FROM VISITING STATISTICAL CONTENT TO QUESTIONING THE WORLD

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PARADIGM OF QUESTIONING THE WORLD

The implementation of inquiry proposals in statistics collides with many constraints related to pedagogical paradigms whereby students visit statistical content and methods without reflecting on whether the answers obtained are relevant. We need to establish alternative situations in which students can understand the world around them by addressing meaningful problems and elaborating new questions—a shift from visiting statistical content to the paradigm of questioning the world (PQW). Today, the prevailing educational paradigm is the paradigm of 'visiting monuments' (PVM) (Chevallard, 2007, 2015). To go beyond PVM, we need to establish situations where students can understand the world around them by addressing meaningful problems and elaborating new questions.

We asked the following research question: How do grade 7 students inquire and validate answers in relation to the question "Can we affect climate change if we modify our eating habits?" and how does the dialectic of statistical inquiry and reasoning support (or not) the students' development of final answers?

The research design follows the principles of didactic engineering. A team of grade 7 teachers and a researcher developed a PQW course in a cyclic process of workshops, design phases, implementation, reflection and revisions, and analysis of the educational activity. In the analysis of the classroom processes, we used question-and-answer diagrams (Q&A tree structures) (Jessen, 2014; Winsløw et al., 2013).

The results visualized in the Q&A diagrams show how students' dialectic of statistical inquiry and reasoning evolved in an interdisciplinary context with no content boundaries between statistics and STEM (science, technology, engineering, and mathematics) subjects. There was a preponderance of inquiry processes. Students inquired about and elaborated on a real-world problem and experienced the fact that statistical techniques and technologies provide answers that are useful not only in a school context. The students did not use or develop statistical theories or discuss *how* or *why* an answer was valid. We did not see a dialectic process of inquiry and reasoning.

The PQW approach has some constraints when focusing on STEM teaching, both because of teachers' lack of experience with interdisciplinary teaching and because statistics has a focus of application. The classical distinction schools place between school disciplines is also a challenge if we want to base teaching on generating questions and addressing problems that go beyond the boundaries of school disciplines.

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