COURSE ASSESSMENT REPORT (CAR)

OVERVIEW OF THE PROCESS

Units will complete one Course Assessment Report (CAR) for each semester data are collected, regardless of how many sections are being assessed. If multiple sections of a course are being assessed, each faculty member will receive a copy of the CAR so that they can complete sections B and C before it is compiled into one report.

DO NOW
- Look at the spreadsheet for the section you are collecting assessment data from.
- Determine how you will teach and assess learning for each of the content and skills goals (we encourage you to collect data toward the end of the semester).
- Log in to the GE assessment database so you are familiar with where you will enter the data: http://intranet.gvsu.edu/courseassessment

DO DURING THE SEMESTER
- As you teach students about the GE content and skills goals, please enter the information about the TEACHING METHODS you used (Section B).
- As you develop the specific assessment measures you will use (a test question, report, presentation, etc.), enter the information on the ASSESSMENT METHODS (Section C).
- Once you've collected the assessment data, each faculty member should go online and enter the assessment data. Please complete your online data entry by the end of the semester (Dec. 31 for Fall and April 30 for Winter).

DO AFTER THE SEMESTER
- We will send you a tables and figures that summarize the data you collected (we will send one set of tables and figures regardless of how many sections collected data. Upon request, we will send you the results for individual sections). Copy and paste them into the Results (Section D).
- Complete the ANALYSIS (Section E), FUTURE ACTIONS (Section F), and Involving the Stakeholders (Section G).
- Email the completed CAR to gened@gvsu.edu by Feb. 1 for data collected in the Fall, and by May 15 for data collected in the Winter.

A. BACKGROUND

1. Course number: STA 340

2. Course title: Statistics in the Media

3. How many sections were assessed: 1

4. Year of the assessment: 2015   Term of the assessment: __ Fall _X_ Winter __ Spring

5. General Education Category (check all that apply)

FOUNDATIONS
    ___ Arts   ___ Historical Perspectives
    ___ Life Sciences   ___ Mathematical Sciences
    ___ Philosophy and Literature ___ Physical Sciences
    ___ Social and Behavioral Sciences ___ Writing

CULTURES
    ___ U.S. Diversity   ___ World Perspectives

ISSUES
    ___ Globalization
    ___ Health
    ___ Human Rights
    ___ Identity
    _X_ Information, Innovation, and Technology
    ___ Sustainability

B. TEACHING METHODS

One of the expectations for GE courses, is that faculty distribute and explain the rubrics to students.

6. Did you distribute all of the General Education Skills rubrics that are associated with the class? If you did, was it helpful? If you did not distribute all of the rubrics, please briefly explain why you chose not to do so.

I did. I included the GE attachment as the first two pages of my syllabus, and went on to include the below text later in the syllabus:

Gen Ed: As you know, this is a General Education Issues course. As you learn about statistics in the media and how that relates to information, innovation, and technology, you will learn skills for collaboration, integration, and problem-solving. Visit

http://www.gvsu.edu/gened/ for more details. Examples of STA 340 assignments that measure the skills goals follow.

Collaboration: A group project/presentation involving data collection, analysis, and graphics. Will include self and peer assessment reflection papers.

Integration: You will be asked to read a news story on a recent study, along with the original source (the journal article). You will write a short paper that summarizes the journal article and critiques the news story. In the paper, you will relate the two sources, along with your own experience.

Problem solving: See the example for collaboration. As part of the group project(s), you will be asked to make a problem statement in your project proposal.

Skills development trajectory in Gen Ed courses (a.k.a. rubrics): Rubrics for the three skills goals are posted to the Blackboard site for STA 340. Regarding these rubrics, please realize that they are meant to measure students as they progress toward graduation. Scores from the rubrics aren't intended for determining grades in the course. Rather, they are used for university assessment purposes, and can be used to let students know where they stand at the end of the course. This is a way for students to track their own progression as they attempt to achieve mastery over time.

I projected the rubrics on the screen, and tried to downplay the definitions for each level of mastery, instead stressing the four objectives that comprised each skill. I think it was helpful; I was grateful to be able to lean on something that was bigger than my concept of the course as the professor. In other words, it wasn't simply my idea to have the students learn collaboration, integration and problem solving. For what it's worth, I never heard any complaints about the rubrics, not even in the end-of-semester evaluations.

