Teachers´ Practices and Mental Models: Transformation Through Reflection on Action

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Abstract: This contribution explores the relationship between teaching practices, teaching discourses and teachers´ implicit representations and mental models and the way these dimensions change through teacher education (T.E). In order to study these relationships, and based on the assumptions that representations underlie teaching practices and that T.E might affect these representations, a T.E course was designed and implemented in Argentina. The course focused on teacher intervention in personal narrative telling in kindergarten. It was based on a reflection-on-action process. The personal narrative activities of 10 in-service teachers before and after the course were analysed employing the Process of Constant Comparison (Glaser & Straus, 1967). A case study was then conducted in order to infer possible transformations in one of the teachers´ implicit representations and mental models, through Content Analysis (Krippendorf, 1990) of in-depth interviews before, during and after the course.

Keywords: teacher education, mental models, teachers´ practices, personal narratives

Introduction

This contribution is part of a broader research project focused both on preschool in-service teachers´ professionalization, through continuing professional development, and on children´s cognitive and linguistic development in at-risk populations.[1]

Within this research project, the main goal is to understand the relationship between teaching practices, teaching discourses, teachers´ implicit representations and mental models, and the way these dimensions change through teacher education (T.E).[2] A T.E course was designed as part of 10 teachers' continuing education to answer these two questions: how do teaching practices and teaching discourses change after T. E.? What can practices and discourse tell us about changes operated in teachers´ implicit representations and mental models? By explaining how teachers are inclined to think (mental models) and act (teaching

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[2] Teacher education is here understood as a life-long issue, as continuing professional development; encompassing all the courses and activities performed to continually acquire new qualifications along a teacher´s professional career.

practices) in different teaching situations, this study illuminates what Cochran-Smith (2005) calls the 'black box' of teacher quality.

Teaching practices are understood as certain behaviours and actions regularly performed by teachers to turn reality into another reality (Barbier, 1999). They are a result of previous teaching experiences and they can become the source of new knowledge for teachers as well. Teachers´ behaviour, though singular, has its roots in social and institutional practices and it is only within this social environment that practices can be interpreted, understanding the way the teachers themselves make sense of it. But the ways the teachers make sense of the environment are not always expressed in their discourse directly. On the contrary, practices are in part grounded in tacit representations and mental models – perception, action and value schemes - which have been automated and naturalized in such a way that they are never questioned.

Reflection-on-action (Schon, 1987) ,carried out after the action is performed and promoted by group discussion, is considered one of the means to get access to these representations that underlie practices, because it allows to make explicit what otherwise would be left in the dark. In this sense, reflection on-action constitutes a tool for teacher continuing education. However, due to naturalization of the schemes that regulate practices, reflection on action is not a 'natural' process, it needs to be aided and scaffolded through different means that create a distance from one´s own actions. Group discussion and seeing oneself in video can be one way to promote it.

In this frame, the present study in particular will examine the transformation that took place in the teaching practices concerning personal narrative activities of a group of 10 preschool teachers working in contexts of poverty in Argentina after participating in a specific reflection-on action course. In a second phase, this paper will focus on the transformation of discourse and teaching practices of one of the participants to provide a more detailed analysis of phenomenon.

The Context of the Study

Given that the focus of this contribution relies on teachers´ practices, and considering that any practice is context- based[3], it is relevant that we carefully present the context of this study. Thus the objectives of the course the teachers attended can be better appreciated[4].

Our study is based on a series of strong ethical and theoretical assumptions. First, and in accordance with Argentina´s legislation, we assume that it is schools´ responsibility to provide every child, whatever his or her social background, with equal opportunities to develop the linguistic, cognitive and emotional tools needed to face the modern world. In Argentina, statistics show that we are far from fulfilling this goal (Rivas, 2010): School failure and the long-term consequences of this have been one of the most serious issues in the educational agenda for decades in Argentina[5]. In this context, the impoverished population is most affected by school failure and its long-term consequences.

