How do we know if course changes are effective? Student survey data used to inform course design

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OVERVIEW

Curricular change, whether done out of choice or necessity, has the potential to alter learning outcomes. This presentation showcases two examples of how student survey data can provide for ongoing evidence-based change in course design.

DISCUSSION

In Professional Development III, an unstated goal is to positively impact students' community engagement attitudes. In 2010, reflective/journaling assignments were reduced in response to student feedback. Following this course change, positive response trends to community-related survey statements were decreased. Faculty often feel pressured to accommodate student likes/dislikes. In this case, the survey provides evidence for the positive effects of the original reflective assignments in 2009.

In Veterinary Gross Anatomy, survey data provided some unexpected course- and grade-related information. In this case, the data, although intended to create a baseline, provide insight into potential directions of change to this course.

In both examples, findings indicate a need for reevaluation of current course design. Survey evidence may direct curricular decisions, as in Professional Development III, or lead one to speculate as to why shifts in certain attitudes have occurred over the semester, i.e., pointing you toward the need for more inquiry. This speaks to the iterative nature of course redesign.

CONCLUSION

Ideally: Measure your learning outcomes before, during, and after you make any significant course change. What you learn provides an opportunity to reflect on what you are doing and pinpoint areas for further investigation.

References

Rockquemore KA, Schaffer RH. Toward a theory of engagement: A cognitive mapping of service-learning experiences *in* Introduction to service-learning toolkit. 2nd ed. Providence, RI: Campus Compact; 2003.
Cooper MM, Sandi-Urena S. Design and validation of an instrument to assess metacognitive skillfulness in chemistry problem solving. J Chem Eng. 2009; 86:240-245.

Example 1: *Surveys used to monitor course change effects*

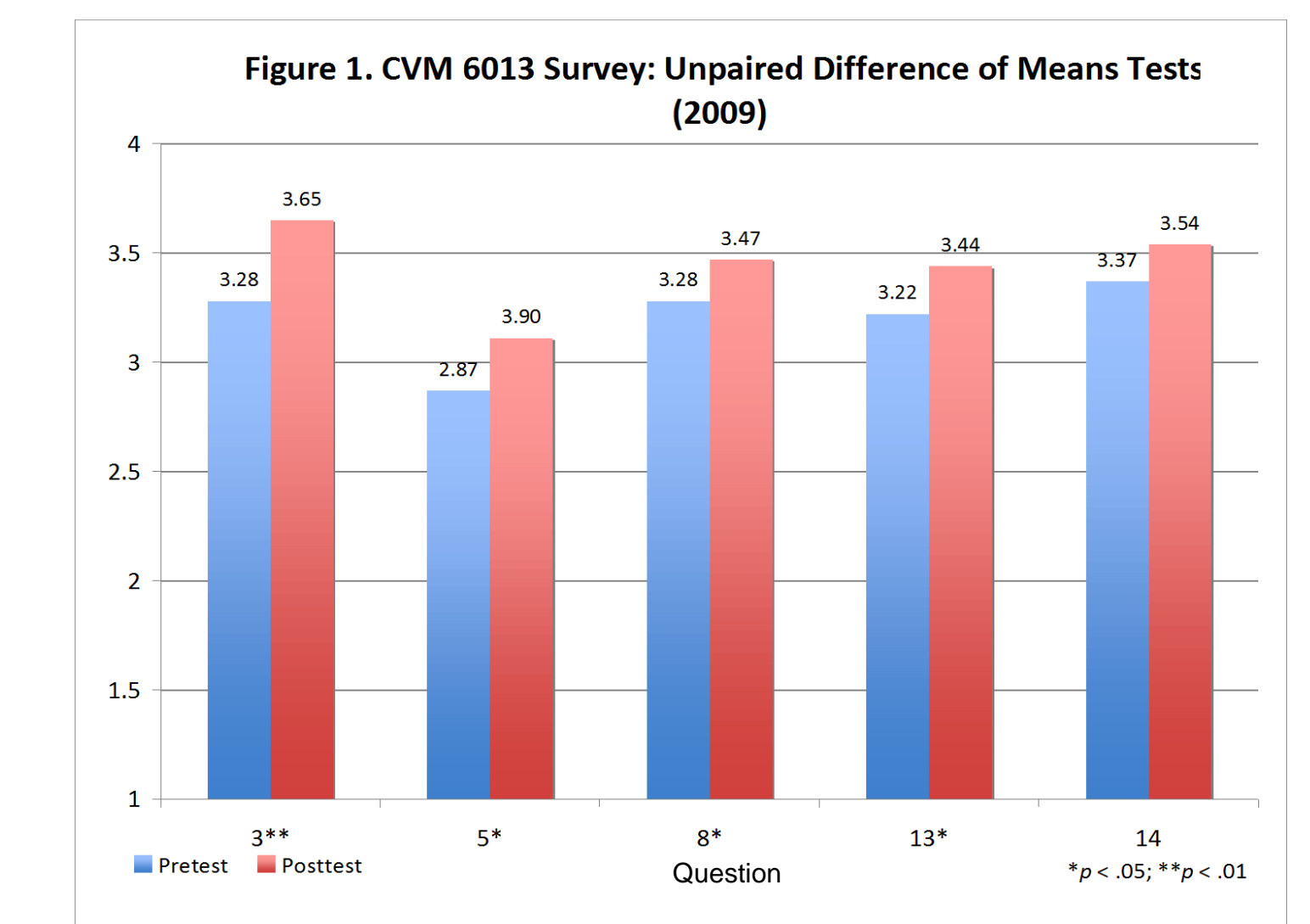**Professional Development III (CVM 6013)**

