Core Curriculum Assessment 2016-2017

- Empirical & Quantitative Skills
- Teamwork

All of the Empirical criteria require some sort of written, graphic, or oral communication.

1. *Interpretation* requires students to explain and draw inferences from quantitative data. To assess students in *Interpretation,* we need to see both what the student is interpreting and what the student says about it. If faculty can include an example of a good response or a description of what a good interpretation might say, that helps considerably.

2. *Representation* requires students to translate information into mathematical or infographic form. To assess students in *Representation*, we would need to see both the data that they are translating and their translation. Note that a good *Interpretation* of raw data might require *Representation* in graphical form in addition to any writing, and that such an artifact would enable assessment of both criteria.

3. *Calculation* is trickier than it might look, when it comes to assessment. The AAC&U rubric requires "comprehensiveness" and steps for Level 2 and 3 performance. This means that any artifacts related to *Calculation* should involve fairly meaty problems and require students to show their work. If they write out their steps, this work may also enable assessment of other criteria.

4. *Application/Analysis* requires students to "draw appropriate conclusions based on the analysis of data, while recognizing the limits of this analysis." In other words, it builds on *Interpretation*, taking the interpretations of data another step toward application of those findings: proposing solutions, for instance.

> ***Note.*** A brief paper in which the student *Interprets* raw data, enhances that *Interpretation* with *Representation* (translating raw data into a graph, for instance), and then makes qualified recommendations based on those findings (*Application/Analysis*) checks off **three** criteria – which is exactly enough for assessment needs.

5. *Assumptions* requires that students "make and evaluate important assumptions in estimation modeling and data analysis" – that is, to meet this criterion, students need to be defending methodological assumptions they are making in their *Interpretations* or *Applications/Analyses*.

> ***Note.*** The *Assumptions* criterion substitutes well for *Representation* in the example given above, if the assignment calls more for methodology than for graphical translation.

6. *Communication* requires that students *employ and explain* quantitative evidence in service of some kind of argument or "purpose of the work." (Because the phrase we just quoted is vague, we encourage using *Communication* only for arguments.)

7. *Evidence Analysis* is a Critical Thinking skill that we have cross-listed on the Empirical rubric. It requires students to "organize and synthesize evidence to reveal insightful patterns, differences, or similarities." *Evidence Analysis* may be a useful criterion for empirical disciplines outside of Mathematics in which students are working more with scientific content than with numbers.

8. *Textual Analysis* is a Critical Thinking skill that we have cross-listed on the Empirical rubric. It requires students to break down texts into discrete elements and analyze those elements for patterns "to build knowledge or insight within and across texts and disciplines." *Textual Analysis* may be a useful criterion for discplines outside of Mathematics in which students are working more with texts than with numbers. Because textual units (word tokens, types of phrases or clauses, sentence lengths, etc.) can be counted, this criterion can combine effectively with *Communication, Application/Analysis*, and *Interpretation*.

9. *Define Problem, Propose Solutions/Hypotheses,* and *Evaluate Potential Solutions*. This set of three problem-oriented criteria may be employed in tandem for any assignment in which students must draw on empirical or quantitative resources to propose solutions and evaluate them.

10. *Research Design* requires students to propose responsible methodologies in their approach to a study or experiment. Note that this criterion can be combined with *Define Problem, Communication,* and *Assumptions* to round out a set of 3 or 4.

Teamwork is tricky. For instance, to assess a student's contributions to, or role within, a group project, we have to be able to see what each individual member did – and be able

to identify which student is the one we're assessing. In a videotaped group activity, that may require that each participant introduce herself before speaking.

TECH TIP

Blackboard's **Collaborate** tool may be one of the better tech solutions we have for the challenges of Teamwork assessment. The Collaborate tool enables recordings of team activities—with students clearly and automatically identified! By having students negotiate, deliberate, or cooperatively plan within a Collaborate session, you can collect artifacts that can be assessed on a range of criteria from the Teamwork rubric.

Indeed, you can use Collaborate to handle Teamwork assessment for large classes with hundreds of students.