In the second place, on the basis of empirical data (Borzone & Manrique, 2010; Darling-Hammond, 2000; Feiman- Nemser, 2001; Manrique & Borzone, 2012; Manrique, 2013; Wilson & Berne, 1999) we assume that teachers´ practices are a key factor in accomplishing school success. Indeed, especially in a disadvantaged context with specific

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[3] This means that it can only be understood within a particular environment´s rules and features.
[4] Only by understanding this context can the objectives of the course the teachers attended be understood and the implications of its success or failure be properly pondered as regards children´s learning opportunities.
[5] The income gap has broadened in the last 30 years, during which time its Gini co-efficient went from 0.36 to 0.50 (Rivas, 2010).

demands -where school is almost the only opportunity for children to access literacy practices-, teachers' role is crucial and decisive (Miller, 2011)[6].

In effect, it is important to take into account the high correlation between students´ development, teachers´ practices and high quality T. E. programs observed in several works (Darling – Hammond, 2000; Rivkin, Hanushek & Kain, 2005; Wilson & Berne, 1999).

Some studies, though, have shown that the level of correlation between teacher´s knowledge built through T. E and student learning has been low (Hill, Rowan, & Ball, 2005). One well known explanation for this low correlation in cognitive psychology is the problem of inert knowledge (Bransford, Darling-Hammond & LePage, 2005) – that knowledge that is theoretical and discursive but cannot be accessed and used in real situations. This fact explains the growing interest in studying teacher knowledge in the classroom and in context (Ball, Thames & Phelps, 2008) expressed in their practices.

In light of these data, our study focuses on the way teachers develop and change their practices when they weigh alternatives, reflect, judge, decide how to act and solve problems in this specific context (Ball, 2000; Ball, Thames & Phelps, 2008; Perrenoud, 2001). We also reflect on the nature of T.E. that might foster changes in teachers´ practices, as regards the different learning opportunities offered to the children.

T.E. in Argentina, particularly, has been part of secondary education since its inception. Today, it takes the form of a two-part system: the *terciario* (post-secondary) level, made up of the so-called *institutos superiores* (colleges of higher education), and the university level (Marquina & Straw, 2002). The two systems offer a range of qualifications and programs of different durations and varying contents. Information about how they are organized is scarce and difficult to access.

The complexity and lack of articulation of the system might, in part, contribute to explaining the differences in teachers' practices shown by numerous research studies in the region, and the different learning opportunities for the students that heterogeneous practices imply (Borzone & Manrique, 2010; Manrique & Rosemberg, 2009; Manrique, 2012; Rosemberg & Manrique, 2008). Beyond this, studies reporting on children's learning in Argentina show that, whatever the contents of teacher education programs, they have been proven to provide insufficient professional development to prepare teachers to face the complexity of the classroom and scaffold children's learning (Rivas, 2010), especially in contexts that differ from the teachers´ own social background.

Teacher Education and Teacher Practices

Thinking about Teacher Education means looking into the nature of the skills and knowledge intended to be affected. As we have already mentioned we are most interested in whatever underlies teachers´ decision making in real class situations (Ball, 2000; Ball, Thames & Phelps, 2008). There are numerous theoretical constructs that account for this intra subjective instance: implicit representations (Scheuer & Pozo, 2006); process of reflection in action (Schön, 1983); perception, value and action schemes (Zeichner, 1994); dispositions (Schussler, Stooksberry & Bercaw, 2010) and mental models (Jones, Ross, Lynam, Perez & Leitch, 2011; Mevorach & Strauss, 2012; Wilke, 2008).

According to Perrenoud (2001), facing classroom complexity, teachers develop strategies that later become powerful action schemes. These schemes or patterns that underlie

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[6] In general in these contexts, the groups of pupils are huge (more than 35 children); there are infrastructure problems (access to electricity, water, etc), lack of materials to work with the students, security problems (normally these schools are in dangerous neighbourhoods) and most of the children´s families are in difficult economic situations, lacking good nurturing and health attention.

practices help organize the 'chaos' the teachers may encounter but these schemes lack a theoretical basis and they are never called into question (Perrenoud, 2001). Pozo and his colleagues (2006) have studied these schemes, which they refer to as 'implicit representations'. From this perspective, decision making is mainly guided by these implicit representations, which sometimes even contradict the theories the teachers explicitly claim to espouse. While explicit representations are based on formal knowledge that has been received mainly through discourse in formal education, implicit theories cannot be taught, but instead develop through the detection of regularities in habitual activities. Implicit representations serve a pragmatic function: they aim to simplify the teaching environment by providing useful answers to questions that are never explicitly formulated, so as to be able to efficiently predict and control this environment. Having been automated and naturalized through the teacher´s lifelong experience as student, these representations are very hard to access consciously and thus to change (Perrenoud, 2001; Scheuer & Pozo, 2006). In fact, a number of studies have addressed the complexity of accessing implicit representations, attributing the difficulty of changing teachers' practices to it (Atkinson & Claxton, 2000; Davini, 1995).

