

CHANGING PRIMARY SCIENCE EDUCATION BY IDENTIFYING, REPRESENTING, AND ANALYSING VARIATION IN DATA-BASED OBSERVATIONS FROM INTEGRATED STEM ACTIVITIES

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Making observations to describe natural phenomena is an emphasis of primary science education. In the early years of schooling, those observations are often qualitative and seldom used to make decisions. There is, however, the potential to add value to the established curriculum by providing young students the opportunity to record data-based observations as part of a science inquiry. Such an approach set within integrated STEM contexts supports students to gather empirical evidence from observation and experimentation.

This presentation will provide examples from a research project entitled, *Modelling with Data: Advancing STEM in the Primary Curriculum*, that illustrate the potential for learning about science topics explored through data-based inquiries to foster outcomes in the relevant STEM disciplines across the primary years of schooling. Science topics include the manufacture of machine-made versus hand-made products, the transfer of heat, the application of force, the dispersal of seeds, the viscosity of liquids, and the growth of plants (Fitzallen & Watson, 2020).

Common to all activities was the implementation of the Practice of Statistics (Watson et al., 2018) as the mathematics component of STEM, which involved a statistical inquiry cycle of:

- Formulate question/s,
- Collect data,
- Analyse data, and
- Interpret results (Franklin et al., 2007).

Embedded within the inquiry process was the gathering of variable data related to the questions posed, representation of data in ways that account for trends within the variability seen, and interpretation of the data that accounted for the variability seen. Also, central to many of the activities was student use of the exploratory data analysis software, *TinkerPlots*TM (Watson & Fitzallen, 2016), which served to scaffold student learning outcomes.

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