

## General Information

Core Category Discussed: Quantitative Analysis

Current Semester: Spring 2016

Date of Assessment Meeting(s): May 17, 2016

## Participants in Assessment Meeting

Tom Short, Andy Welki, Colin Swearingen, Graciela Lacueva, Peter Kvidera, Rodney Hessinger, and Sara Schiavoni

## Courses Offered in Fall 2015

EC	208	51	Business and Economics Statistics 2	A. Welki
EC	208	52	Business and Economics Statistics 2	A. Welki
EC	208	53	Business and Economics Statistics 2	A. Welki
EC	208	54	Business and Economics Statistics 2	O. Gooden
ED	101	51	Making Sense of Data	Y. Shang
ER	115	51	Quantitative Analysis in Science, Business, and Humanities	M. Lynn
MT	122	1	Elementary Statistics	S. Dinda
MT	122	51	Elementary Statistics	W. Marget
MT	122	52	Elementary Statistics	W. Marget
MT	122	53	Elementary Statistics	L. Malik
MT	122	54	Elementary Statistics	B. Feister
MT	122	55	Elementary Statistics	R. Kolesar
MT	122	56	Elementary Statistics	T. Short
MT	122	57	Elementary Statistics	T. Short
MT	228	51	Statistics for Biological Sciences	T. Short
PO	105	51	Political Analysis	C. Swearingen

## Courses Offered in Spring 2016

CH	261	51	Analytical Chemistry	M. Setter
CH	263	51	Analytical Chemistry Lab	A. Varnes
CH	263	52	Analytical Chemistry Lab	R. Simmons
CH	263	53	Analytical Chemistry Lab	R. Simmons
EC	208	51	Business and Economics Statistics 2	A. Welki
EC	208	52	Business and Economics Statistics 2	A. Welki
EC	208	53	Business and Economics Statistics 2	O. Gooden
EC	208	55	Business and Economics Statistics 2	O. Gooden
EC	208	57	Business and Economics Statistics 2	W. Simmons
ED	101	51	Making Sense of Data	Y. Shang
MT	119	51	Quantitative Analysis	R. Kolesar
MT	122	1	Elementary Statistics	S. Dinda
MT	122	51	Elementary Statistics	W. Marget
MT	122	52	Elementary Statistics	W. Marget
MT	122	53	Elementary Statistics	D. Stenson
MT	122	54	Elementary Statistics	P. Chen
MT	122	55	Elementary Statistics	R. Kolesar
MT	228	51	Statistics for Biological Sciences	S. Dinda
MT	228	52	Statistics for Biological Sciences	T. Short
MT	228	53	Statistics for Biological Sciences	T. Short
MT	229	51	Probability and Statistics	W. Marget
PO	105	51	Political Analysis	C. Swearingen
PO	203	51	GIS	C. Swearingen

## Typical Assessment Process

Faculty members teaching a class in this category are asked to select at least one assignment that addresses each learning goal (with the possibility that one assignment may address multiple goals). For at least ten students in each course, as part of (or parallel to) grading those assignments, the faculty member completes the committee-approved rubric and then provides the scores as well as the original student work to the Core Committee. Each semester, the category subcommittee assesses a sample of student work from the previous semester focusing on work connected to the specific learning goal(s) listed in the core assessment schedule. **The focus for the 2016 meeting is Precise questions, draw inferences, represent data.** The assessment meeting, held at the end of the Spring semester each year, focuses on data from the previous spring semester and the most recent fall semester. (Preliminary instructor-produced data for the current semester is also examined when available.)

## Deviations from the Assessment Process

Because fall 2015 was the first semester of the new integrative core, there were no integrative core classes offered in fall 2015; therefore, this meeting will make use of assessment data from fall 2015 and preliminary data from spring 2016.

## Attachments Containing Assessment Data and Instructor Feedback

QA Rubrics; QA Assessment Report Fall 2015; QA Assessment Report Spring 2016 Preliminary; QA Feedback 2016, QA Preliminary Canvas Data 2016

## Findings

*Prompt:* Describe, in words, what your subcommittee has learned about student learning during this assessment cycle. What were the strengths? In what ways did students fail to meet the goals set for them?

Please see the accompanying QA Assessment Reports for Fall 2015 and Spring 2016.

Across all sections of QA in Fall 2015, students seem to have experienced the most success in the dimensions of Representing Data and Thinking Critically. These two dimensions had the highest mean assessment scores (both 3.3 out of 4) and relatively small standard deviations (0.81 and 0.77, respectively).

Students seemed to be moderately successful in the dimension of Finding and Posing Questions, with a mean score of 3.2 and a relatively large standard deviation of 0.98.

Students were less successful in Drawing Inferences and Identifying Sources of Error. In both of these dimensions, the average scores were 3.0, and both had relatively large standard deviations (0.96 and 1.03, respectively).

The weakest mean scores within specific courses for Drawing Inferences were in EC 208 (2.5) and MT 228 (2.8). The weakest course-specific mean score for Identifying Sources of Error was in MT 122 (2.1).