A year 2 communication course within the veterinary curriculum comprising interactive, hands-on - simulated and community-based - activities.

Pre- and post-course surveys were collected in 2009 and 2010. In 2010 there was a reduction in reflective/journaling assignments in response to student feedback. I was interested in uncovering effects this course change might have on student-community perceptions - an unstated goal within this course.
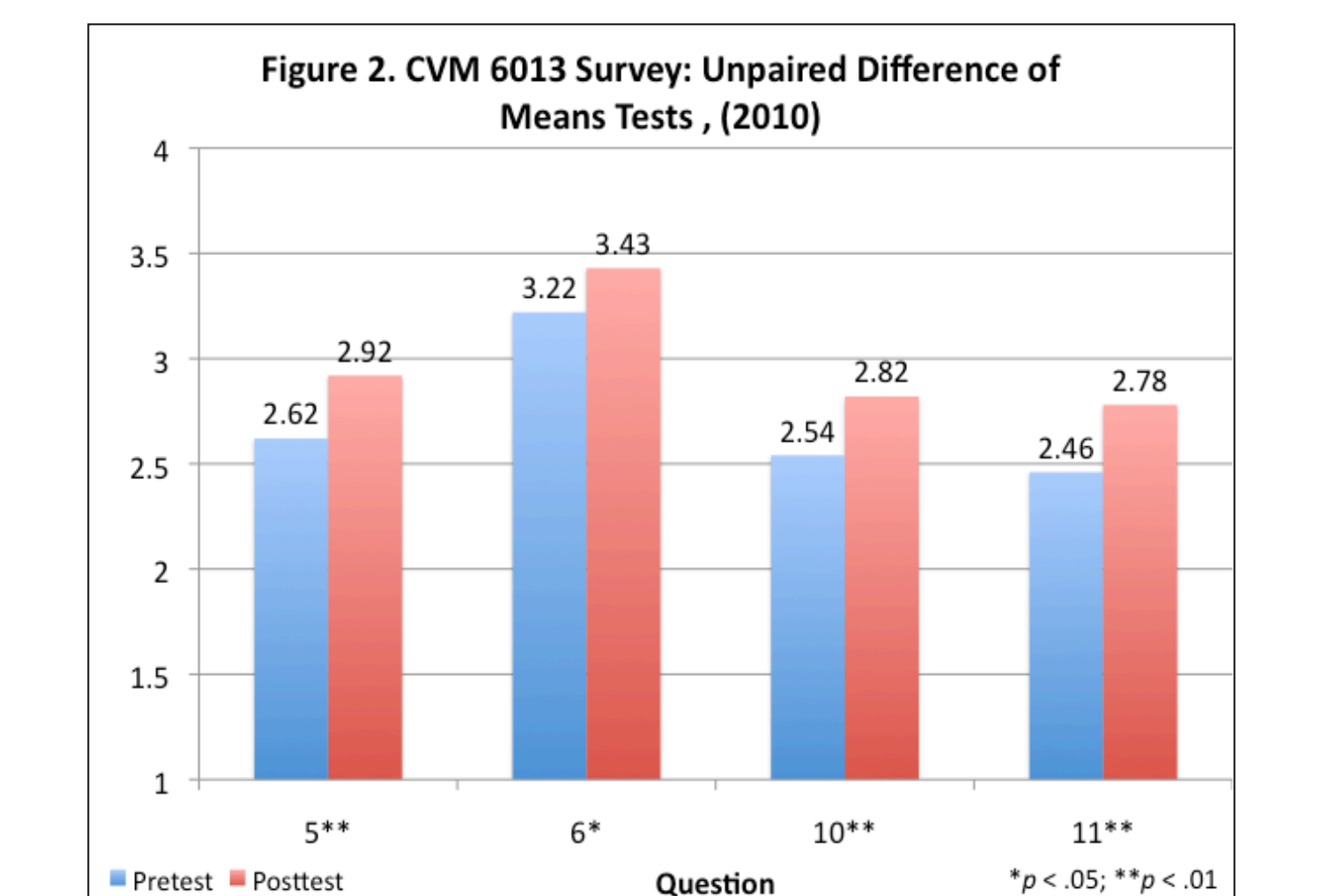
Survey objective: Did the 2010 course change affect student responses to community related questions?

