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PLANNIG TEACHING ACTIVITY WITHIN A CONTINUOUS TRAINING PROGRAM

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The present text is part of a more comprehensive work purporting to study the professional development of primary school teachers within the program for continuous training in mathematics (PCTM). We will present a cross analysis of the case studies of teachers Dora and Aida, focusing on the meaning they confer upon the process of planning a teaching activity, tasks planned and planning development within PCTM. Aida bestows great importance on this process. Dora's participation in PCTM widened her horizon to the necessity of undergoing it.

Key-words: teacher planning, practice, teacher training

FOREWORD

This text is based on a work whose main purpose is to study the professional development of in-service primary school teachers within the program for continuous training in mathematics (PCTM). We specifically wish to ascertain how didactic knowledge relating to teachers planning develops through participating in PCTM. I.e.: what meaning do they confer upon planning? How do they plan? What sorts of tasks do they select?

We consider that professional development is conceived as a permanent, continuous and intentional process, aiming at improving professional knowledge, teaching practices and reflection thereupon, thus contributing towards better students' learning in Mathematics (Guskey, 2002; Sowder, 2007). Participation in training programs is taken to be a tool for professional development (Guskey, 2002; Wu, 1999). One of the goals of PCTM is "to foster the undertaking of curriculum development experiences in mathematics which contemplate class planning, class direction and reflection by the teachers involved, supported by peers and coaches" (Serrazina *et al. 2005*, p. 3), thus foreseeing that in PCTM there will be an intentional investment in the aforementioned components. Thus, this program aims at providing, throughout the academic year, a site for experimentation and joint reflection, between teacher-trainer and trainees, so that one can reflect upon practices and use them to develop a sustained knowledge, which takes into account the characteristics of the students it addresses (students aged 6 to 10).

The activities to be developed within this program, take the form of:

– Group training sessions (GTS), biweekly joint sessions for planning and reflection upon activities associated with the teaching practice, involving the teacher trainer and a group of teachers voluntarily enrolled in PCTM.

– Classroom supervision sessions (CSS), sessions for the development of classroom curriculum activities corresponding to conducting practices materializing the planning detailed in the joint sessions and respective discussion, involving the teacher trainee and the trainer in her role as supervisor;

– A joint work session for the development of other enlivening actions with the teachers.

As far as evaluation is concerned, the elaboration of a portfolio reflecting the professional development resulting from the training is proposed.

In this text we wish to present Aida and Dora's vision of the planning process, trying to perform a cross analysis of these two cases on the basis of the following categories: (i) meaning/importance of planning; (ii) tasks planned under PCTM; (iii) weight of planning undertaken under PCTM; and (IV) collaborative work in performing planning.

THEORETICAL FRAMEWORK

Teaching practice is a key component of a teacher's professional life. Teaching Mathematics, regardless of level, involves students, teachers, administrators and schools in contexts which change on a daily basis making the creation of a formula, "a kind of guide", or even of a set of practices teachers can adopt, difficult (Franke, Kazemi, & Battey, 2007). Within teacher's action three basic stages are usually considered, concerning teaching practice: pre-active, interactive and post-active phase. (Canavarro, 2003; Clark and Peterson, 1986, Santos, 2001; Vale, 2000). Classroom practice begins with planning, this being the phase were the teacher identifies content, materials and teaching methods necessary for the practice. For Yinger and Hendricks-Lee (1995) teachers have, on one hand, daily and yearly, the responsibility of selecting and conceiving learning experiences based on course content and, on the other, must be prepared to take the utmost profit from non-planned teaching opportunities which might arise in the course of educational interactions, and being able to achieve these purposes thus demanding preparation.

