent student must understand the problem. Kevin R. says, for this STAT assignment the percentage of the students completely grasping the problem will be less than 80%. He adds for this assignment if the students recognize the puzzle and why it's happening that should be defined as meeting the expectation. Bruno G. adds to the discussion, in terms of the rubric, students are not required to understand all the variables but understand some of the variables. The students must show awareness if not precision. And obviously high performing students might show full awareness of the problem.
- ix. Responding to Bruno G.'s analysis Fred DePiero adds that the same as 'awareness', 'understand' is an enigmatic problem or term as well.
- x. Bruno G. follows on, if providing a compelling argument seems like a high standard what should be the next levels down, 'provide some rational explanation' / 'lacking any considerable rationale'. Some of the terms that come up from other members of committee are 'Workable rationale', 'plausible rationale', 'partial rationale' and 'adequate'. Kevin R's description in the STAT 130 assignment quotes 'plausible explanation'.
- xi. Bruno G. continues on the analysis part of the question, the minimum expectation is if the student can read this. Gary L. adds to it that the categories are mixed up. Analysis is mixed up with problem identification.
- xii. Mary P. says, when looking through the student artifacts, by looking into one aspect in one set of artifacts can be beneficial. The committee can walk through some of the artifacts, delineate what those pieces are, and the group can look through it.
- xiii. Bruno G. continuing on the different levels of analysis says, posited on the mastery level rather than the foundational level if the student's ability to analysis is defined by how they draw conclusions, what would be the minimum level of expectation in this case (STAT assignment) and what descriptors would be better than that? Kevin R. answers, somewhere in the middle would be if the students can understand that the changes are dependent on the racial configuration, and the influences it has on the numbers. A gold star for the student would be, if anybody wants to know what the racial configuration is.
- xiv. Mary P. referring to the analysis part in the [QR value rubric](#), defines capstone and tries to relate different levels according to the terms that are using in their rubric. Capstone is defined as 'Uses the quantitative analysis of data as the basis for deep and thoughtful judgments', which then steps down from 'deep thoughtful judgement' to 'reasonable and appropriately qualified conclusions' in milestone 3. It then steps down to 'Uses the quantitative analysis of data as the basis for workmanlike (without inspiration or nuance,

ordinary) judgments, drawing plausible conclusions. Benchmark is defined as, tentative basic judgment, hesitant and uncertain.

- xv. Fred D. relates, if the student picks the right tool and does good that is maximum achievement. Below expectation will be, if the student don't know what the tool is that is required to be used. Middle group should know what tool to use but they might not use the tool well.
- xvi. Bruno G. expresses his concerns on representation trait, representation comes before analysis. Representation is used somewhere behind when expressing the data, students do that before conclusion. He suggests flipping the rubric may be an option. He asks Gary on where he thinks the representation part stands in relation to the PSY assignment. Gary L. replies that, "It's much more cut and dry - so very appropriate, targeted and focused to recognizing a very tightly wrapped problem. Do you see a common denominator? The question asks for proportion and is perfectly appropriate. At least these two questions are limited in scope - appropriately so." Mary P. adds to this that even these traits are intellectually different, applying the argument, representing and analyzing, for a student these are inseparable as one problem. They might have trouble on thinking these through separately. She adds that partly she used to think representing numbers with graph is an example of representation. Bruno G. argues that, communication and representation are not same. Fred D. adds, interpreting quantitative information through graph is not representation - that is part of analysis. That is asking to use the tool, and should not be called representation.
- xvii. Kevin R. acknowledges 3 steps to quantitative information, 1. Reading the data, 2. Arranging the data, 3. Visualizing the data. Ultimate goal is to make an effective argument. In a case like this referring to STAT assignment he says, when students are consumers, it is not really addressed to produce an argument. Student should correctly understand what analysis is going on here. They are literate on it. They are not expected to do it, but understand what the conclusion that is drawn is.
- xviii. Bruno G. continues on the discussion of analysis, there is general idea of analysis, including expressing and organizing quantitative information in a way that makes an argument.
- xix. Jack P. relates the difference between consuming and producing argument as GE level versus senior level.
- xx. Bruno G. states the rubric should define foundational level, student being the consumer of the data.
- xxi. Mary P. adds, the students should be questioned on the graphs that are provided in the question as these are good representation of the data. What can be a better representation of the data? The question must look for students who can recognize that quantitative literacy.
- xxii. Gary L. asks Kevin R., whether he expects the students to recognize the incompleteness of information in the question. Bruno adds to that, whether he

thinks even if the table of data were being presented, students with low sense of literacy would understand.

- xxiii. Discussion ensues on the difference between interpretation and representation. Bruno G. says regarding Representation of information and Reception of information, only a scholar in English can finalize the terminology and the differences. Fred D. adds to it being literal, organization of data should be a measure of student's ability to representation of quantitative information. Bruno G. expresses his concerns that though for high students that might seem correct, but at foundational level it may not. The students are not wanted to construct an argument but only understand the argument. Jack P. includes that both [Math assignment](#) and [ECON assignments](#) are designed for the performing level. Majority of the students at foundational level who are taking STAT 130 will be on the consumer level. Difference and diversity in the assignments will be a process to understand the flow of students from consumer level to the producer level. Bruno G. says, this should give a way to identify students in one level and across levels.
- xxiv. Fred D. says referring to the domain expert explanation after the presentation of the leader; questions were raised on holding the entire dimension in one question. The decision was not to hold all the dimensions. That is what should be done with the assignments according to Fred.
- xxv. Jack P. says for the next meeting, the evaluation of the rubric will continue, and will be taken to the next level and requests Kevin R. to bring the pilot results from the STAT 130 assignment.
- xxvi. Bruno G. concludes that the rubric lacks appropriate interpretation. Statements don't necessarily go back and forth and that's confusing. Valid and reliable measures are required.

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**Spring 2016 Schedule**

~~Wednesday 4/13 9:10 am to 10:00am 33-285~~

~~Wednesday 4/27 9:10 am to 10:00am 33-285~~

~~Wednesday 5/11 9:10 am to 10:00am 33-285~~

Wednesday 5/25 9:10 am to 10:00am 33-285