Schön (1983) argues that professionals traditionally conduct their practice through evoking experiences of the same nature related to what they are experiencing and comparing them within a repertoire of expected outcomes they have built out of their experiences. This repertoire makes up a perspective that we believe to be the clue to understanding teachers´ decision making processes and their practice.

In this study we address the concept of mental model (Jones et al., 2011; Mevorach & Strauss, 2012; Wilke, 2008) to refer to this 'perspective' (Schön, 1983) that underlies teachers´ practices. As defined by Jones et al. (2011):

> Mental models are personal, internal representations of external reality that people employ to interact with the world around them. They are constructed by individuals based on their unique life experiences, perceptions, and understandings of the world. Mental models are used to reason and make decisions and can be the basis of individual behaviours. They provide the mechanism through which new information is filtered and stored (p.46).

The theoretical frame of the teaching education course concerned in this research is based on this notion of 'mental models'. We have chosen this construct since it allows us to look both into teachers´ thinking and action. In fact, Schön (1987) distinguishes three different kinds of mental models. Two of them are inferred when teachers express their thoughts: espoused mental models - inferred from the ways teachers speak about their teaching and on-action mental models, expressed when teachers speak about their videotaped teaching. The last one is the in-action mental model, which can be inferred from teachers' teaching practices, their real actions.

Even though it is very difficult to affect the three types of mental models that underlie teachers´ practices, this study rests on the assumption that it is nonetheless possible to do so. This assumption is based on a body of research and on empirical data (Barbier, 1999; Ferry, 1997; Schön, 1983; Perrenoud, 2001; Schussler, 2006; Schussler, Stooksberry & Bercaw, 2010) that has shown that reflection-on-action, which takes place after practice, allows access to what the different authors consider underlies teachers´ practices: implicit representations - in Pozo´s terms (Scheuer & Pozo, 2006)-, teachers´ mental models, in those of Mevorach and Strauss (2012), Jones et al. (2011) and Schön (1987). Reflection–on-action, after the action has been performed, as opposed to reflection-in-action, while the action is still being carried out, means creating a distance from experience, transforming it into an object to be analysed, asking oneself about what has changed because of that particular action and what

goals this change responds to. It affects teachers´ awareness of their beliefs, culture and values. Reflection can be fostered and scaffolded by different means; for example, viewing oneself on video (Kersting, Givvin, Sotelo, & Stigler, 2010; Kucan, 2007; Santagata & Angelici, 2010); or by inter-subjective exchange, dialogue and group discussions (Pareja Roblin & Margalef, 2013). These resources can help create the necessary distance from experience required by the reflection processes (Perrenoud, 2001).

Numerous studies have reported that the process of reflection-on-action can play a vital role in fostering transformations of teachers´ beliefs, points of view, knowledge and strategies (Dixon & Wilke, 2007; Eilam & Poyas, 2009; Freedman, Bullock & Duque, 2005; Kabilan, 2007; Kang, 2007; Kucan, 2007; Manrique & Borzone, 2012; Pareja Roblin & Margalef, 2013; Schussler, 2006; Schussler, Stooksberry & Bercaw, 2010). For instance, Schussler, Stooksberry and Bercaw´s analysis of teachers´ dispositions in 35 teaching journals in U.S.A shows that those teachers who possessed the greatest awareness of their dispositions also showed a propensity to unpack their assumptions, adopting multiple perspectives, questioning the how and why of their thinking and actions and balancing the focus on students and the focus on the self.

The limitation of some of these studies, though, is that they examine only teacher thinking and do not directly observe teacher behaviour (Schussler, Stooksberry and Bercaw, 2010). With respect to these limitations, our study focuses precisely on this particular relationship between thinking before, during and after action (teachers´ mental models) and behaviour (teacher´s practices). In this same line more specific research results have also shown that reflection based on video analysis of classes may not only affect teachers' reflective thinking abilities and metacognitive awareness (Bower, Cavanagh, Moloney & Dao, 2011; Charteris & Smardon, 2013; Danielowich, 2014), but could also modify their practices regarding specific disciplines (Henessya & Deaneya, 2009; Kersting, Givvin, Sotelo & Stigler, 2010; Santagata & Angelici, 2010).

