# Introduction

## Rationale

Technological advancement has led to the emergence of big data (Gould & Çetinkaya-Rundel, 2014) making data inevitable in our daily life. In addition, powerful computers are now easily available . These developments gave way to the emergence of data science as a field. As a result, the practice of statistics has dramatically changed and has distanced away from statistics education (Finzer, 2013; Wood, Mocko, Everson, Horton, & Velleman, 2018; Zeiffler, Garfield, & Fry, 2018). In this regard, Gould (2010), Horton et al. (2015), Horton (2015) and Hardin et al. (2015) pointed out the importance of data management skills and its integration in introductory and second courses in statistics. Nonetheless, some measures are already in place to lessen the gap between statistical practice and statistics education. In 2005, Franklin et al. (2007) put forth the Guidelines for Assessment and Instruction in Statistics Education (GAISE) Report recommending a framework for statistics education both in the k to 12 and college level. In 2016, the GAISE College Report ASA Revision Committee (2016) revisited the effectiveness of the framework and still found it effective. The framework is now the standard in statistics education in the United States and in many countries who adopted it (Zeiffler et al., 2018).

In the GAISE report, one noteworthy recommendation is the “use of technology to explore concepts and analyze data.” Studies have shown that the use of technology can really improve statistics education; equipping learners with relevant data skills and effective powerful tools in this era where data is very much abundant (Chance, Ben-Zvi, Garfield, & Medina, 2007; Chance & Rossman, 2006; Çetinkaya-Rundel & Rundel, 2017; Doi, Potter, Wong, Alcaraz, & Chi, 2016; Harraway, 2012; Stander & Dalla Valle, 2017). However, there is no single statistical computing tool that fits all statistical tasks (McNamara, 2018). Nonetheless, introductory statistics students should be taught a common statistical package such as SPSS, SAS, or R (R Core Team, 2018), enthusing them to continuously learn statistics technology since statistical tools are diverse and eventually evolve through time (Gould et al., 2018).

In our country, I have observed that leading universities are aware of this issue and have already integrated the use of technology in their curriculum for statistics education. The University of the Philippines for example uses a number of software in its introductory statistics courses and statistics courses (eg. R with RStudio, Python, SAS, SPSS, Stata, MS Excel, QGIS, ArcGIS, Gephi, yEd Graph Editor, and more). Most of the software used are opensource.

In the province, some universities have acquired SPSS to teach statistics courses. On the other hand, some still uses calculators to do and teach statistical computing. Unfortunately, both setup do not lessen the gap between statistics education and statistical practice. In reality, most institutions to which graduates from these universities get employed cannot afford SPSS. One can choose MS Excel as an alternative, however its functions are limited.

x <- c(1,2,3,4,5)

the mean is 3.

Reproduciblequite

The gap between statistical practice and statistics education.

barriers in using technology (price)

R and RStudio

Efforts in the Philippines

## Statement of the Problem

## Statement of the Hypothesis

## Significance of the Study

## Research Framework

## Scope

## Definition of Terms

# Review of Related Literature and Studies

The choice of which software to use in teaching statistics can be quite a challenge given a lot of things to consider. It can be a problem similar to bridging the gap between the practice of statistics and statistics education. Tools for learning statistics can be used easily by starters opposite to when using tools for doing statistics (Gould et al., 2018). However,

# Methodology

## Research Design

## Research Environment

## Respondents

## Research Instruments

## Data Gathering Procedure

## Data Analysis

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