Preliminary Announcement

**The Tenth International Research Forum
on Statistical Reasoning, Thinking, and Literacy (SRTL-10)**

2-8 July 2017

The University of Auckland, New Zealand

Location: Sudima Hotel, Rotorua, New Zealand

Conference Theme:

Innovations in statistical modelling to connect data, chance and context

*Statisticians have a choice of whether to access their data
from the real world or from a model of the real world.*
(Graham, 2006, p. 204)

The SRTL-10 Forum will build on and expand the work discussed at previous SRTL gatherings and in particular the deliberations about statistical modelling in SRTL-9. Our previous work during the first SRTLs (1 to 4) has focused on reasoning about "big statistical ideas" such as data, variability, distribution (aggregate view of data) in the context of EDA. More recently, in SRTLs 5 to 8 we have introduced informal statistical inference, and studied it in the relation to the role of context, samples and sampling, and uncertainty.

Our discussions in SRTL-9 suggest that ideas, approaches and learning technology related to statistical models and modelling are relevant and important to further study in order to better integrate and extend our previous work and thinking and the statistics education discipline. Statistical modelling has been portrayed as a possible bridge between data and chance, statistics and probability, real world context and model, and formal and informal pedagogies. Furthermore, being immersed in modelling-based activities can help learners to develop their statistical reasoning about informal statistical inference (ISI), uncertainty, context, data and distribution, variability, the aggregate and more (Garfield & Ben-Zvi, 2008). Recent developments in technology (e.g., *TinkerPlots 2*) can support integrating exploratory data analysis approaches and probabilistic models, which allow for experimentation (e.g., improving models, simulations) and generation of data (e.g., drawing and studying random samples from a model) for learning informal inferential reasoning (IIR) (Konold, Harradine, & Kazak, 2007).

These exciting general developments and our SRTL-9 discussions provide a stimulus for growth in the rethinking and study of *innovations in statistical modelling to connect data, chance and context*. Studies can focus on learners' reasoning about statistical models and modelling, theoretical and pedagogical approaches to modelling to develop statistical reasoning, with a special interest in integrating data, chance and context through statistical models and modelling. This topic is relevant and important at all levels of schooling, even in the early years.

However, we are aware also that, "one of the most overworked words in statistics education and mathematics education is 'model'. Appearing in a variety of dissimilar contexts, its usage is at best unclear, and at worst, inappropriate" (Graham, 2006, p. 194). Therefore we exclude issues such as "mental models", and invite focused contributions that study one or more of the following themes *in relation to statistics education*:

- How do models and modelling fuse, integrate or distinguish the contextual and statistical worlds?

- What structural insights do models or modelling foster to link context and data? (e.g., comparing groups, repeated measures, trends, variability (signal/noise))

- What common and diverse theoretical perspectives are useful for progressing the field?

- How does reasoning about statistical models and modelling develop in the context of connecting data, chance and context?

- What are rudimentary ideas of statistical models and modelling and how are they expressed among young students?

- How are ideas related to statistical models and modelling understood and used by students in connecting data, chance and context? (e.g., What ideas are needed to understand and use models? What does it mean "to understand a model?" What are innovative tasks, tools, or sequences of instructional activities that may be used to help these ideas emerge?)

- How do students explore, construct or mend models at different ages?

- What are trade-offs in what models highlight and suppress?

- How can models and modelling promote generative thinking (e.g., 'what ifs')

- What qualities of discourse are promoted by a modelling environment and how does modelling promote qualities of discourse?

- What development supports teachers to adopt a modelling perspective of statistics?

- What similar and unique perspectives are needed for modelling in a big data or data science context?

- How do students reason with models and modelling in a "messy" context or ill-structured problem?

- What design considerations support teaching or learning with a modelling perspective?

- How do different purposes of models (generative, predictive, functional) extend reasoning and applications in different ways?

- How can technology help to develop students' reasoning about statistical models and modelling in the context of connecting data, chance and context?

- What are ways to assess reasoning about statistical models and modelling?

Expression of interest to attend the conference can be submitted before **September 1, 2016** to **srtl2017@gmail.com**. Participation in the SRTL Forum can be as a *presenter* or as a *discussant*.

Presenters are asked to send a brief letter of introduction of yourself and a two-page overview of the work relevant to the theme of the Forum, addressing: introduction, literature review and/or theoretical framework, methodology, expected results, and your practical and theoretical contribution to the theme.

Discussants are experienced SRTLers who will actively participate in all sessions and discussions and will have time to share their own reflections and comments in a panel on the concluding day. Discussants are asked to send a brief letter with a formal expression of interest.

SRTL-10 Local Organizers:

Maxine Pfannkuch (m.pfannkuch@auckland.ac.nz) and Stephanie Budgett (s.budgett@auckland.ac.nz) from The University of Auckland and Pip Arnold (PArnold@cognitioneducation.com) from Cognition Education Ltd.

SRTL-10 Location

Sudima Hotel, Rotorua, New Zealand

References

Graham, A. (2006). *Developing thinking in statistics*. London: Paul Chapman Publishing.

Garfield, J., & Ben-Zvi, D. (2008). Learning to reason about statistical models and modelling. In J. Garfield & D. Ben-Zvi, *Developing students' statistical reasoning: connecting research and teaching practice* (pp. 143-163). Springer.

Konold, C., Harradine, A., & Kazak, S. (2007). Understanding distributions by modelling them. *International Journal of Computers for Mathematical Learning*, *12*(3), 217-230.