As implicit representations and mental models are assumed to be invisible, and thus are very difficult to access, the studies mentioned above draw inferences from empirical data such as actions or discourse.

Given this background, the following research questions have arisen: a) how do teaching practices and teaching discourses change after T. E.? b) what inferences about changes in the teachers´ implicit representations and mental models can be drawn from the changes observed in the practices and discourse?

With the purpose of answering these questions, a T. E course was designed as part of teachers´ continuing education. The course served the dual purpose of fostering and developing teachers´ capacities to scaffold children´s narrative production. This choice is justified by the relevance of this capacity for children´s language development (Nelson, 1996), also considered as an important predictor of literacy (Dickinson & Tabors, 2001). In disadvantaged contexts, where access to literacy practices could be limited to school, fostering narrative competence in preschool could be critical for the success or failure at school. In this regard, teaching practices concerning children narrative development are particularly critical.

Based on the results of the studies just mentioned (Dixon & Wilke, 2007; Eilam & Poyas, 2009; Freedman, Bullock & Duque, 2005; Henessya & Deaneya, 2009; Kabilan, 2007; Kang, 2007; Kersting, Givvin, Sotelo & Stigler, 2010; Kucan, 2007; Pareja Roblin & Margalef, 2013; Santagata & Angelici, 2010) the T.E. course was based on a process of reflection-on-action, achieved through a clinical study of the activity (Clot, 2006), that entailed each teacher individually viewing and analysing a filmed recording of his or her practice. This individual activity was combined with group discussion sessions that provided

the theoretical and pragmatic basis intended to promote teachers´ individual analysis and reflection on-action.

10 in-service preschool teachers working in contexts of poverty in Argentina participated in the T. E. course. The first section of this paper explores the changes observed in the personal narrative activities of these teachers, after their participation in the course, with the aim of answering the first question: how do teaching practices and teaching discourses change after T. E.? To answer the second question, in the second section, we carried out a case study of one of the participating teachers in order to infer possible transformations of her mental model that might be related to the transformation of her pedagogical practice.

Answering the aforementioned questions will lead us to focus on the particular relationship between teachers´ assumptions (mental models) and teachers´ actions (practices) and the way both dimensions change after T. E aimed at developing teachers´ awareness.

Method

Participants

Participants in this study included 10 in-service female teachers ages 28-38 years, from two preschools located in marginal urban neighbourhoods on the outskirts of the city of Buenos Aires, Argentina, interested in collaborating with research. After receiving permission from the principal of each school, the researchers sought volunteer participants. The 10 participants had equivalent levels of professional development: all had completed four years of education in early childhood teaching, and each had at least five years of teaching experience.

Each class was made up of 28 to 30 children, aged three to five. The children attending these classes come from socioeconomically disadvantaged families, most of the parents having reached a low level education.

One of the 10 teachers participating was selected for the case study. As this was an exploratory study related to change, we chose the teacher in the group whose practice had undergone the most significant changes in the categories our analysis had highlighted.

Procedure

This study was conducted in three stages: (1) before the course, (2) course implementation, and (3) after the course.
(1)   Before the course:
•   Observations of each teacher's practice (and filming)
•   In depth interviews with each teacher
(2)   Implementation of the course:
•   Individual sessions
•   Group sessions
(3)   After the course:
•   Observations of each teacher's practice (and filming)
•   In depth interviews with each teacher

Teacher Education Course (T.E. course)

The course was designed and implemented with the double purpose of (1) promoting changes in teachers´ implicit representations and practices in relation to children´s narrative competences and (2) studying those changes. The decision to focus on children's narrative competences was grounded in both, the relevance these competences have for children's development within our theoretical frame, namely sociocultural and developmental psychology (Nelson, 1996; Vygotsky, 1988) , and in the analysis of the participating teachers' needs which had shown the lack of attention paid to narrative development by the teachers. To these ends, and in order to favour intra subjective processes of change, group discussion sessions and individual discussion sessions were organized.