Preliminary results from five Spring 2016 QA sections indicate that Identifying Sources of Error had the highest mean rating at 3.5. The lowest average was associated with Thinking Critically (2.9), while the means for Finding and Posing Questions, Drawing Inference, and Representing Data fell in between. Overall, the standard deviations are naturally smaller than those for the more complete set of results in Fall 2015, since the preliminary Spring 2016 results represent only five sections across only three courses taught by only three different instructors.

## **Suggestions for Instructors**

*Prompt:* Do any of your findings translate into helpful suggestions for all instructors teaching courses with this designation? Are there areas that need more emphasis? What would be the best mechanism for delivering this feedback? (Possible mechanisms might include an e-mail from the committee, a message delivered at a fall orientation session, a faculty development workshop.) If not obvious, please explain the connection between your findings and these suggestions.

It is premature to communicate interpretations of the findings to all QA instructors, because the Spring 2016 dataset is not complete.

Clearly there needs to be more dissemination of the definition of QA, accompanied by examples for instruction and assessment. We offered a workshop at the beginning of Fall 2015, and perhaps future workshops offered more frequently would be helpful. Continuing to share guidelines and results of assessments is important, but perhaps a greater number of specific examples for assessment could be made available.

Although QA is defined in the Integrative Core document, there remains uncertainty among faculty about its definition and interpretation. There exist approved examples of QA courses that are not traditional introductory statistics courses, but there is still pressure to broaden the definition of QA.

## **Evaluation of Processes**

*Prompt:* Describe, in words, your subcommittee's evaluation of application and assessment processes. What works well? What needs improvement? (All processes should usefully provide data with a reasonable amount of effort.)

The subcommittee encouraged Fall 2015 QA instructors to submit their assessment results according to guidelines distributed at the beginning of the semester, and most completed this task. The subcommittee consolidated the numeric results of the assessments, while being aware and mindful of the variety of artifacts with accompanying student work that formed the basis for the scores. Preliminary data for Spring 2016 is already available through Canvas, and we are summarizing it in a similar manner.

We will look to the Integrative Core Committee and the Director of Assessment for guidance about changes to the application and assessment processes, including consideration of implementing reviews of instructor assessments and explorations of inter-rater reliability.

## **Recommendations for Internal Changes**

*Prompt:* This section pertains to changes that can be made by the subcommittee and the assessment office. What changes, if any, do you need to make to your application or assessment processes or to other aspects of the core designation? If not obvious, please explain the connection between your findings/evaluation and these recommendations.

The recent QA faculty Assessment Survey revealed some less than "Extremely Positive" ratings for the QA Application and Approval Process, and not all of the ratings of support received were "Enough." Comments focused on the lack of breadth in the definition and interpretation of QA, both by the QA Subcommittee and in the Integrative Core document itself.

Not all faculty responding to the survey thought that the QA learning goals were reasonable and appropriate. There seems to be some confusion about very specific topics being sufficient or required for QA courses. The Integrative Core document's definition of QA does not mention specific methods or skills.

Some faculty felt that the assessment process took too long relative to the work required to teach and to assess within a course. There also seems to be confusion about what materials are required to

accompany QA assessment submission. The QA Subcommittee must communicate requirements more clearly to faculty teaching QA courses.

At the Annual Assessment meeting we discussed providing common assessment questions to either all or a subset of students in QA courses, specifically to assess the transferability of QA concepts beyond the context of one specific course. We feel that freshmen in particular might find it challenging to master QA content and the context within which it is encountered, and consequently may not develop a deep enough understanding to transfer the concepts to other contexts.

It is not clear what pressure the QA Subcommittee, the Core Committee, and the Assessment Office can bring on individual faculty who provide incomplete or delayed assessments. Once a new semester begins, it seems that faculty have less time and motivation to complete assessments from a prior semester. This effect may be diminished over time, as faculty adjust to the rhythms of a mature QA assessment process. It is also challenging to obtain complete assessment information from adjunct faculty, who may not maintain a consistent presence on campus over time or who may not be returning to JCU at all.

### **Recommendations for the Core Committee**

*Prompt:* This section pertains to changes that will require action by the entire core committee (and potentially the faculty). What changes, if any, do you need to make to application or assessment processes or to other aspects of the core designation, including learning goals, rubrics, and curricular requirements and/or structures. If not obvious, please explain the connection between your findings/evaluation and these recommendations.

Some discussion at the Annual Assessment meeting focused on the emphasis on QA in Exploring the Natural World (ENW) courses. The Core Committee may choose to consider options such as relaxing the QA prerequisite for ENW courses, relaxing the Writing requirement for ENW courses, modifying the QA Subcommittee's definition of "emphasis" to equate with one credit out of six in two ENW integrated courses, and selecting a subset of the five dimensions of QA that must be represented in ENW courses.

We hope that the Core Committee will continue to support development grants and workshops for QA. These will give faculty preparing proposals and courses opportunities to interact with the QA Subcommittee in order to provide students with the best chance for success while being respectful of the Integrative Core document. We hope that the Core Committee will continue to mediate the tension between the QA Subcommittee and individual faculty and departments who disagree with interpretations and policies.

Some faculty expressed concern about scheduling pressures due to integrated courses, and some faculty requested specific support on using Canvas to implement rubrics. There is also concern that the burden of developing related courses – such as QA and ENW courses – stretches some individual faculty members too thin.