

The devil in details: Mathematics teaching and learning as managing inter-discursive gaps

Anna Sfard
University of Haifa
<sfard@netvision.net.il>

Once teaching-learning events are conceptualised as inter-discursive encounters, it becomes clear that mathematics classroom talk is rife with invisible pitfalls. There are many types of unacknowledged discursive gaps, some of them necessary for learning, and some potentially harmful. Such gaps may exist also between the teacher's intentions and her own habitual moves, most of which are too brief and automatic to be controlled. Unknown to the teacher, her basic communicational routines may constitute invisible crevices through which the prejudice enters the conversation on mathematical objects.

In this talk, I argue that if the devil is in the finest, possibly imperceptible detail of classroom communication, it is the detail that must be considered in the attempts to exorcise the devil. My aim is to construct tools for detecting the gapes and for dealing with them so as to turn them from obstacles into opportunities for learning. I begin by defining communicational gap and fathoming its nature and possible reason. This is done by introducing the construct of routine and the claim that learning can be conceptualized as routinization of our actions (and this includes our thinking; see Lavie et al., 2019). Routine, this basic, recursively expandable unit of analysis, is said to be composed of two parts: the task that the performer tries to attain and the procedure she recruits for this purpose. The tasks are personal constructs – these are people's individual interpretations of the task-defining situation, or task-situation (in school, task-situations are usually brought into being by teacher's requests). This means that the tasks, as seen by the participant, may be the main generators of communicational gaps: the performers (e.g., students) do not necessarily see themselves as performing the same task the task-setter (the teacher) had in mind; and vice versa: the task the teacher sees herself as performing is not the one he students attribute to her on the basis of her performance.

These conceptualization is illustrated with multiple examples from mathematics classrooms. Using the concept of routine, I zoom into the data and identify seemingly negligible details that may constitute, for better or worse, powerful shapers of students' learning. The vignettes illustrate the claim that some of the communicational gaps are inevitable. I argue that these ineluctable discursive discontinuities should be embraced as opportunities for learning. In contrast, those gaps that do little more than jeopardize learning – and my examples imply that these are not any less frequent than the useful ones – can and should be prevented. In all the cases, however, the devil hides in the tiniest details of interpersonal communication and our first task is to learn how to make the gaps visible.

I conclude with a reflection on how mathematics teachers may sensitise themselves to discursive pitfalls, how they and their students can benefit from those communicational gaps that are likely to generate learning, and how they can cope with those divides that hinder the process or infect it with unwanted messages.

References

Lavie, I., Steiner, A., & Sfard, A. (2019). Routines we live by: From ritual to exploration. *Educational Studies in Mathematics*, 101(2), 153-176. Retrieved from <https://rdcu.be/RUoM>.