ZMATH 2014a.00785

Hannigan, Ailish; Gill, Olivia; Leavy, Aisling M.

An investigation of prospective secondary mathematics teachers' conceptual knowledge of and attitudes towards statistics.

J. Math. Teach. Educ. 16, No. 6, 427-449 (2013).

Summary: The development of statistical literacy is fast becoming the focus of a large part of mathematics instruction at primary, secondary and tertiary levels. This broadening of the mathematics curriculum to encompass a focus on statistics makes considerable demands on teachers. Most mathematics teachers acknowledge the practical importance of statistics and are willing to give more relevance to the teaching of statistics; however, many mathematics teachers do not consider themselves well prepared to teach statistics. The aims of this study were to investigate the conceptual understanding of statistics of prospective secondary mathematics teachers; the nature of their attitudes towards statistics and if there was a relationship between attitude towards statistics and conceptual understanding of statistics. Conceptual understanding was measured using a standard assessment instrument (comprehensive assessment of outcomes in a first statistics course) which allows comparison across other disciplines. Despite being very mathematically able and confident, the prospective mathematics teachers in this study do no better in the assessment than students from other (mostly non-quantitative) disciplines. This, perhaps, gives further evidence that statistical thinking is different from mathematical thinking and that a strong background in mathematics does not necessarily translate to statistical thinking. Conceptual knowledge was poor in some fundamental areas of statistics such as being able to properly describe the distribution of a quantitative variable and data production. The attitudes of these teachers towards statistics were measured using a widely used instrument (survey of attitudes towards statistics). The results indicate generally positive attitudes but an acknowledgement that statistics is not a subject quickly learned by everyone and requires discipline to learn. No strong correlation was found between attitudes and conceptual knowledge. It is recommended that in order to improve teacher knowledge, teacher education programmes must include tailored modules in statistics and highlight the differences between mathematical and statistical thinking.

Classification: K49 C29 C39
Keywords: teacher knowledge; affect; difficulty; value; interest; attitudes; statistics; conceptual understanding
doi:10.1007/s10857-013-9246-3