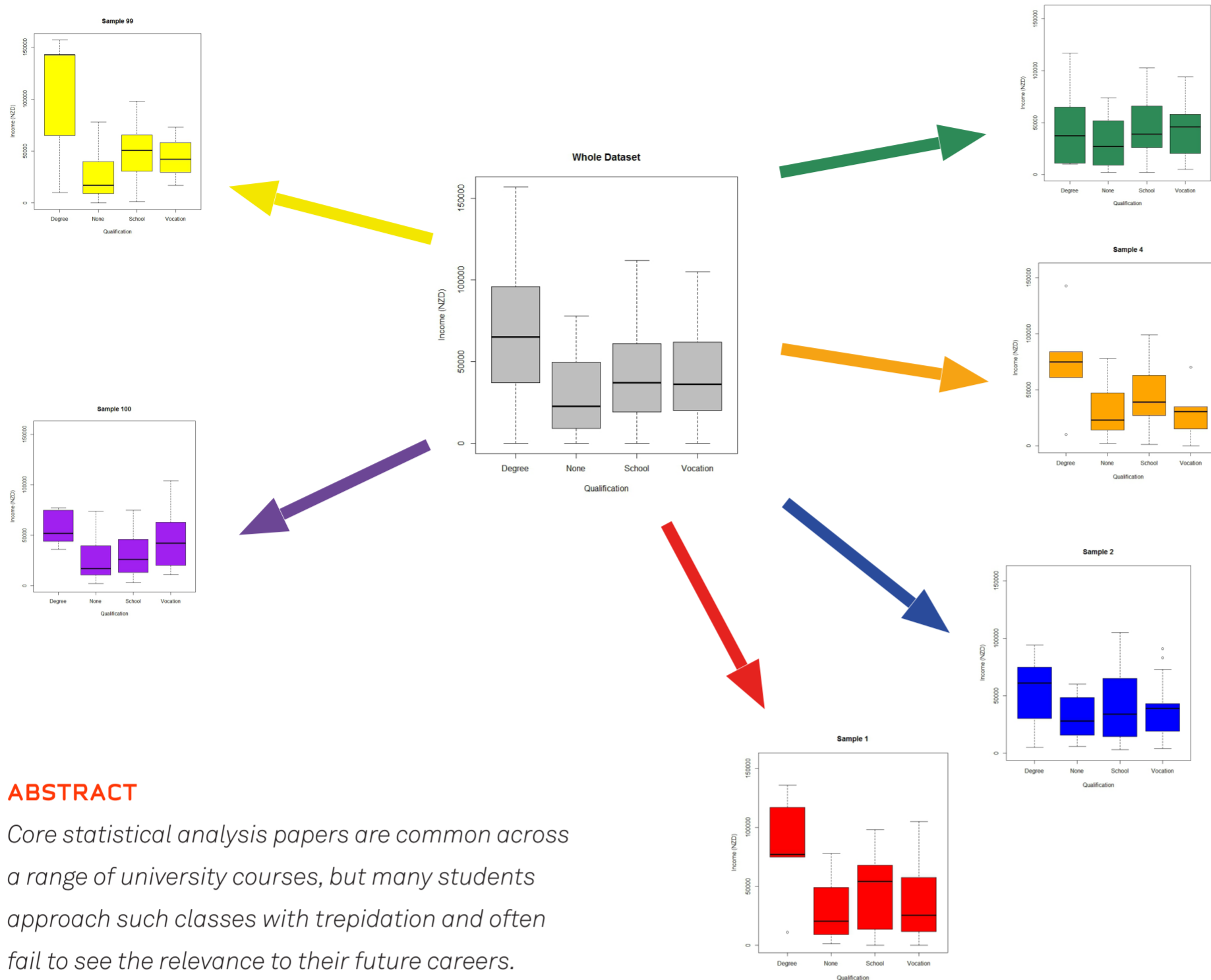


Effective Strategies for Teaching Statistics to Non-Specialists



ABSTRACT

Core statistical analysis papers are common across a range of university courses, but many students approach such classes with trepidation and often fail to see the relevance to their future careers. This project aimed to address this issue with the development of case-studies which lead the students through a statistical inquiry involving a subset of real-life data unique to each student.

Box and whisker graphs are used by students to analyse and compare data sets

AIMS

This project aimed to develop a series of digital case-studies and related learning resources for use within the teaching of core statistical analysis papers.

Previous assignments for such papers typically gave students little choice about the data they analysed, and resulted in all students submitting very similar work. This project attempted to address this by allowing the students to have some choice about the techniques they used and the variables they investigated (an approach known to have a positive effect on student learning) as they were analysing a unique sample of an assignment dataset.

The paper involved student use of the statistical software package R. The project developed an approach that used the software to randomly select a unique subset of data, with the selection process based on their student ID as a starting 'seed' for random selection. This ensured each student had a different sample for analysis, while also allowing the lecturer to regenerate the sample and confirm results (important from a marking perspective).

The case-study involved a combination of activities across the lectures, labs and assignment. This led to the development of a framework to guide the implementation of this type of learning activity within similar papers.



Murray Black and Sarah Marshall

"The project has allowed the development of a model for introducing and assessing case-study based learning activities in statistics courses."