The Group discussion sessions: Four 90 minutes sessions were held after the school day, with all 10 teachers, over a two- month period. The activities focused both on providing categories that the teachers might employ to analyse their classes and on analysing filmed situations of 'sharing time' activities. The categories provided and discussed were related to the linguistic and cognitive processes involved in the production of narratives, children´s learning processes and teaching strategies (Nelson, 1996). The course also encouraged teachers´ metacognitive competences: the ability to analyse a) their own interventions in the group, b) their own production processes when narrating, c) the questions they posed in order to guide children´s personal narratives.

The individual sessions: two sessions were held with each participant alone after the school day over a two-month period. These interviews lasted from 25 to 45 minutes and included activities based on a process of reflection-on-action and clinical study of activity (Clot, 2006). Following the procedure outlined by Clot (2006), during the interviews, each teacher viewed the 'sharing time' activity that had been filmed that day with the researcher. Together they analysed the teacher's performance while the children were producing personal narratives. The aim of the activity was to guide the teacher participant into viewing her own practice through the lens of certain cognitive theories (Nelson, 1996). The researcher scaffolded the process of analysis by asking questions focused on aspects the teacher missed that have proved relevant to promote children´s narrative development according to the theoretical and empirical frame that had been presented during the Group Discussion Sessions (Nelson, 1996). Some of the questions were for example: How many children had the chance to retell their personal experiences? Could you describe their narratives? Were they complete narratives? Were they comprehensible? How did you help them to be understood? Which of your questions promoted children´s narrative production? How?

The researcher and the teacher shared their analysis of the same class and together they discussed possible ways to improve the teacher´s practice.

After this first session, each teacher took the transcription of her own filmed class home, to be able to analyse it individually and share this analysis with the researcher in the second individual session.

Data Source

Observations of Teaching Practice

Personal narratives in kindergarten usually take place in a routine called 'sharing time' in which children are supposed to retell their personal experiences at the beginning of school day. In terms of the children's language development, this daily activity is supposed to promote narrative production. Each 'sharing time' situation lasted from 20 to 45 minutes. The

same researcher in charge of the T. E course attended 'sharing time' routines in the classes of the 10 teachers and filmed these activities once before and once after the T. E. course. Altogether, 20 'sharing time' situations were filmed and transcribed, 10 before and 10 after the T. E. course.

Discussions during the Individual and Group Sessions (The T. E Course)

Audio recordings were also made of the two individual sessions in which each of the teachers individually viewed and analysed the video of his or her own 'sharing time' situation with the researcher and the four group sessions where the 10 teachers were present. Each session lasted between 30 to 55 minutes. All this data was transcribed in detail so that it could be analysed.

In-depth Interviews

Individual interviews were conducted both before and after participation in the research experience. Each in-depth interview lasted approximately 90 minutes. The interviews with the teacher selected for the case study were considered for the second part of the study.

Analysis of Empirical Information

Data was collected and analysed simultaneously by two researchers, with an agreement rate of 90%. Disagreements were solved through discussion based on theory and re-watching the footage of participants.

The process of constant comparison (Glaser & Strauss, 1967) employed to analyse the 'sharing time' activities of the 10 teachers allowed to inductively create a system of categories, which was then used to compare the activities before the T. E course with those after the T. E. course. This category system was as follows: Goal of the activity for the teacher, completeness of children´s narratives (Lavob, 1972), responsibility for narrative construction, focus of teacher´s intervention, type of questions, contingence, task distribution, distribution of turn-taking, control of discipline, presence of value judgments (Manrique, 2014).

As it is notoriously difficult to study changes in implicit representations and mental models, the following sources of data were used as indicators for the case study:

a) Actions performed by the chosen teacher and discourse transformation during the 'sharing time' activity (before and after the T.E. course).

b) The teacher´s discourse during the group sessions, during the two individual sessions (while she viewed and analysed the video of her own 'sharing time' activity); and during the in-depth interviews before and after the T. E course.

Content analysis (Krippendorf, 1978) was employed to pinpoint the representations present in the teacher´s discourse during the above mentioned situations, namely, representations regarding

- what a personal narrative is
- what is important about the activity
- what a good class is
- who is responsible for class failure
- children´s psychological features
- what teachers' interventions in class should be.

The results of the analysis of the teacher´s actions and discourse during sharing time activities was compared with the results of the analysis of the discourse during the individual and group sessions, and during the in-depth interviews.

