

WORKING WITH CLAIMS ABOUT SOCIETY CONTEXTS BASED ON STATISTICS AND PROBABILITY - CRITICAL THINKING AS A KEY AND AS A CONSEQUENCE

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BACKGROUND: When learners work with statistics about society, both Statistical Thinking (ST) and Critical Thinking (CT) should be in the focus. For dealing with data about society in a reflected way, CT is a key for a better understanding, but also for using and acquiring ST strategies. Conversely, there are findings that CT can be fostered through learning opportunities focused in ST and based on statistics about society. Looking at these findings, it appears that Critical Thinking can be a key for interpretation of data about society as it may, for instance, open up the way to helpful questions and for evaluating data-based claims about society contexts. At the same time, improved Critical Thinking skills can be a consequence of working with statistics and probability related to society contexts. Indeed, also the theoretical frameworks of Critical Thinking (CT) and Statistical Thinking (ST) suggest an overlap – however, both on the theoretical level and on the empirical level, this overlap has hardly been subject to systematic research. There is hence a research need related to key learner variables for their work with statistics about society. Correspondingly, we refer to and discuss selected findings from theoretical analyses and from two empirical projects. The theoretical analyses start from two sides: On the one side, theoretical approaches to ST with a solid empirical foundation are explored (e.g. Watson & Callingham, 2003) and related to theoretical conceptualizations in the domain of on the one side (e.g. Lipman, 1991). However, as CT approaches are very diverse, the perspective needs to be focused. For such foci, two complementary studies can provide help. A first study (Aizikovitsh-Udi, 2011) examined how certain aspects of CT can be fostered through an intervention with emphasis on probability (and related to society contexts), and a second study (e.g. Aizikovitsh-Udi & Kuntze, 2014) explores which role the use of CT strategies can play in the solution of tasks that require ST.

METHOD: In these empirical studies, different methods have been integrated. In the first study, a CT test has been used for quantitative insight and complemented by qualitative methods. The second study focused on task-based interviews which were analyzed by interpretive methods (for more details see Aizikovitsh-Udi & Kuntze, 2014).

FINDINGS and CONCLUSIONS: Whereas the findings from the first study suggest connections between CT and ST, the second study reveals that these connections can be very complex: CT may be helpful for ST, but CT is a key which can also “open doors” which do not immediately lead to deepened ST. The findings suggest that in the school classroom a combined support of CT and ST should be balanced – and enriched by the use of metacognitive strategies so that learners can learn to monitor their thinking strategies and hence prompt themselves to combine strategies from either domain.

References:

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