Pacheco (2001) sees planning "as a practical activity allowing the organization and contextualization of didactic action taking place at classroom level" (p. 104), presenting two main functions, one being to clarify what one wants to perform in the classroom and the other to predict and modify forecasts, throughout the process in agreement with the didactic situation (Pacheco, 2001). Thus, "the act of planning presents itself as a specific and essential teacher's competence which allows him/her to configure, by means of a mental or written plan, the several didactic elements used as a basis to structure the teaching learning process, providing a reduction of incertitude or insecurity" (Pacheco, 2001, p. 105). Even when written plans are produced, they represent only a small part of the true planning that has been taking place in the teacher's mind (Arends, 2007, p. 100).

According to Yinger and Hendricks-Lee (1995), to be prepared for interactions as dynamic as the ones that take place during class seems to be less a question of prediction and control and more a question of preparation and response ability. Specifically, the teacher must anticipate difficulties and student's resolution procedures, foresee how to monitor them and sequence the possible interventions and connections that might be established (Stein, Engle, Smith, & Hughes, 2008). Within this framework, planning producing more generic charts, more flexible and activity-based, will be more useful than the one producing strictly specified and goal-oriented plans. Likewise, plans will become more useful if not conceived to be implemented as means for interaction control, but rather as framing tools purveying a starting point for educational interactions (Yinger & Hendricks-Lee, 1995).

The selection of tasks to submit to students is envisioned as the main point for planning the teaching/learning process (Fernandes, 2006; Ponte, 2005). It is up to the teacher to be responsible for their preparation and direction, taking three concerns under account: mathematical content, students and their learning paths. It is also important to understand how students and teachers *deal* with the diversity of existing tasks, namely concerning evaluation of work undertaken, progress achieved and difficulties to be faced, and cognitive and metacognitive processes and strategies associated with each range of tasks submitted to them (Fernandes, 2006).

The possibility of performing teaching practice collaborative planning work allows capitalizing energies, to provide extra support, to multiply perspectives, to enrich reflection (Serrazina *et al.*, 2006). Collaborative learning as a professional development strategy (Marcelo, 2002) involves group-oriented formative processes, causing not only that learning activities be performed with others in interactional context but also that goals and results of such learning also present a collaborative aspect. PCTM is presented as a privileged means to perform this task (Serrazina *et al.*, 2006). In the context of teacher's professional development Joubert, Back, De Geest, Hirst and Sutherland (2010) state that there are different models but most of them aim at providing opportunities for teachers to become involved in learning and change processes. They suggest, however, that different teachers, influenced by their work contexts and personal motivation, beliefs, theories and experiences, will perceive different opportunities, and such perceptions may change in the course of time.

INVESTIGATION METHODOLOGY

The undergoing investigation is qualitative/interpretative in nature (Teddlie & Tashakkori, 2003), using case study techniques (Stake, 2007).

The wider study has considered three primary school teachers, Aida, Dora and Sara, belonging to the same training group, who enrolled voluntarily in PCTM. Selection criteria were number of teaching years and academic training. In this text we will only focus on Aida and Dora.

Aida is about 45 years old, and has 25 years experience as a teacher. She underwent one year in PCTM. As academic training she has a primary school teacher's degree (three years course), a specialized course of superior studies in the French teaching area (license degree) and a master's degree in History of Education. Mathematics has always been one of her favorite subjects, although her post-college training has been unconnected with this area. From PCTM she hopes to become up-to-date and try that "children might learn to see mathematics in a different way, as a subject that can be interesting" [Aida, portfolio].

Dora has less than 10 years teaching experience and is about 40 years old. Dora underwent two years of PCTM. She has a license degree (four year course) in Basic Teaching, specialized in visual and technological education, enabling her to teach in primary school. Her life as a student is determined by mathematical failure and a conflictive relationship with it. Dora expects from PCTM "to be able to overcome myths" [Dora, first interview] she has felt since childhood and to learn.