Results

The results are organized in three sections. The first reports on the results concerning the transformations of the practices observed in the whole group of participants. The second section presents the transformations in teachers' discourse in the interviews of one teacher and during the clinical study of activity, in order to analyse and make inferences regarding the process of transformation of the implicit representations that comprise the teacher´s mental model, during the T.E. course. The third section summarizes the results from both the analysis of the teachers´ practices, her actions, and the analysis of one of the teachers´ discourse, to try to make sense about the way her mental model might have been affected.

Changes in Practices

Overall, the results show significant differences in the practices of the 10 teacher participants. Table 1 presents a summary of the analysis of the activities filmed before and after the participation in the T. E. course.

	BEFORE T.E. COURSE	AFTER T.E. COURSE
Goal of the activity for the teacher	Other literacy activities, not narrative production	Narrative production
Completeness of children´s narratives	Only the summary of the narratives (Lavob & Waletsky, 1967) and some details are elicited (when narratives take place). No narrator positioning visible	At least two fully developed narratives (Lavob & Waletsky, 1967) per situation are encouraged. The narrator positioning is explicit
Responsibility for narrative construction	Heterostructured narratives are promoted through teachers´ intervention (responding to the teacher´s interest)	Both heterostructured and autostructured narratives are promoted through teachers´ intervention
Type of questions	Predominantly closed questions – monosyllabic answers	A larger amount of open questions – full answers
Contingence	No contingency in teachers´ interventions.	Contingent replies from the teacher (focus on the child´s interest)
Focus of teachers ´ intervention	On the social vector: assigning turns of talk to as many children as possible, controlling discipline	On the instrumental vector: asking questions to foster the construction, organization and expansion of children´s narratives

Task distribution	Same task assigned to every child: to answer teachers´ questions. Listening is meaningless, the only actively participant child is the narrator. Parallel communication circuits between children are observed	Different task assignments to different participants: the narrator speaks; the others ask him or her questions about the personal experience. Everybody is actively participating. Listening becomes meaningful. Less parallel communication circuits are observed
Distribution of turn - taking	Not assigned. Many children say just a few words	Many are assigned in order to protect the narrator´s turns. Less children speak for a longer period of time
Control of discipline	Difficulty of leadership and class management. Control is kept by the teacher, when it is lost, coercion is employed	Difficulty of leadership remains but control is shared to a degree: the teacher shares the centre of the communication net with the narrator
Presence of value judgements	Yes. This becomes an obstacle to children´s retelling of experiences	Yes. This aspect remains after the T.E. course but only when the personal narratives end.

Table 1: Transformations observed in 'sharing time' activities

The difference between the pre and post 'sharing time' routines meant a change in teachers´ interventions: teachers asked many more questions, showing their interest first to learn more about children´s experiences, through eliciting more complete narratives, second an interest to understand it better, when it was confusing. This change meant that teachers scaffolded children´s narrative production. From the narrative production point of view this meant that while the narratives before the course in general included only the summary, or the summary and the conclusion (Labov, 1972) the narratives after the course included most of the categories enunciated by Lavob (1972) and? (Labov & Waletzky, 1967) as part of every narrative: abstract, orientation, complicating action, evaluation, resolution.

From the social perspective, in the 'sharing time' routines after the course more children´s active participation with different roles was visible, as well as more turns of talk on the children´s part.

After the course children´s narrative behaviour became more autonomous: not only heterostructured but also autostructured narratives took place, showing that children could determine the topics of conversations, as well as teachers. Also, a more democratic distribution of control was found, evident through the quantity of open questions, which increased after the course. Open questions allow the children to choose how to answer and what information to include in their answer. Additionally, in the situations after the course the teachers tended to share the centre of the communication net with the child who was retelling his or her personal experience.

Last but not least, after the course, teachers followed the children´s lead, replying contingently to their comments, thus showing that they respected the children´s point of view in the story, and they only expressed their value judgements, showing their own point of view towards the story, at the end of the narrative. In this way, the narratives were not interrupted by teachers.

The changes observed in the 'sharing time' routines imply a transformation of teachers´ practices, which is closely related to the dimensions of work the T.E. course had tackled. These changes involve a shift in teachers´ approach to cognitive and linguistic development. In general terms, the 'sharing time' routines after the T.E. course entail more opportunities for children´s narrative development.[7]

To explore what underlies the transformation that was observed in teachers´ practices, a case study was conducted to infer changes in one of the teachers´ implicit representations.