One approach looks like this: The week before a big test, put the students into small "study groups" (4-5 students each) and give each team an online, collaborative, problem or challenge to work through via Collaborate – one that will prepare them for questions you know will be on the test. Tell them that this is what you're doing, and set the Collaborate session to automatically record. The challenge or problem should be one that requires or encourages discussion, debate, negotiation.

When the students are done, all you need to mark off is whether they participated, and award participation credit to those who have. The test itself "grades" each individual participant, as those who engaged in the process will likely do better than those who did not.

If you've grouped all of your sampled students, so that they are on the same teams, collection should be a snap. To make artifact collection even easier, please find and self-enroll in the **Core Curriculum Assessment** organization shell on Blackboard. We will be posting guidance in that organizational shell to help faculty get their Collaborate sessions to us without having to do a lot of downloading and uploading of large files. (Please feel free to contact Gray Scott at grayscott@twu.edu for advice or help on setting up such sessions.)

The Teamwork criteria listed below include quite a few that are cross-listed from the Social Responsibility and Personal Responsiblity rubrics, as well as a set of three new peer-review criteria. The former may be useful to disciplines that must assess both Teamwork and Social Responsibility, as Creative Arts does, or both Teamwork and Personal Responsibility, as Communications does.

1. *Stage of Group Development*. An unusual criterion, this is the only one in the list that is assessed at the group level. It results in a holistic judgment on how functional (or dysfunctional) the group as a whole is, based on how well they can exchange honest opinions without resorting to bickering or personal attacks.

2. *Embracing Contradictions*. The ability to understand and synthesize or analyze multiple, conflicting perspectives correlates well with the ability to work with

others. For this reason, *Embracing Contradictions* can be used to get a sense of Teamwork ability even if the work being assessed was created by an individual.*

3. *Applying Criteria through Peer Review, Constructive Framing of Peer Review,* and *Clarity of Peer Review* can be applied as a set of three criteria to any assignment that requires students to evaluate each other's performance according to assigned or established criteria. However, in order to assess the *accuracy* of their peer reviews, raters will need to see both the review and the object being reviewed, and raters will need to be able to tell which is which.

4. *Contributes to Team Meetings, Individual Contributions Outside of Team Meetings, Facilitates the Contributions of Team Members, Fosters Constructive Team Climate,* and *Responds to Conflict* all require some kind of detailed record or recording of team meetings. Recordings from Blackboard's Collaborate tool may be particularly helpful for capturing such meetings.

5. *Follows Directions of Conductor, Captain, or Director; Handles or Sets-Up Shared Property;* and *Responding to Director Feedback* are a set of three criteria created by the Music Department but written in such a way that they can be employed in any situation that is a) attended by live raters, or b) recorded, with performers identified. While many of the earlier criteria emphasize *deliberative* Teamwork (wherein the goal is to negotiate or argue toward a group decision), the three criteria created by the Music Department are built for *performative* Teamwork, in which everyone is expected to coordinate or synchronize according to a common or leader's vision.

6. *Limitations and Implications* requires that students acknowledge relevant limits to their own analyses or findings or methods and/or the implications of those findings, methods, or analyses. Doing this properly requires the ability to see one's own arguments or perspectives from an outside perspective, and thus connects to the Teamwork objective. Like *Embracing Contradictions*, this criterion can be assessed even in a solo assignment.*

7. *Perspective Taking, Cultural Diversity, Attitudes (Curiosity, Openness), Knowledge (cultural self-awareness, cultural worldview frameworks), Skills (empathy),* and *Diversity of Communities and Cultures* all emphasize the ability to understand, empathize with, and communicate with people from other backgrounds, perspectives, and cultures. As such, all of them fit the Teamwork theme, even if they are all cross-listed with Social Responsibility. Moreover, all of these criteria can be assessed at the individual level.*

* Even though the asterisked items can be assessed at the individual level, classes under the Teamwork objective should still provide students with collaborative and/or cooperative activities, even if those activities are not used for assessment purposes.