Table 1. CVM 6013 – Community Related Statements

3. I feel that I can make a difference in the world.
5. I am an active member of my community.
6. It is important that I work for equal opportunity for all people.
8. I think that people should find time to contribute to their community.
10. I have a good understanding of the needs and concerns of the community in which I live.
11. I have a good understanding of the strengths and resources of the community in which I live.
13. Being involved in a program to improve my community is important to me.
14. I feel I can have a positive impact on the community in which I live.

Example 1 findings: Survey data suggest that the reduction in reflective assignments in 2010 led to fewer positive changes in student attitudes toward community engagement, indicating that this change was not in their best interests.

Figure 1. CVM 6013 Survey: Unpaired Difference of Means Tests (2009)

NOTE: Responses to items are on a four-point Likert scale of agreement ranging from Strongly Agree (4) to Strongly Disagree (1).

Figure 2. CVM 6013 Survey: Unpaired Difference of Means Tests , (2010)

NOTE: Responses to items are on a four-point Likert scale of agreement ranging from Strongly Agree (4) to Strongly Disagree (1).

Example 2: *Baseline surveys provide insight and indicate need for more inquiry*

Veterinary Gross Anatomy (CVM 6100)

A Year 1 course, designed to impart critical anatomical knowledge needed to understand other core and clinical courses.

Surveys were given at beginning, middle, and end of the course.

Survey objective: Baseline data collection in preparation for future course changes.

Table 2. Selected CVM 6100 Items of interest: Paired Difference of Means Tests (Fall 2010)

Variable	Pretest	Posttest	t
1. I usually prepare ahead of time for the day's dissection.	4.06 (0.09)	3.07 (0.12)	7.86****
5. I think I must retain my anatomical knowledge to do well in surgery.	4.69 (0.05)	4.36 (0.07)	4.05***
6. The gross anatomy lab is a good learning environment.	4.18 (0.08)	3.82 (0.09)	3.76***
7. The process of dissection is time consuming and of little value.	1.46 (0.07)	1.90 (0.10)	4.29****
9. Anatomy is relevant mainly to performing surgery.	4.80 (0.05)	4.68 (0.06)	2.29*
10. Pre-lab presentations help prepare me for the day's dissection.	4.36 (0.09)	3.50 (0.13)	6.44****
23. When I learn new material, I prefer to learn details first, then the "big picture."	2.86 (0.13)	2.63 (0.11)	2.22*
27. I learn best when I can do the dissection myself.	3.70 (0.10)	3.23 (0.11)	3.50***
29. I have good retention of material I have been told (e.g. lectures).	3.37 (0.10)	3.13 (0.10)	2.51*

NOTE: Cell entries are means with standard errors in parentheses; *p < .05; ***p < .001; ****p < .0001
Surveys: Pretest = beginning and posttest = end; Responses are on a five-point Likert scale, Strongly Agree (5) to Strongly Disagree (1)