7. Your Course Assessment Plan (CAP) contains examples of how you planned to <u>teach</u> each of the content and skills goals.   For the Course Assessment Report please describe the <u>most important</u> things you did to teach the goals (you don't need to describe everything you did, but you may if you wish).

1. Goal 1: How the course relates to information, innovation, and technology.

    Describe what you did to teach Goal 1:

I used a book designed to teach how statistics are misrepresented in the media, and on a weekly basis, used recent examples in the news, on blogs, in published literature, etc. to illustrate points. I assigned readings from the book, from blogs and news websites, and from journal and magazine articles. I lectured with Powerpoint slides – I know that's not an impressive teaching technique in itself, but I felt that it gave certain class sessions structure, and I always left plenty out of the slides for the students and/or myself to fill in during class. All

group work was submitted by students posting to their group wiki on Blackboard; they were instructed to make their wiki page resemble a website (this is possible only to an extent within Bb). Since I am no expert on creating wikis in Bb, I brought in a guest – Vince St. Germain from GVSU's IDeL team – to demonstrate what is possible with a Bb wiki to my students.

2. Goal 2: How complementary and competing perspectives covered in the course contribute to the ongoing discussion about information, innovation, and technology.

    Describe what you did to teach Goal 2:

Much of what I said above applies here too – regarding complementary and competing perspectives, I compared news stories to the original source in class examples, and we discussed several graphical displays of data in class. Some of the displays were created by journalists in collaboration with statisticians (e.g. from nytimes.com), some were created by researchers in various fields, some by government, some by graphic designers, some by companies marketing their product, others by organizations intent on changing public perception, or even by academics interested in how people interpret numbers.

3. Goal 3: Collaboration — two or more students working together and sharing the workload equitably as they progress toward shared learning objectives.

    Describe what you did to teach Goal 3:

I assigned two readings: a 2000 article from the *Journal of Education for Business* titled "Using teams for class activities: Making course/classroom teams work" by James A. Buckenmyer, and a 2013 article from *Open Access Medical Statistics* titled "Generating productive dialogue between consulting statisticians and their clients in the pharmaceutical and medical research settings" by Birol Emir et al. The former included a checklist of what makes teams effective and was meant to give general guidance, while the latter was more specific (statisticians collaborating with doctors) and was meant to show what happens in practice. I assigned a reflective paper on the readings, which gave me insight on each student's attitude and approach to group work in the past.

Quick background: I created groups of 3 students mainly based on major/minor. I considered other factors like GPA, grade in the prereq (STA 215), answers to survey questions like "I'm more comfortable if I do all the work" agree/disagree, work schedules, etc., but it mostly came down to mixing students up based on major. I think it worked fairly well – I had just enough STA majors or minors to put one in each group, and I was able to honor two requests for roommates to be the same group.

The first group assignment was to write a contract that all members signed. I reviewed each group contract to make sure all expectations were reasonable and understood by all parties. For each subsequent group assignment, students were required to fill out a self/peer evaluation. In cases of conflict, I gave advice on how to work it out.

For all group work, students were required to fill out a self/peer evaluation, which asked them to rate themselves and their group mates on several criteria such as "Did his/her share of the work (quantity)," "Contributed useful ideas (quality)." Students gave values: 1=Strongly Disagree, 2=Disagree, 3=Agree, 4=Strongly Agree for each, and were also required to write a narrative to explain the values given. Some students did not write much of anything to explain their ratings, so I had to remind them that this was not optional. Other students would make curt statements like "we worked well together" for certain assignments; I could tell this was inaccurate based on the often eloquent (and sometimes damning) statements made by their group mates. In those cases, I had to call the student out not only on their "slacking" for the assignment, but on their negligence in reflecting honestly.

4. Goal 4: Problem solving — the process of designing and evaluating strategies to answer open-ended questions or achieve desired goals.