Data gathering started in the academic year 2006/2007 and took place for two consecutive years, through semi-structured interviews (namely one initial, one half-way, one final, one two years after completion of the program and four post-observation interviews conducted with Aida who only took one year of training, the same number with Dora plus 5 post-observation interviews in the second year of training) participant observation of the Group training sessions and of the Classroom supervision sessions, and documental analysis of materials produced by the teachers and field notes and accounts of the teacher-trainer.

Following an interpretative paradigm an analysis of information started at the end of the training year, consisting in organization and interpretation of data, according to *à posteriori* defined categories, taking into account the problem under consideration, theoretical presuppositions and empirical work undertaken. The interpretative paradigm subscribes to a relativistic perspective of reality "envisaging the real lived world as a construction of social actors who, at each moment and place, construct the social meaning of events and phenomena and reinterpret the past" (Santos, 2001, p. 186).

In this text, according to the categories developed, different topics were found characterizing these teachers' vision about the process of planning teaching activity.

AIDA AND DORA: PLANNING TEACHING PRACTICE

Meaning and importance of planning

To Aida, planning teaching activities is a key aspect of the teaching/learning process, assertively stating that she has always planned, specifically noting the prediction relevance of the aspects planning includes:

> I really don't know how people manage to teach a course they have not planned beforehand. Although there might be one day when one does not have the time, but

> everything is lined-up in one's mind. As rule I have everything actually written down. [Aida, initial interview].

In her final interview she mentions class preparation, seeing it as a privileged moment to consider the several aspects present in a class, an essential condition for its success:

> It is essential because when we are preparing the course we reflect about class content, about the material we are going to bring, about what students know and about how to do it. So, I think one has to go this way. We must prepare every class for it to succeed, although improvisation is important, but only up to a point. I think preparation is essential for every class to take place as we want it. [Aida, final interview]

Dora clearly associates planning task to writing, which she claims not to like: "It is true, I don't like it, I never did" [Dora, initial interview]. She claims she usually prefers to mentally plan tasks, and only organize some ideas on paper, which are often changed when she enters the classroom:

> I always think about what to do, but I don't write every step down, every step I must take, that is, I put down some topics for my own guidance, it's my way of organizing myself. Of course I prepare materials, the files I am going to use, and I bring it with me like that. I just get there and I don't follow a script, never, never. [Dora, initial interview]

In her final interview, she talks about planning teaching activities during PCTM clearly reinforcing the importance of the selection of tasks to put forward: "After having had the idea I prepared the material, oh yes… . That part is what's more important. For instances I made up the problem I was going to bring with me. And some of the material I used. If its correctly made up, why not using it, right?" [Dora, final interview].

At the end of the first year of PCTM she assumed the importance of planning, namely referring to planning investigation activities (speech 1) as well as undertaking planning in general (speech 2):

> 1. I prepared classes, that's obvious, it's just that I did it lightly, and not anymore, I go down to details more. Even because regularities tought me, I must pay more attention to that part, I must be rigorous when I prepare classes, to know whether or nor I am prepared for the answers and questions of students. [Dora, final interview]

> 2. Useful to know what we are going to do, to have a sequence, to know the steps we have to take, to consider what we are going to do, what must be done, the objectives, to know all those steps. [Dora, 2nd post-observation interview]

Although Aida has always acknowledged planning as an essential part of the teacher's teaching practice, associating it to a written record, Dora became, through participation in PCTM, more sensitive to its necessity, distancing herself from the idea of something exclusively mental and mainly associated with selecting tasks to face the students with.