Table 2 findings: Analysis of baseline data shows some responses shifting in an undesired direction; this information can be used to change the course for the better. In addition, three of these items (9, 23, and 27) predict grades significantly.
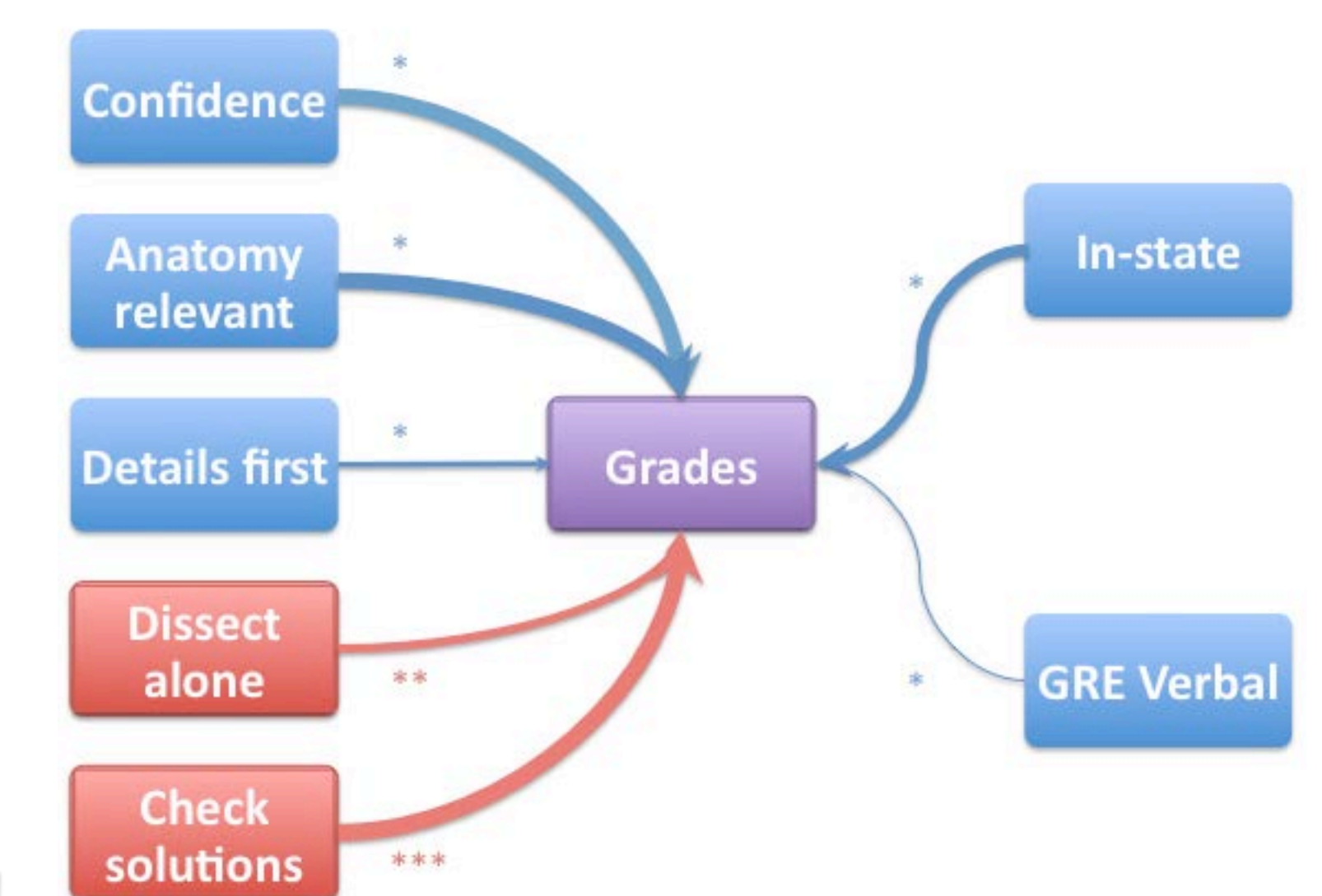
Grade Predictors:

Table 3. CVM 6100: Survey Items Serving as Determinants of Grade

4. I am confident in my abilities to learn anatomy.
9. Anatomy is relevant mainly to performing surgery.
23. When I learn new material, I prefer to learn details first, then the "big picture."
27. I learn best when I can do the dissection myself.
44. I make sure that my solution actually answers the questions.

Table 4. OLS Regression of Predictors of Student Grades in CVM 6100

Variable	Model 1	Model 2
Q4: Confidence (Midterm)	4.10*** (1.08)	3.69* (1.16)
Q9: Anatomy relevant (Beginning)	5.13** (1.48)	3.79* (1.60)
Q23: Details first (Midterm)	1.46* (0.58)	1.25* (0.57)
Q27: Dissect alone (Midterm)	-1.68** (0.56)	-1.97** (0.58)
Q44: Check solutions (Beginning)	-4.67*** (1.04)	-4.00*** (1.03)
In-state residency		2.77* (1.23)
GRE Verbal Score		0.01* (0.01)
Constant	67.68*** (8.46)	65.34*** (9.70)
N	80	72
F	12.79****	9.33****
R-squared	0.46	0.51

NOTE: Cell entries are unstandardized OLS regression coefficients with standard errors in parentheses.
*p < .05; **p < .01; ***p < .001; ****p < .0001;

Figure 3. Diagram of Model 2
OLS Regression of Predictors of Student Grades in CVM 6100

In Table 4, two models are presented: Model 1 has no demographic controls; it demonstrates the power of the survey data in predicting grades. **Model 2 adds demographic controls** and, although the two additional items are significant, not much more is added in terms of predictive ability (R-squared).