

The development of middle school children's interest in statistical literacy

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Certification of dissertation

I certify that the ideas, experimental work, results, analyses, software and conclusions reported in this dissertation are entirely my own effort, except where otherwise acknowledged. I also certify that the work is original and has not been previously submitted for any other award, except where otherwise acknowledged.

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Statement of ethical conduct

The research associated with this thesis abides by the international and Australian codes on human experimentation as set out in the “National Statement of Ethical Conduct in Human Research (2007)” and interpreted by the Human Research Ethics Committee of the University.

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Abstract

The focus of the study is interest and its influence as a motivating factor on adolescent children. Interest has a pivotal role in determining the extent to which students choose to re-engage in learning material. The dissertation describes the development of an instrument that is suitable for measuring middle school children's interest in statistical literacy, which is an ability to interpret messages containing statistical elements.

The "Statistical Literacy Interest Measure" (SLIM) is based on theoretical models that are embedded in the motivational literature. From these models, a bank of items was written, reviewed, and tested on a pilot sample of Australian middle school children. Testing and selection of items was undertaken using the Rasch Rating Scale Model (Andrich, 1978). Based on the outcomes of this process, further development of items occurred and they were subsequently retested on a larger sample of Australian middle school students. As a result of the process, 16 self-descriptions were deemed to be suitable for inclusion in the instrument.

Students' responses to SLIM and the "Self-Efficacy for Statistical Literacy" (SESL) scale, a measure of students' self-efficacy also developed in the study, were used to generate interest and self-efficacy logit scores. A number of statistical models were applied to these scores, as well as achievement and demographic data that were also collected during the study.

The results of the study indicate that interpretations based on SLIM will be valid. The measure explained approximately two thirds of the variance in students' responses and reported satisfactory reliability coefficients. The placement of items on the one interest continuum confirmed that there is a meaningful hierarchy associated with the interest construct, in that it commences with the low levels of interest that are associated with task-mastery and increases up to those high levels of interest that are associated with a desire

to re-engage with the domain.

The modelling process confirmed that in a middle school context, students' self-competency beliefs were a strong predictor of their interest but that interest itself was not a strong predictor of achievement. The inclusion of some teacher and school-related variables in the models suggested that teachers and schools have a greater influence on students' achievement than on their interest.

Given the increased emphasis that statistics education now appears to have in the proposed Australian curriculum, SLIM is a timely addition to the repertoires of researchers seeking to explore the development of middle school students' statistical literacy.

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