

Teaching Quantitative Methods Vignettes

# Introducing the Teaching Quantitative Methods Vignettes (TQMV)

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**Abstract** ■ This is not a secret that courses in quantitative methods are unpopular in Colleges and Universities. However, an enlighten citizen knows that understanding statistics is important to develop critical thinking in this era of fake news. The Teaching Quantitative Methods Vignettes (TQMV) is a new category of articles that publishes teaching activities in quantitative methods for students in social sciences, humanities and health sciences. The goal of these vignettes is to improve the teaching of statistics and help instructors to have access to a large pool of good pedagogical activities in open access.

**Keywords** ■ Teaching statistics; Pedagogical activities; Learning.

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*Editorial launching the vignettes.*

## Introduction

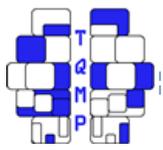
How can we play with randomness in class? How can students improve a *chartjunk*? Will it improve their understanding of what a good representation of data is? Is there an ideal strategy to exemplify ANOVA? What is a good activity to illustrate the impact of outliers on regression? How can we teach clearly the relation underlying ANOVA and linear regression? What is the best way to teach hypothesis testing? Should we teach statistics without *p*-values? If yes, how? How can we exemplify the idea of invariance in a Rasch model?

Many instructors face such questions when preparing their lessons because they want to improve their teaching and the way they supervise students. In order to help them, *The Quantitative Methods for Psychology* has created a new category of articles named *Teaching Quantitative Methods Vignettes*. With these articles, we want to disseminate teaching activities that can help students at a post-secondary level in social sciences, humanities and health sciences.

## Why is it important to care about teaching of quantitative methods?

Statistics are provided almost every time you consult the website of a newspaper, during a documentary or in an interview from a popular podcast. The reason is simple: numeric information help understand the world which, in turn, is a fundamental aspect of social responsibility. However, many of us have a difficult relation with statistics. We are, in fact, a very bad *Homo statisticus* (Kahneman, 2011). Several authors documented the frequent misconceptions students have about probabilities (e.g., the famous Monty Hall problem where a luxury car is hidden behind a door and goats behind two other doors or, more recently, the *p* value misconceptions (Haller & Krauss, 2002).

This is not a secret that courses in quantitative methods are not popular among students in psychology, education, sociology and social sciences more generally (Cui, Zhang, Guan, Zhao, & Si, 2019). Many have experienced difficulties and unpleasant feelings in their mathematics courses (Paechter, Macher, Martskvishvili, Wimmer, & Papousek, 2017). We also know that quantitative methods courses generate more anxiety than other courses (Baloglu, 2003). This anxiety is sometimes expressed as a reaction which hinders constructive learning (Onwuegbuzie & Da-



ley, 1999) in addition to generating negative feelings about this subject and its instructor (Onwuegbuzie & Seaman, 1995).

We agree with Sijtsma (2015) when he wrote: “teaching researchers [and students] more statistics provides them with more experience and trains them to react intuitively relying on experience rather than on heuristics” (p. 9). But there are additional benefits: first, teaching statistics using hands-on activities is a good way to help people understand (and appreciate) statistics, reducing anxiety and negative perception; second, it will also improve how we teach this important subject by grounding it in applied situations (American Statistical Association et al., 2005).

A few academic journals already publish articles about good activity to teach quantitative methods (e.g., *Journal of Statistics Education*, *Teaching Statistics*, *The American Statistician*) but they often have more diverse objectives. In particular, they don’t specifically focus on undergraduate and graduate social science students who have generally a lower understanding of random process and how to use mathematics to understand these processes. By contrast, these vignettes have one specific target population, the social sciences university students, and one specific objective: providing learning activities. The journal will also publish reviews, evaluations and empirical studies bearing of those vignettes.

The activities can be anything, from demonstrations by the instructors to field study in the outside. They can be based on self-collected data, fictitious data, computer-generated data, or publicly available small or large datasets. They may require computers, hand calculators or eye-ball estimations.

### The structure of a vignette

We believe there are many ways to write an article that illustrate a good teaching activity in quantitative methods. In any case, the reader needs all the information to operationalise properly a promising pedagogical strategy. Here is the possible structure of a vignette:

1. Introduction where the concept to teach is presented with some theory about this concept ;
2. The description of the activity with at least one example;
3. A strategy to assess the activity;
4. A conclusion with open questions about the activity.

Of course, other sections can be included in the article. For example, follow-up activities or alternate data sets suitable for the activity. Whenever computer software is used, programming code or script used during the activity should be provided.

These vignettes will also be identified with additional metadata so that a search can more rapidly find an appropriate

vignette for one’s setting. Example of metadata are concept illustrated, prerequisite, duration of activity, type of activity and suitable for class size (small, medium and large).

Finally, we strongly encourage authors to format their article concisely (maximum 2000 words excluding references, figures, tables and appendix).

### Review criteria

The editor only accepts manuscripts in plain English. Every proposition will be reviewed using an open peer-review process using the following criteria:

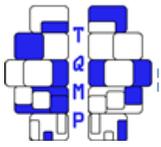
1. Relevance for Teaching Quantitative Methods;
2. Quality of the content;
3. Feasibility of the activity;
4. Outcomes of the activity;
5. Quality of the overall presentation (manuscript clearly written and logically organized, appropriate quality of English language) and presence of supporting material when needed.

### Teaching for learning!

The main goal of TQMV is to improve the teaching of statistics and help instructors to have access to a large pool of open access pedagogical activities. We also encourage the community to study the quality of a vignette and submit manuscripts containing an empirical study regarding the vignettes. Finally, our long-term expectation is to create a collaborative and organized website where the open access vignettes can also be open-peer reviewed.

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