STUDENTS' VIEWS RELATED TO CHANCE VARIABILITY

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THEORETICAL BACKGROUND AND RATIONALE OF THE STUDY

The understanding of statistical variation is a core idea for describing and assessing statistical literacy (Watson & Callingham, 2003; Kuntze, Lindmeier & Reiss, 2008). In these studies, dealing with variation has been in the focus of the development of competency models, which were evaluated successfully showing the one-dimensionality of the underlying competency constructs (Rasch model). The corresponding empirical studies were based on test instruments developed according to the competency models.

However, beyond pure abilities of dealing with statistical variation, there is probably a backing of these abilities in individual views/convictions about the roles of randomness and determinism. For example, Engel and Sedlmeier (2005) found that learners often hold strong determinist views that might constrict the development of a sufficient understanding of chance variability. These learners favoured regular, determinist patterns in distributions instead of more probable, less regular outcomes. If learners endorse such determinist views, it is very probable that they encounter difficulties when they have to construct mental models linked with statistical variation. Hence, views about chance variability should be considered as a potentially crucial influencing factor on statistical literacy. However, in many studies, views related to chance variability were examined based on mainly one task, in which learners were asked to draw a typical distribution of raindrops on a roof in the form of 16 squares. Consequently, there is a need of broadening the empirical base when examining views related to chance variability.

Responding to this research need, the present study aims to investigate views related to chance variability of learners of different age groups and to evaluate a corresponding questionnaire instrument.

DESIGN, METHOD AND RESULTS

The views related to chance variability were examined by using a set of four tasks designed for this purpose. The items included discrete and continuous situations which allowed a parallel top-down coding of three main categories of views ranging from determinist views to views marked by an awareness of randomness and variation. The evaluation of the corresponding questionnaire instrument concentrates on a qualitative validation of the coding guidelines. The data presented on the poster comes from a sample of more than 450 primary, 600 secondary and 350 university students who were asked to fill in the questionnaire.

The data supports that the three categories of views defined in the top-down coding are marked by qualitative differences of the learners' answers to the items. Replicating the results of prior studies, we observe frequent determinist views, even in the group of the university students.

CONCLUSIONS

The data presented in this study supports the validity of the four-item-questionnaire and the top-down coding. Beyond illustrating the quality of views related to chance variability, the instrument allows further analyses about interdependencies of these views and statistical literacy.

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