   Describe what you did to teach Goal 4:

One of the four objectives within this goal is to write a clear and concise problem statement. The most prominent example of this was the project proposal. All groups, in addition to several unrelated group assignments, were required to complete a semester-long project, which had a few components. In order, these were: proposal, data collection, analysis and visualization, and presentation. The following is text from the assignment of the proposal:

Refer to the Problem Solving Gen Ed rubric posted to the Bb site. All four of the objectives are relevant here, especially the first two. In proposing your project idea to me, you will construct a problem statement and identify a few approaches for solving the problem. Examples of "problems" include how media organizations cover election races, how government offices give health recommendations, or how companies use studies to promote their products, etc. Your project proposal should be very specific about how you plan to collect data, and should give some idea of how you expect to analyze it. The project idea must be agreeable to all group members, and the proposal must be approved by the professor. I won't assign a score to the project proposal right away; rather, it will be part of the project grade later. I expect you to periodically update your project proposal as you make more decisions on what you are doing for the project, and as I make suggestions for improving it. At the end of the semester, I will give it a score. Also, I must score it according to the General Education rubric for assessment purposes outside of this course. This isn't directly tied to your grade in STA 340, but please remember that the skills rubrics are there to guide you (click on the link on the left side of the Bb site). The first row of the problem solving rubric, which mentions problem statements, applies the most to your project proposal, but all four objectives under problem solving are relevant to your project proposal.

I met with each group weekly, and regularly encouraged them to update and improve their project proposals. I also encouraged them to view the proposals of other student groups to get ideas on how to make theirs better.

Regarding problem solving in general, I advised groups on how to overcome difficulties in data collection, analysis, and interpretation as needed for their project. All semester, I presented examples of data analysis that in some manner modeled problem solving. Given the nature of the course, many examples from the media illustrated how NOT to solve a problem.

5. Goal 5: Integration — the process of synthesizing and applying existing knowledge, past experiences, and other perspectives to new, complex situations.

   Describe what you did to teach Goal 5:

One way I taught this was to capitalize on the different fields of study represented in the classroom. For instance, many in-class examples stemmed either from psychology experiments or the psychology of people's understanding of statistics and probability. Since I had two PSY majors in the room, I could call on them to give their perspective (and I was lucky in that both students were willing and able to give very high quality input). Similarly, many in-class examples involved technology (e.g. graphing data, use of social media) and the course required students to use technology (e.g. wikis), so I could draw on the experience and expertise of the CIS majors in the room, who were likewise very capable of valuable contributions to the discussion. Oddly enough, the STA majors were not as reliable in this regard; perhaps I expected too much of them.

Many examples in class used statistical methods either in the realm of "STA 215 review" or a slight extension, so I certainly needed my students to apply their existing statistical knowledge to new situations. For example, students had prior exposure to linear regression and the chi-square test, and both methods were used in STA 340 – to illustrate Simpson's paradox in particular.

C. ASSESSMENT METHODS

8. Your CAP contains examples of how you planned to <u>assess student learning </u>of each of the content and skills goals associated with your class. For the Course Assessment Report please briefly list the measures you actually used to assess student learning (for example, include the test question you used or the instructions you gave for a report, etc.). [If you handed out 2 pages of directions for a report, please summarize the essence of the assignment.]

1. Goal 1: How the course relates to information, innovation, and technology.

   Measure(s) for Goal 1:

For this I used final exam questions #9, 11 and 12 (see below). #9 was multiple choice, #11 and #12 were short answer. #9 gave an example of how the media often extrapolates results into the future without a real basis, #11 tested the students on their ability to distinguish between odds and probability using a classic example from advertising, and #12 tested the students on their ability to comprehend a relative percentage increase using an xkcd comic strip.

9.) What type of statistical error is being made in the following statement? "If this uphill linear trend continues, 50 years from now, one out of every three of us will be an Elvis impersonator."
   a) Extrapolation
   b) Exaggeration
   c) Overprediction
   d) Expectation

11.) For many years, Trident Gum used the following marketing slogan: "4 out of 5 dentists surveyed recommend sugarless gum to their patients who chew gum." Assuming this is true, what are the odds of a dentist recommending sugarless gum to a patient who chews gum?

