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**QR NICE**

My class is a 300-level PSY class (PSY317 – Sensation and Perception) in which students get introduced to primary research articles. My QR goal is for students to learn how to evaluate and interpret graphical representations of data obtained in research studies. The article I will use for the assignment is attached. Psychology students encounter graphical representations of data in practically all classes and being able to interpret the graph, and what it is telling us, is key to understanding research. In PSY317, we often discuss research studies that have helped demonstrate certain concepts. When this happens during lecture, I use graphical representations of the data to explain and discuss the study. Therefore, this exercise will help students learn techniques that will help them develop a skill that is imperative to understanding psychological research.

Revised Goals

1) Knowledge and Conceptual Understanding

Goal 1: Students will summarize the information conveyed in graphical representations of data. Students should particularly note variables measured and axes labels, and explain what each graph is saying.

2) Thinking and Other Skills

Goal 2: Students will analyze graphs in order to evaluate whether and how each graph’s findings support or refute the authors’ hypothesis. As such, students will judge the validity of the authors’ conclusions based on the data represented.

3) Attitudes, Values, Dispositions and Habits of Mind

Goal 3: Students will consider how their conclusions might have changed had the graphs depicted different data (I will provide possible scenarios) – so that students can employ their analysis skills more flexibly and gain confidence in their critical thinking skills. Moreover, students will develop confidence in their interpretations of graphical representations.

QR lesson

The QR lesson I developed focused on a primary research article that students read before coming to class on the day of the lesson. I briefly discussed the article during the preceding class, and this was the second time an assignment involved a primary research article during the semester. As such, it was not students’ first exposure to such an article.

The QR lesson involved a series of specific questions about the article. Students worked in groups of four, to complete the lesson in class. The first few questions asked students to identify the purpose and hypotheses of the article, the various dependent variables being measured and asked them to explain how and why each variable was measured. The students were then asked to orient themselves to three graphs used in the article, noting the axes, what was measured and what a high score on each of the y-scales would indicate.

In the second part of the lesson, students were asked to summarize the results of each of the three graphs and indicate whether these results directly assessed the authors’ hypotheses. If so, students were asked whether the results supported or refuted the hypotheses.

In the last part of the lesson, in order to encourage flexibility, I showed students slides demonstrating alternate results (one alternative for each of the three graphs). For each slide, groups were asked to summarize the alternate findings and determine if the alternative results would support or refute the authors’ hypotheses.

QR Assessment

For the QR assessment tool, I developed two similar multiple choice questionnaires, which were used in a pre-test, post-test manner. Each questionnaire asked students to interpret the findings of an accuracy graph and a reaction time graph, to indicate whether the results would support or refute a stated hypothesis, and to indicate their level of certainty in their responses. Each multiple choice questionnaire, then, had two questions assessing Goal 1(summarizing information presented in graphical form), two questions assessing Goal 2 (evaluating hypotheses using the graphs) and two questions assessing their perceived confidence in interpreting graphical representations (Goal 3).

Summary of Results

In analyzing the assessment results, I had a group of 19 students who signed informed consent forms. As such, my analyses refer to a sample size of 19 students.

To assess Goal 1, I performed a repeated-measures t test for the sum of the two scores that required summarizing information before the lesson (pre questionnaire) and after the lesson (post questionnaire). The results indicated that scores were actually higher on the questionnaire administered before the lesson, though not quite significantly, *t*(18) = 2.082, *p* = 0.052.

To assess Goal 2, I performed a repeated-measures t test for the sum of the two scores that required evaluating hypotheses before the lesson (pre questionnaire) and after the lesson (post questionnaire). The results indicated that scores were higher on the questionnaire administered after the lesson, but this was not a significant result, *t*(18) = -1.837, *p* = 0.083.

To assess Goal 3, I performed a chi-square independence test to see if confidence response was related to the time the questionnaire was administered (pre vs post). There was no significant relationship between the two variables for either accuracy or reaction time. Due to low power, I collapsed the confidence groups from 5 into 3 groups (confident, neutral, not confidence), to see if any relationship would emerge, and it did not.

Reflections

I think the assessment instrument was adequate, but the lesson itself needs more scaffolding. Student response was positive, and though the results don’t show improvement, many students told me that they could tell what I was hoping to do with the lesson, and that, correspondingly, they could see what the assessment was measuring.

I think the materials I developed are useful and could be effective, given two changes in the future. First, I might try to pick an easier article to understand, or perhaps use the lesson twice in a semester with articles of increasing difficulty. We had an unfortunate time constraint in my PSY317 class this semester because of two snow days. As such, we spent less class time looking at articles overall and did not get the chance to scaffold article work as I would want to do. In the future, I would like to expose my students to more primary research articles before using my QR lesson. Ideally, each exposure would be targeted to build the comprehension skills needed to do the QR lesson. Therefore, scaffolding and/or an easier article seems like the first major change I will need to implement in future semesters.

Second, I think it will be more effective to break down the article into two sessions and to, therefore, break the lesson into two sessions as well. In the first part, it would be ideal to discuss the purpose, hypotheses and methods, to make sure everyone is clear on what is being measured and why. Many of the errors I noted on the lesson stemmed from incorrect interpretations early on. As such, it is imperative to make sure everyone understands these basic premises before asking them to interpret graphical representations that depend on their early understanding of the article. Without understanding its purpose, hypotheses and variables, it’s impossible for students to interpret the graphs. So, next time around, I will break up the lesson in such a way as to emphasize that first part, give feedback, and only then continue to the interpretations of graphical representations.