Mean, median, and mode in school years 4–6:
A study about aspects of statistical literacy
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Abstract

This thesis explores different aspects of statistical literacy such as mathematical knowledge, context knowledge, use of words, and conceptions. The focus is on measures of central tendency: mean, median, and mode, and school years 4–6 (ages 10–13). The thesis contains of five papers and the phenomenon is studied in different contexts. In the first three papers, data is generated through a questionnaire answered by prospective teachers, teachers, and students in grade 6. In papers 4–5, second hand data is generated through textbook analysis where all tasks about the measures in seven different textbook series were analysed.

Papers 1–3 showed that all respondent groups, primarily express procedural knowledge. They sometimes mix up the definitions of mean and median. Mean appears to be the most familiar measure and different contexts appropriate for mean are suggested. Median and mode appear to be less familiar, especially median which according to the students only exists in a school context. All respondent groups show several ways to express the mean using different colloquial connotations. Median and mode on the other hand do not bring any connotations, leading to difficulties to express explanations. For mode, some students used a homonym that gives a wrong meaning to the concept. This implies that the support for understanding mean, based on colloquial words, is not available for median or mode.

The results from paper 4 show a high proportion of procedural tasks dealing with above all quantitative values for mode. Only one textbook definition of mode exemplified with qualitative values. In paper 5, tasks were examined out of mathematical properties related to input object, transformation, and output object. Here, tasks about both mean, median, and mode were examined. The results show that the distribution of the tasks was skew, meaning that students have different opportunities to learn various mathematical properties of the three concepts, something that was even more complex given that in many tasks, the mathematical properties in focus were implicit.

Overall, statistical literacy according to the results generated in the five different studies, appear to be pre-dominantly about numbers and procedures. Very little attention seems to be on contextual knowledge, something that is crucial in statistical literacy.