12.) Briefly explain how the figure in the comic is able to say that his religion grew by 100%.
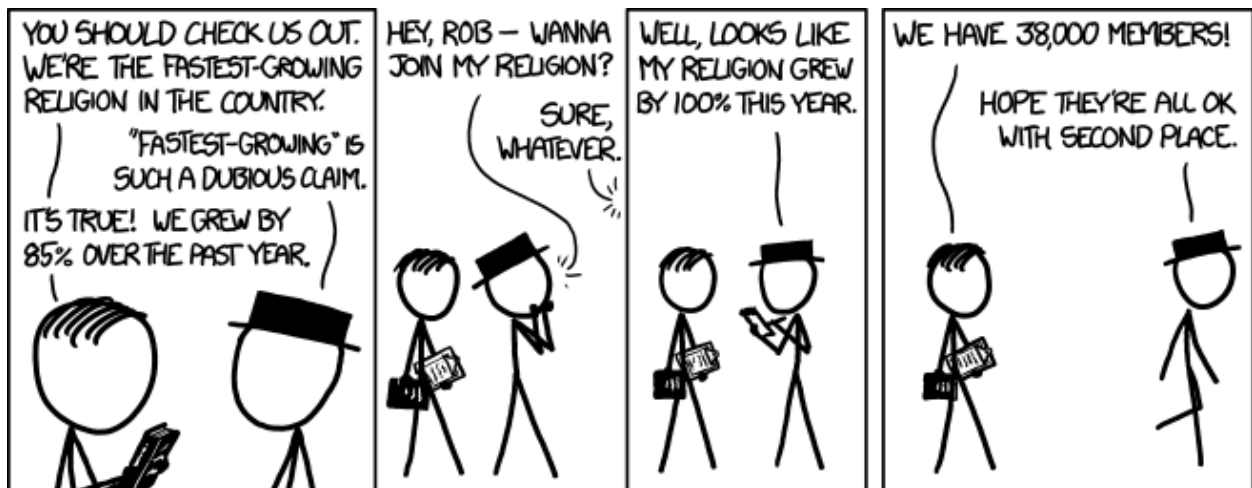
My rubric here was simply:
4 = all correct, with an especially insightful answer to #12
3 = all correct
2 = something wrong
1 = a great deal wrong
0 = all wrong

   2. Goal 2: How complementary and competing perspectives covered in the course contribute to the ongoing discussion about information, innovation, and technology.

       Measure(s) for Goal 2:

For this I used final exam questions #22 and 23 (see below). Both were short answer. #22 gave an example of a media story about a recent study. The students had to identify the study being reported on as being an observational study and relate this to the headline, which is much too strongly worded in a cause-and-effect manner than it should be. #23 showed an infographic

ad, which is distorted. This is commonly the case, but the twist here is that the disproportionality of the bars does not favor the company presenting the ad.

22.) A story appeared on consumer.healthday.com with the headline "More TV Time May Mean Higher Diabetes Risk, Study Finds." Consider the following excerpt from the story:

> If you're on the verge of developing diabetes, parking yourself in front of the TV might be one of the worst things you could do for your health, a new study suggests. Every extra hour a person with prediabetes spends watching TV each day raises their risk of developing full-blown type 2 diabetes by 3.4 percent, according to research published April 1 in the journal Diabetologia. The study couldn't prove cause-and-effect. But the increased risk associated with being a couch potato occurred whether or not the study participants were taking diabetes drugs, or whether or not they were eating healthy diets and exercising, the researchers found.

Was this an observational study or an experiment? Briefly comment on the validity of the headline in light of this.