Changes in Representations

On analysis, significant changes were observed in the chosen teacher´s discourse during the clinical study of activity (Clot, 2006), and during the interviews before and after the course. The discourse reconfigurations were interpreted as an indicator of the changes that took place in the teacher´s implicit representations and mental model, the way she understands her surroundings and what she focuses her attention on. Table 2 summarizes these changes.

Representations of	BEFORE T.E. COURSE	AFTER T.E. COURSE
What a personal narrative is	Any comment related to the children´s life, even the monosyllabic answer to a teacher´s question	Something that happened to the child that he or she wants to share in depth using words
What is important about the activity	Children´s silence/behaviour/ to listen to one another/ to respect turn taking	For children to express themselves/understanding/sharing ideas
What a good class is	One in which there is silence and children pay attention	One in which children are learning, talking or producing something
Who is responsible for class failure	Children (they are unable to pay attention) / group (the teacher must adapt to the group´s disposition)	The teacher: whatever the teacher does might influence the group´s disposition towards an activity
Children´s psychological features	When they don´t speak, it means they have nothing to say or they are shy/ they only want to call your attention/ they repeat what others say	Children might have difficulties at understanding another´s point of view or a question/they have interesting and original ideas to share
What teachers' (T) interventions in class should be	T´s questions might expose a child´s shyness	T´s questions help children expand their narratives
	T´s role is to talk, mostly and also to listen to the children	T´s role is to listen to the children, take their contribution into account and try to understand what they mean
	T should wait till personal experiences show up spontaneously	T can help children to evoke personal experiences through different means

Table 2: Transformations in one of the teachers´ implicit representations

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[7] It is important to note that in this contribution we refer to "opportunities" for children´s learning. A future study would be necessary to explore the impact of the T. E. course on children´s performance.

Before the course, the teacher´s concept of narrative was not precisely defined: any of the children´s comments was taken as a narrative of personal experience. After the course the teacher was able to discriminate a personal narrative from other genres and she was also able to realize when a narrative was complete or not.

Another change we could observe was the definition of the teacher´s pedagogic expectations: while before the course she valued children´s silence and discipline as the most significant aspect in her class, what she considered the most important dimension after the course was the opportunity for learning she was offering. She addressed especially the possibilities for children to express themselves, to share their points of view.

After the course, the teacher´s representation of the children, of their abilities and of their difficulties changed. While in the interview before the course she made it clear that children had no difficulties when retelling a personal experience and that in general they lacked ideas to share, after the course she stated that she had realized children had interesting and original ideas and experiences to share but they might have difficulties at understanding another´s point of view or expressing these ideas. Considering the children´s difficulties she had become aware of, she redefined her role as that of a 'listener', one who tries to understand what children mean in order to help them be understood by others. She acknowledged that whatever she did might influence the group´s disposition to work and the children´s opportunities to speak and to learn. She stated that her questions, for example could help children expand their narratives, or she could help children evoke personal experiences through different means, such as retelling an experience of her own.

One of the Teacher´s Mental Model: Change in Teacher´s Assumptions and Actions

For the case study, we considered the information provided both by the 'sharing time' activity of the selected teacher before and after the course and the interviews, what the teacher does during the routines and what she says while watching the video and in the interviews. These reflections are what Schön (1987) refers to as her espoused on-action, and in-action mental models. Based on this information, we have tried to infer the way this teacher represents for herself the reality she deals with, the meaning her actions have in her own mental model (Jones et al., 2011) and the way this mental model changed. By this, we are referring to the way she interprets or makes sense of her surroundings, what Schön (1983) calls the teacher´s perspective.

In the activity prior to the T. E course, we observed this particular teacher´s performance was focused on control of discipline. If we consider what she says during the interviews, this attitude seems to be a reactive strategy towards loss of control, related to her need to recover control. In the interview she expresses her distress when children misbehave in class. She says she chooses activities where she will not lose control. Her choices as a teacher are mediated by her distress. This, in part, leads to the emptying of content observed in the activity that took place before the T.E. course, the frequent closed questions she asked and the absence of complete narratives. The children´s lack of both participation and interest gives rise to constant parallel circuits of communication, which the teacher tries to control by permanently interrupting the activity to call children´s attention. The children´s attitude, on the other hand, their lack of interest, may be, in part, related to them not understanding the point of the activity due to this emptying of content. After all, listening to many summaries of different personal narratives must be really boring for the children. None of them could expand their narrative.