Tasks planned in PCTM

Ever since the beginning of their training Aida and Dora have decided to experiment in tasks that were not usual in their teaching practice which caused them, for instances, to gain a new vision on the meaning and importance given to problem solving. Although Aida considered that problem solving was part of her classroom strategies, she had seldom presented problems that could not be solved directly through the use of an algorithm and whose resolution was possible using different strategies. This aspect is remarkable in her choice to include this task in the portfolio:

> The choice of this task to become a part of the portfolio is due to the fact that it was precisely the first and, as such, was surrounded by larger expectations. Another reason which has defined my option is also related to its content. Introducing a "different" kind of problem from the ones you usually face the students with, which constitutes a challenge regarding my professional practice. [Aida's portfolio, justification for inclusion of the first task]

Dora also mentions that before the training she already engaged in problem solving, but that she considered them to be different from the problems she currently uses, upon which the student can use different solving strategies:

> But they were not problems just like these, sort of games that cause mental reasoning to develop, that make them think, that can be practical, useful for their daily life, less routine. And they do them very gladly and with much more willingness than the others. The others are much more a mathematical task. That is an operation! Is it a sum, a subtraction, or a division? It's always the same thing. And in these problems they don't see it, they see them as game, a challenge. [Dora, 1st post-observation interview]

Thus, for both of them, the tasks planned within PCTM have constituted a challenge in setting up a new meaning.

Elaboration of planning within PCTM

Resorting to planning developed within PCTM. Aida followed planning worked out within the training group, but always adding a personal touch to it. For instances, in the first task undertaken, Aida thought about presenting the students with a problem similar to the one worked out in the group, but adapted to a context fitting the Christmas season, stating regarding this in the 4th GTS: "I am going to make the experience" and she went on "I'm thinking about introducing precisely this one for a 4th grade, not the spider, but with Santa Claus, giving it another development". [Aida, transcript of 4th GTS]

While experimenting with classroom tasks, Dora based herself upon the planning "discussed in the group" but "afterwards did not follow them to the letter" [Dora, final interview]. According to herself, this option his connected to her own way of being; "Besides, if I get stuck to a piece of paper I am less spontaneous, I don't feel

like myself. I like to improvise, …" [Dora, final interview]. However, when she talks about not fulfilling the first planning undertaken within PCTM she also grounds her justification in the students:

> The fact that I did not lecture everything I had planned to, was my own option, and because, as I already mentioned, the students had perfectly understood the mechanisms for solution. Thus, to continue would only be useful for the students to apply the already mechanized procedure. Besides, I did what I ought to have done, we must not stick to what is written down, in this case in the planning, but, instead, in under what conditions is the activity carried out, what the students needs are, and, unquestionably, their mental availability. This is a factor that has a great weight in my way of living the profession. [Dora's portfolio, 1st written reflect]

Thus, while Aida when elaborating her planning adapts it to her students, Dora adapts it to herself, although having the students under consideration.

The role of collaborative work. Aida has always been careful to prepare her planning in writing and in detail, and to discuss it within the work group. "We went on to Aida's planning, who presented in detail the task she intends to explore, an activity of mathematical investigation based upon a multiplication double entry table" [report of the 7th GTS]. In planning classroom tasks she not only profited from and requested collaboration from colleagues, as she gave her own opinion about other people's work. In the 4th Group Training Session she questioned a colleague about how on long it had taken to perform a problem solving task: "Is is a 3rd or a 4th grade?, How long, more or less, has the task taken?" [transcript from the 4th GTS]. In the same session, faced with the suggestion of a problem put forward by a member of the group for experimentation in a classroom, she mentioned: "It seems to me even more complicated [than the one with the spider]" [report of the 4th GTS].

She also never refrained herself from asking the supervisor for clarification which could help her to sort her ideas out and, simultaneously, in planning tasks:

> I was thinking about, this time, a mathematical investigation activity starting from a double entry multiplying table, correct me if I am not using the appropriate terminology, (…) And since we are in a clarifying mood, regarding the 2 multiplying table, is it more correct to say that 1 x 2 , 2 x 2, 3 x2, 4 x 2, or, instead, 2 x 1, 2 x 2, 3 x 2, 4 x 2, as we were taught. [transcript of the 7th GTS]

In her portfolio, she alludes to and includes the material given by the supervisor in the group training sessions "since these constitute an essential support for the choice and programming of the task", including "[Internet] research carried out during preparation phase, because I consider that the whole process of teaching and learning presupposes some kind of investigation", indication of bibliographic research carried out, as "it also turns out to be a legitimation of some of the options taken" [Aida's portfolio, justification for the inclusion of the material used in the preparation of the first task].