23.) The following was taken from a Republic Wireless infographic advertisement. Briefly comment on the graph. Is anything misleading about it?
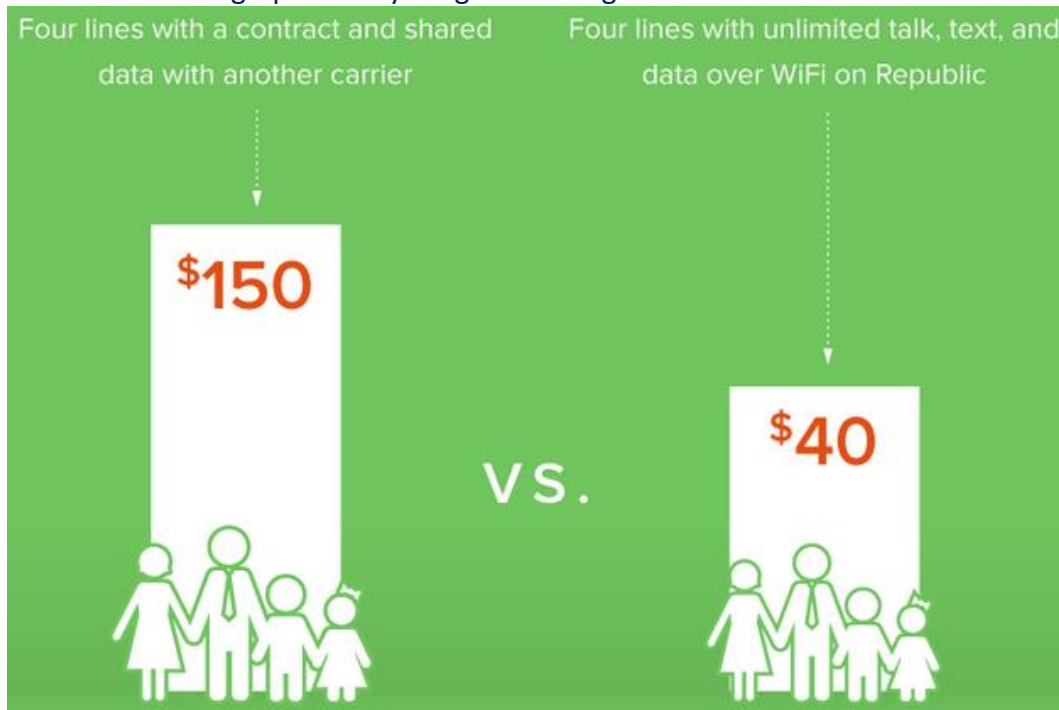
My rubric here was simply:
4 = all correct, with especially insightful answers
3 = all correct
2 = something wrong
1 = a great deal wrong
0 = (almost) all wrong

3. Goal 3: Collaboration — two or more students working together and sharing the workload equitably as they progress toward shared learning objectives.

Measure(s) for Goal 3:

Background: Students did both individual and group work. I put the students in groups very early in the semester, assigning six group assignments (unrelated to the project) before the final project was due. The group project took place over most of the semester and was worth 20% of the course grade. The project involved several sequential tasks: the proposal; data collection, analysis and visualization; a mock news report on another group's project; a critique of yet another group's mock news report, and an oral presentation. All group assignments, including the project, were submitted by posting to their group wiki on Blackboard. Throughout the semester, students submitted self/peer evaluations for each group assignment, including the project.

To assess collaboration, I used the group project (in particular, the data collection, analysis and visualization, which formed the core substance of the project), and the self/peer evaluation for the group project.

4. Goal 4: Problem solving — the process of designing and evaluating strategies to answer open-ended questions or achieve desired goals.

Measure(s) for Goal 4:

To assess problem solving, I again used the group project. I also used the project proposal in particular, since this was the "problem statement." A third component was included to draw upon individual work, since I didn't want this score to be entirely from group work. For this I used an end-of-the-semester essay. This essay was designed to measure integration, but was relevant for problem solving too. The directions appear below, in italics.

Purpose and task: One of the required components of STA 340 is the skill of integration. Integration is defined as the process of synthesizing and applying existing knowledge, past experiences, and other perspectives to new, complex situations. The objectives that comprise this skill are that you will:
•Draw conclusions from examples, facts, and/or theories from more than one field of study or perspective
•Adapt and apply skills, abilities, theories, or methods to explore complex issues in original ways
•Effectively communicate synthesized knowledge in ways that are inclusive of diverse audiences and perspectives
•Demonstrate self-reflection, building on prior experiences and responding to new and challenging contexts presented in the course

In this assignment, you will read about a recent study as portrayed in a news story, and you will also read the associated original source (journal article). Your task is to integrate these two

points of view (the journalist and researcher) with your own, drawing on your major and/or minor. As you summarize the study and news story, compare and contrast the two, and reflect on this from your own standpoint. Use the above information about integration as a guide. I expect your report to be in the neighborhood of 1000 words.

