

growth stage_Poster_PME

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GROWTH STAGES FOR INSTRUCTION-DESIGN TEACHERS

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We discuss three issues on professional growth for instruction-design teachers: (1) In what situations and to which extent is a teacher characterized as an instruction-design teacher? (2) What growth stages of the teachers can be identified through their participation in design-based professional development? (3) Is the identified growth stages generalizable to other mathematics teachers and other research settings?

Accordingly, we define teachers as instructional designers when they participate in creating any kinds of resources (e.g., task, manipulatives, tests) for a particular teaching purpose. By designing instructional materials, teachers have opportunities to enrich their pedagogical power through actively transforming and coordinating different sources of information into the creation of the work. We further used a selected mathematics teacher, Hao, to illustrate two distinguished growth stages: stage for understanding school mathematics and that for experiencing fundamental ideas in mathematics. Hao at the understanding-school-mathematics stage aimed at creating tasks that allow students to learn well-defined mathematics knowledge in textbooks and to apply the learned knowledge to solve a variety of problems. But when he headed to experiencing-fundamental-ideas stage, he changed his design intention and was able to create tasks in correspondence with the intention. He thought the importance of tasks is the opportunities for students to experience the fundamental ideas from which mathematical knowledge are developed and to engage in learning mathematics through discussions between students and teachers. In line with the design intention, he created a task titled as “centers in a triangle” by coordinating his understanding of curriculum materials, the aims set up in professional development, and peer teachers’ design experiences. The task entails students to activate their common senses and explore fundamental ideas for the follow-up learning of mathematics. Hao’s growth in profession was recognized by other teachers in the professional development but they expressed the difficulties in creating such work. Teacher Li said

Li: All of my designs look similar...no matter how hard I have tried...I feel the constraints of my designs as I could not go further...I would like to know and analyze Hao’s brain to see how he can create such good tasks.

Li’s reflection pointed out the significant growth difference in the two stages. In view of that, the follow-up research question is the extent to which the classification of the stages can be used to explain different teachers’ professional growth and be generalized to other research settings?

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