TEACHER TRAINING IN MATHEMATICS: INFLUENCE IN AIDA'S PROFESSIONAL DEVELOPMENT

Cristina Martins, School of Education, Polytechnic Institute of Bragança(Portugal), mcesm@ipb.pt,
Leonor Santos, Institute of Education, University of Lisbon (Portugal), leonordsantos@sapo.pt

Research Goals

To study teacher's professional development through participation in the Training Program in Mathematics for Primary School Teachers

Research Questions

- How does a teacher's professional knowledge evolve throughout training? In particular, mathematic and didactic knowledge?
- What changes can one see in the teachers' teaching practices throughout training? How does the teacher identify and justify them?
- How does the teacher's reflecting ability evolve throughout training?
- What is the contribution of portfolio usage to the teacher's professional knowledge?

Theoretical Framework

- Teachers' professional knowledge: practical nature (Elbaz, 1993), knowledge in action (Schön, 1983), action-directed knowledge (Santos, 2000)
- Knowledge about mathematics and about pedagogy (Shulman, 1986; Sowder, 2007; Wu, 1999); didactic knowledge (Santos, 2000)
- Teaching practice: planning (Pacheco, 2001); class direction – nature of tasks, discourse, classroom environment (NCTM, 1994, 2007; Ponte, 2005); formative evaluation (Santos, 2002)
- Professional development strategies: reflection (Schön, 1983; Serrazina, 1999); collaborative work (Day, 2001) participation in training and projects (Hiebert, Gallimore & Stigler, 2002); portfolio building (Lyons, 2002)

Training Program

- Kinds of sessions (i) group training sessions ; (ii) classroom supervision sessions
- Evaluation based on portfolio building

Methodology

- Qualitative methodological approach (Teddlie & Tashakkori, 2003)
- Three case studies (Stake, 2005)

Participants

- Aida, Dora e Sara: Three teachers of Primary School voluntarily enrolled in Training

Data Gathering

- Started in the academic year of 2006/2007
- Semi-structured interviews (initial, intermediate, final and after 2 years), post-observation interviews (4), field notes, documental gathering, participant observation (4 classes and 15 group training sessions)

Data Analysis

- Data interpretation, considering the problem studied, theoretical assumptions and empirical work

Ponte et *al.* (1997) Santos (2000) Day (2001) Serrazina (1999) Schön (1987) Zeichner (1993)

Ponte (2005) (NCTM, 1994, 2007) Santos (2002) Lee (2005) Klenowski (2005) Martinho (2007) Menezes (2004)

Didactic Knowledge

- Valuing tasks of a more open character
  - New meaning given to problem solving
  - Conducting mathematic research in the classroom for the first time
  - Discovery of new possibilities in manipulative materials usage

Aida's case

Reflection

- Usefulness in reconstructing practice
- Learning about what to reflect: activity planning; evaluation of what the students might possible have learned; importance of the activity for the teacher; future teacher's perspective regarding Mathematics
- Importance of the script
  - Content and depth of reflection
- Importance of portfolio building
  - Compulsive character of reflection
- Identification of several ways of reflecting and respective importance

Teaching Practice

- Classroom communication
- Creating a learning-prone environment
- New forms of evaluating

- Questioning
- Communication and discussion of solving methods and task results
- Written record of task results

- Students' opinion about their participation, involvement and learning achieved with tasks undertaken
- Analysis of student written productions

- Different ways of organizing classroom work: individual, in pairs and group work
- Orientation and incentive of students' work in performing activities

Perrenoud (1999) Stein *et al.* (2008) Ponte & Santos (1998) Ponte & Serrazina (2000) Franke, Kazemi & Battey (2007)