Here are your options. You can use a study & associated story about coffee and suicide, walking & creative thinking, or find your own. Note that the first "news story" about the walking & creative thinking study is from the same institution as the research (Stanford), so take that as you will. If you like, you could also compare the Stanford story to the Medical News Today story (they looked pretty similar to me…) If you decide to find your own study & associated story, please run it by me before writing your report.

Coffee and suicide news story:
http://www.inquisitr.com/870682/drinking-coffee-halves-suicide-risk-study-suggests/
Coffee and suicide journal article:
http://informahealthcare.com/doi/pdf/10.3109/15622975.2013.795243

Walking & creative thinking news story:
http://news.stanford.edu/news/2014/april/walking-vs-sitting-042414.html and/or
http://www.medicalnewstoday.com/articles/276035.php
Walking & creative thinking journal article:
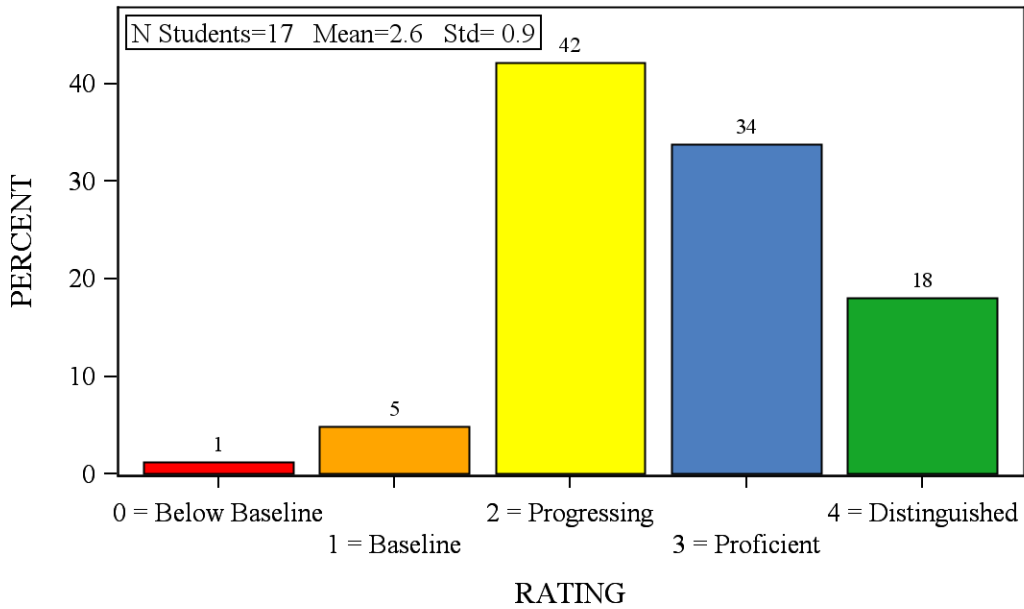*http://www.apa.org/pubs/journals/releases/xlm-a0036577.pdf*