OUTCOMES

Two case studies were developed as part of this project. These incorporated a number of different learning activities, in lectures, labs and as part of an assignment. The case study used in the Semester 2 Applied Statistics paper was based on household savings and income data from Statistics New Zealand.

Anecdotal feedback from the students was positive. In addition to giving the students' choice about which aspect of the dataset they investigated, the use of individual samples reduced concerns about plagiarism as every student submitted unique answers. However, as assignments are similar, they retain the mark-ability and are able to be used in peer discussions.

IMPLICATIONS

This project has demonstrated how the students can be set an individual, structured inquiry of a dataset as an assignment, based on interesting real data, while still addressing practical considerations of assessment scalability. The project has acted as a pilot study that has allowed the development of a model for introducing and assessing case-study based learning activities in statistics courses.

FUTURE DIRECTIONS

It is hoped that the second case study will be used in the next Applied Statistics cohort. It is proposed that one case study

LTDF

2014

LEARNING AND TEACHING DEVELOPMENT FUND

ENHANCEMENTS IN STEM TEACHING

PROJECT INFORMATION

PROJECT LEADER Sarah Marshall

PROJECT TEAM Murray Black
Sharlene Dohrman

CfLAT ADVISOR Peter Maclaren

OUTCOMES

- Exploration of available learning resources
- Development of R based case studies and associated learning materials
- Implementation of one of the case studies with Applied Statistics 715184

KEYWORDS

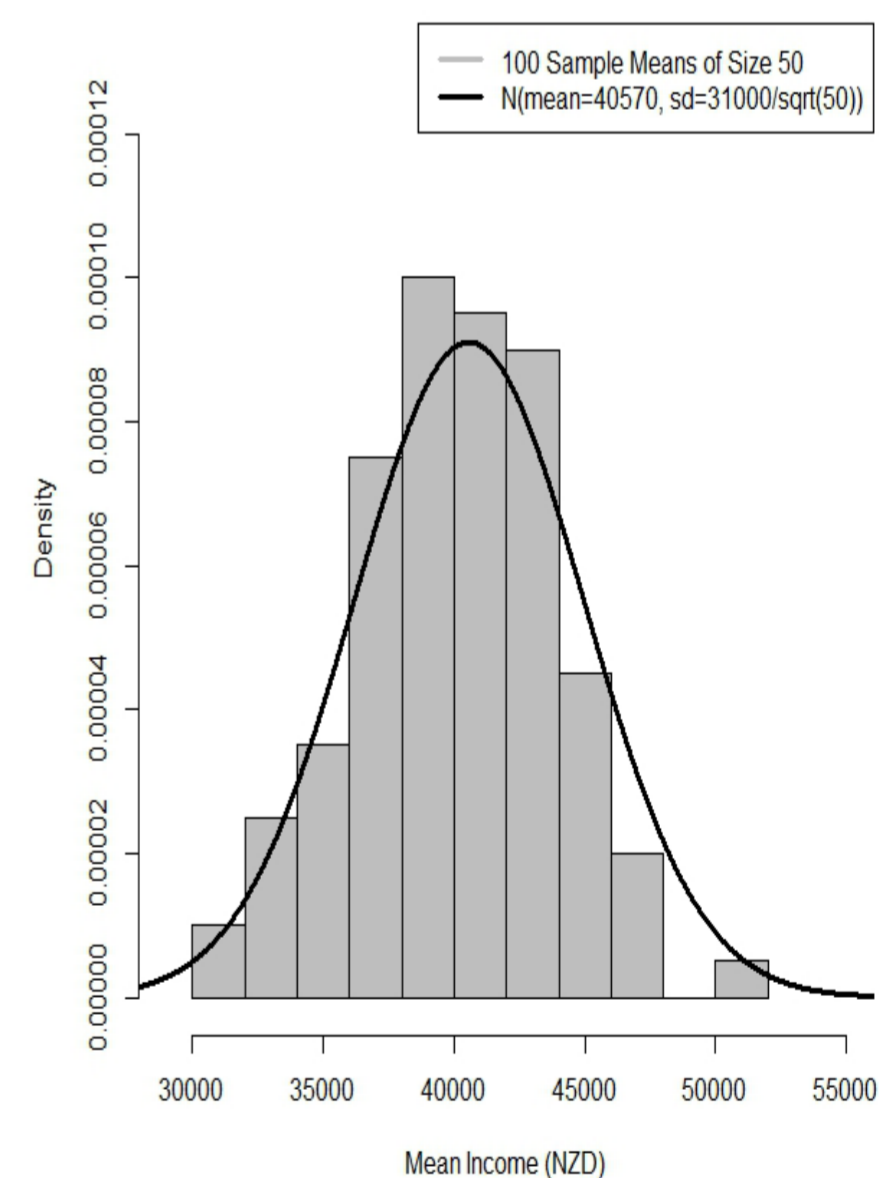
Statistics

Education

Case Studies

R

will be an assignment and the other will be a lab exercise. This may equip the students with a better understanding of what is expected in terms of discussing and interpreting results. Features of the model will be used as the basis for ongoing developments.



For more information contact Project Leader at sarah.marshall@aut.ac.nz

Scan the QR code to download the **ebook**