Dora also considers the participation of the other elements of the group and the supervisor in carrying out planning. Thus in the 7th Group Training Session Dora shares some of her concerns regarding time management:

> We proceed to Dora's planning, who had previously exchanged some ideas with me through e-mail. Her task consist in finding regularities in the 2, 5 and 9 multiplying tables, with the students grouped in pairs.
>
> Dora: Do you think I can use up the whole time just with this?
>
> Reseacher: I think so, if you let them air their discoveries.
>
> Dora: Aida has got so much here! (...) [Report of the 7th GTS]

Dora mentions in particular the importance of the supervisor in preparing the tasks to experiment. Specifically about the second task undertaken, she makes it clear that she needed "a lot of help from you, a lot of guidance", which leads her to conclude: "but I also learned from this, it's not just that you helped me, you helped me out with doing the planning and you taught me how to do it" [Dora, 2nd post-observation interview] As a matter of fact, Dora recognized that planning a mathematical investigation activity for the first time constituted a controlled risk, as she was participating in the program and had the support of the supervisor, and also recognized that student's activities and their learning from undertaking this task, overcame all other factors. "I risked it because I had the support of the supervisor, in case it would be needed, and as I liked the theme, I thought it was interesting for students, as they could perform several explorations and, lead them to be interested, in a more attentive way, in the numbers and in the investigation" [Dora's portfolio, justification of the choice of the 2nd task].

To Aida, collaborative work, either with the whole group either with the supervisor, was used in a double perspective, for her own support and for that of the others. It was seem as a multidirectional collaboration. For Dora instead, this working context, relies more upon the supervisor, and in a one way direction. It is a one directional relationship, to learn.

FINAL CONSIDERATIONS

The starting point of these two teachers is clearly different, so it would be expectable that their professional development during PCTM would also be different. Aida starts out from two kinds of expectations for the training, one connected to teaching, one connected to learning, helping out her students, Dora, on the other hand, takes teaching as her strong bet, to learn and to gain confidence in an area with which she has always entertained a conflictive relationship.

Aida identifies the different aspect present in planning, contents, tasks and materials, methodologies and what students already know (Canavarro, 2003; Clark and Peterson, 1986, Santos, 2001), while at first Dora concentrates herself on the materials, seeming that the associated objectives are not determinant for classroom

work orientation. For Aida, one needs to clarify in order to be able to modify (Pacheco, 2001), Dora instead, who stresses the importance of change within the class, does not associate it with a thorough preparation, but rather to her whim of the moment, resorting to the unforeseen. With the course of the training, Dora begins to mention the importance of planning to ascertain the sequence of the task in accordance with the objectives defined and to be prepared to answer students (Stein, Engle, Smith, & Hughes, 2008) and address unforeseen situations of the teaching practice to use them for the better advantage (Yinger & Hendricks-Lee, 1995), recognizing the advantage of resorting to a written record.

The planning undertaken in group during training constitutes the starting point for both teachers. However, once again, one can see that while Aida valuates from the very beginning the learning component, adapting it to her students, Dora centers herself upon teaching, adjusting it in the classroom to herself, also taking the students under account. The different levels of professional development that both teachers present are also shown in the way they profit from collaborative work undertaken during training, as an asset to all elements involved (Hargreaves, 1994), or as a context for personal learning. However, the tasks carried out during training have constituted a context for professional development for both teachers.

With the analysis of a training program with specific and innovating characteristics we aim to provide answers which contribute to improve initial and continuous teacher training. However, from the evidence gathered from these two cases, the question remains to determine up to what point the same training format can apply to such different teachers. In which way can one foster professional development of teachers starting up from different levels? How to ensure the sustainability of this program?

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