5. Goal 5: Integration — the process of synthesizing and applying existing knowledge, past experiences, and other perspectives to new, complex situations.
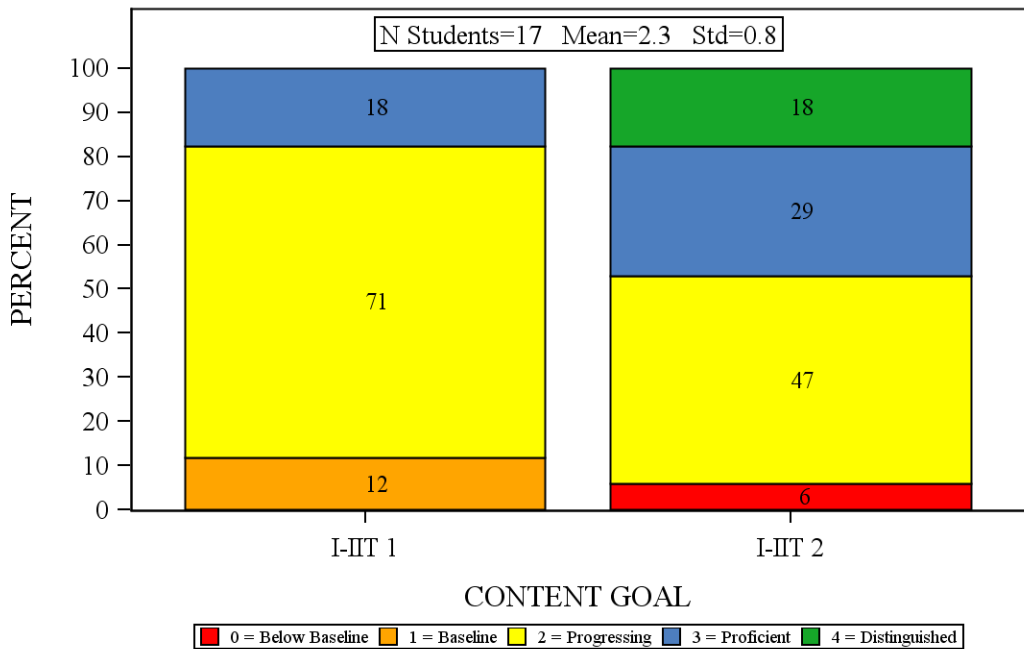
   Measure(s) for Goal 5:

To assess collaboration, I used the essay described above under problem solving.

D. RESULTS

GENERAL EDUCATION PROGRAM
Student Performance for 'STA 340-01'
### All Skill and Content Goals
Winter 2015

N Students=17   Mean=2.6   Std= 0.9

PERCENT

Rating	Percent
0 = Below Baseline	1
1 = Baseline	5
2 = Progressing	42
3 = Proficient	34
4 = Distinguished	18

RATING

0 = Below Baseline   1 = Baseline   2 = Progressing   3 = Proficient   4 = Distinguished

GENERAL EDUCATION PROGRAM
Student Performance on Content Goals for 'STA 340-01'
Winter 2015

N Students=17   Mean=2.3   Std=0.8

PERCENT

Content Goal	I-IIT 1	I-IIT 2
4 = Distinguished		18
3 = Proficient	18	29
2 = Progressing	71	47
1 = Baseline	12	
0 = Below Baseline		6

CONTENT GOAL

0 = Below Baseline   1 = Baseline   2 = Progressing   3 = Proficient   4 = Distinguished

Code	Sub Goal Description
I-IIT 1	How the course relates to information, innovation, and technology
I-IIT 2	How complementary and competing perspectives covered in the course contribute to the ongoing discussion about information, innovation, and technology

GENERAL EDUCATION PROGRAM
Student Performance on Skill Goals for 'STA 340-01'
Winter 2015

N Students=17   Mean=2.9   Std=0.8

1 = Baseline	2 = Progressing	3 = Proficient	4 = Distinguished

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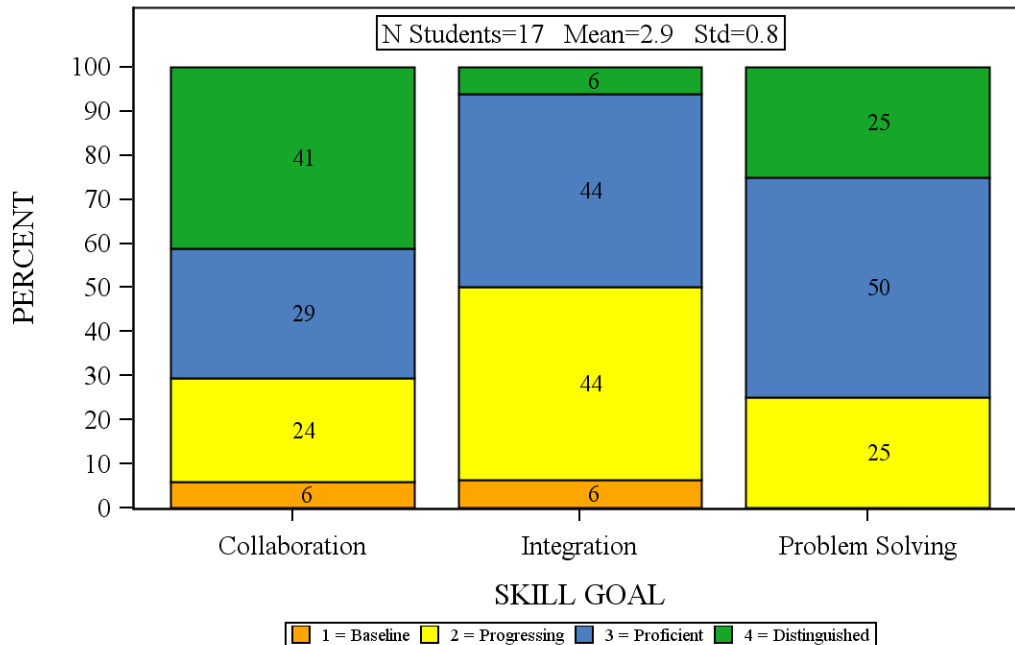
E. FINDINGS

