

## SECONDARY SCHOOL TEACHERS' PEDAGOGICAL CONTENT KNOWLEDGE

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Current research on mathematics teachers' subject matter knowledge, which includes knowledge of the content of a subject area as well as understanding of the structures of the subject matter (Schulman, 1986, 9), has been investigated in a large number of recent studies (e.g. Ma 1999; Attorps 2003). The research results are essentially the same: teachers lack a conceptual knowledge of many topics in the mathematics curriculum. Current research on the relationship between teacher knowledge and teaching practice has also pointed out the need to carry out more studies involving specific mathematical topics. Furthermore, this research has shown that the way teachers in mathematics instruct in a particular content is determined partly by their pedagogical content knowledge i. e. knowledge that is specific to teaching particular subject matter (Schulman, 1986, 9). In this article I discuss ten beginning and experienced secondary teachers' pedagogical content knowledge concerning the concept equation. Data was gathered by interviews and videotapes and the phenomenographic research approach was applied in the investigation. This approach illustrates in qualitatively different ways how a phenomenon, an object around us is apprehended and experienced by individuals (Marton and Booth 1997). My results indicated that teachers' conceptions about the purposes for teaching equations stress students' procedural knowledge of the concept equation rather than their conceptual understanding of the mathematical notion. Both beginning and experienced teachers presented detailed knowledge needed to identify specific student difficulties of this particular concept. However experienced teachers possessed more rich repertoires, experiments and explanations of the concept than beginning teachers did. They also show a bigger ability than beginning teachers to construct situations and instructional strategies that might assist students to overcome their difficulties with equations.

### **REFERENCES**

- Attorps, I (2003) Teacher' s images of the 'equation' concept. Available at: [http://www.dm.unipi.it/~didattica/CERME3/draft/proceedings\\_draft/TG1\\_draft](http://www.dm.unipi.it/~didattica/CERME3/draft/proceedings_draft/TG1_draft)
- Marton, F., Booth, S. 1997. Learning and Awareness. Mahwah, N.J.: Law Earlbbaum.
- Shulman, L. 1986. Those who understand: Knowledge growth in teaching. Educational Researcher, 15, 2, 4-14.
- Ma. L. (1999). Knowing and teaching elementary mathematics: Teachers' understanding of fundamental mathematics in China and the United States. Mahwah, NJ: Lawrence Erlbaum..