Two well-known challenges in chemistry education are: developing problem-solving skills by students and teaching of these skills by educators. Extensive chemical education literature deals with the nature of associated difficulties and instructional approaches to address them. One of the main difficulties experienced by students, when solving chemistry problems, stems from the lack of process skills.

We have tackled this challenge by developing and evaluating the problem-solving workflow “Goldilocks Help” (Yuriev et al, 2017). It provides specific scaffolding for students faced with procedural difficulties related to solving chemistry problems. The evaluation showed that the workflow helped to shift students’ beliefs about their abilities to use productive self-regulation strategies in problem solving: planning, information management, monitoring, debugging, and evaluation. In fact, analysis of student work showed that many of them could effectively regulate their problem solving though planning and analysis (Yuriev et al, 2019). Furthermore, students who demonstrated structured problem solving and explicit reasoning in their work were more successful in their problem-solving attempts. However, contrary to their stated values, they still found it challenging to monitor, debug, and evaluate effectively. In this presentation, I will use exemplars of student work as well as aggregated analyses to illustrate these findings.

We propose that it is important to constructively align teaching and learning activities with assessment that explicitly encourages students to demonstrate their reasoning, and other reflective and evaluative practices, during problem solving.