9.   Based on the Tables and Figures, what conclusions do you draw?

For content goal 1, while I can argue that they are all drawn from the media and therefore are germane to information, innovation and technology (mostly information), I fear that the exam questions were simply testing students on their statistical knowledge and reasoning. Therefore, these scores mostly reflect the students' statistical skills, which they mostly came into STA 340 with.

This isn't as much the case for content goal 2. Here, the students' ability to write played a bigger role, and while I hope I helped them improve their writing skills this semester, I can't take full credit. I think the exam questions chosen here did a better job actually assessing this goal. As such, I'm pleased with the distribution of scores. (The one student who scored below baseline had poor attendance and generally submitted poor work.)

Most of the student groups worked very well together; I could see this both in their output and read it in their self/peer evaluations. Some did not, and the group work reflected this. There was only one "dysfunctional" group that submitted quality work (one strong student pulled the weight of the other two).

I am happy to see the scores for integration; I hope I am not being overly optimistic to think that the essay assigned near the end of the semester was an ideal way to capture the skills obtained in STA 340.

The scores for problem solving might be a bit rosy; they are based primarily on group work, so a few students got an unfair boost. I need to identify a better assessment for this before I teach STA 340 again.

10. Are there any contextual factors affecting these results that you would like us to know?

Naturally, I want to stress that this was my first time teaching the course! I had a great deal of enthusiasm, but no prior experience to draw on. Regarding the students, I'll say that they were mostly strong writers, sharp thinkers, good speakers, and seemed to have enrolled in the course for all the "right" reasons. This obviously helped keep lectures lively, ensured quality group work, and made grading a rewarding experience. That being said, a few students were very weak, and this had the greatest negative impact on the group work. Most groups worked very well together, but a couple did not.

Regarding the 7 students who scored in the distinguished category for collaboration, this boiled down to three groups. I was blown away by the quality of these three group projects. Two of these groups fired on all cylinders, with all three students pulling their weight. The third was lopsided, with one student doing all the work.

F. FUTURE ACTIONS

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11. Based on the results, describe any changes you anticipate making in <u>teaching</u> the course.

I plan to give short reviews of certain statistical concepts instead of expecting students to retain what they learned in STA 215 as much as I did. This way, I should have a better time extending these skills into new areas. This should help regarding the two content goals.

I am fairly happy with how I taught collaboration and integration. For problem solving, I need to do better. The statistics reviews should help here; after these, I can demonstrate problem solving for some more involved scenarios.

12. Based on the results, describe any changes you anticipate making in <u>assessing</u> the course.

As stated above, I need to find a better assessment for problem solving, and perhaps a better assessment for content goal #1.

13. What else can the GE Program do to help you meaningfully assess student learning?

The GE Program is doing a fine job!

G. INVOLVING THE STAKEHOLDERS

14. To what extent did the department/unit as a whole (or a subgroup) engage in this assessment process?

Not at all; it was a solo venture. Of course, if and when anyone asks, I will talk their ears off about STA 340. As soon as I get ready to hand the teaching reigns over to a colleague, I will include this report in the supporting materials, and will gladly assist them if they are asked to assess STA 340.

SUBMIT YOUR REPORT

Updated 1/13/15