In the 'sharing time' routine after the T. E course, even when the teacher still has difficulty managing the class, the goal of the activity is clear for her: she mentions that "*It is*

very important for children to be able to share their points of view, the way they experience events." Having a clear purpose for the activity in terms of children´s learning helps the teacher organize the task and set limits, as was observed in the activity. The teacher´s focus shifted from *controlling* to *organizing* children´s participation. As a result, four fully developed narratives were shared. The narratives were made comprehensible with the help of the teacher´s questions. The children who were not narrating had permission to ask questions to the narrator. Thus, listening became meaningful for them.

The changes observed are related to the teacher ´s intention to retrieve children´s right to speak, which she had expressed as a concern in the first interview ("*I am used to retelling things that happen to me with plenty of details, and I hate it when people get bored or when they don´t listen! And now I realize that is exactly what I´ve been doing with the kids. I am not listening to them; I´m not taking what they say into account*") The 'sharing time' routine changed from a situation in which children were denied the right to express themselves, marked by the absence of meaningful verbal participation and complete narratives, to one in which the children have more participative roles, where the teacher is not the only one who communicates, and where children have a say in the contents of the communication, that is, they can choose what to speak about and their singularity appears in each of their unique experiences.

We would argue that redefining what a personal narrative is and the awareness of its relevance for children´s development, promoted by the T. E course, might have affected the teacher´s perspective and the aspects she focused her attention on during sharing time activities. This changed perspective confers much more importance to children´s participation in class talk. Our claim is that this new perspective the teacher has embraced might be, in part, connected with the change observed in the sharing time activities. The knowledge the teacher has acquired through her participation in the reflection group regarding children's mental processes and their difficulty in accessing some memories, seems to have had an influence over her interventions in class. In the last interview she observes, *"I have started retelling my own personal experiences first to help them remember theirs… Stories also trigger their own personal narratives."*

When we try to answer the question "What has changed after the course?" we realize it is not only what the teacher does, but also the way she interprets the situation, what she pays attention to, her focus, her awareness, the way she values what she does, the relative value she gives to different aspects in the situation. All these dimensions comprise the teacher´s mental model, her perspective. Our claim is that she adjusts her practice within this perspective to match her new expectations of the activity of personal narrative-telling.

Discussion

There were two main purposes to this research. The first one addressed the possibility of change in teaching practices and teaching discourses through teacher education. We examined this, comparing activities before and after participation in a specific T.E. course. To summarize this part of our findings, we identified changes in the 10 kindergarten teachers´ practices regarding personal narratives. The transformation involved not only instrumental aspects, which had been the focus of the reflection group, but social ones too. As others have already pointed out (Doyle, 1983), we observed how these two aspects cannot really be dissociated in classroom activities. In fact, changes to one of the aspects necessary implied adjustments to the other. For instance, in order to allow a child to develop a full narrative, it turned out that it was necessary to 'protect' his /her turns to talk.

The fact that it is impossible to ascertain whether the participating teachers would have made these changes had they not taken part in the course, implies certain limitations to our conclusions. Though we can by no means guarantee the existence of a causal relationship between the T. E course and those changes observed in the study, there are two arguments that suggest there is a connection between them. First, the fact that the changes observed were related to the issues tackled during the individual and group sessions, and not to other aspects of their practice that might have changed, and that all 10 teachers showed changes in the same patterns, though to different degrees. In addition, this new behaviour implied more opportunities for children´s narrative production, which was exactly the goal of the T. E. course. In this sense we conclude that the T. E course has triggered or favoured this change.

In the second place, we might argue that having more than five years of teaching experience, the participants had developed a relatively stable way of going about 'sharing time', based on their academic education and their own practical wisdom. The 'sharing time' activities filmed before the T.E. course can be taken as an example of this 'style' that we are assuming the teachers had developed. The fact that change was observed after presumably years of stability could be taken as evidence that the T.E. course was related to these changes.

On the other hand, even considering this change was connected to the T. E course, we cannot provide any evidence regarding which of the different activities included in the course might be associated with change, the group or the individual sessions, watching the video or talking about it. Considering our assumption that change is related to subjective transformation of mental models, it might well be that the vehicle for change is different for each individual. All these limitations suggest the need for further research.

While acknowledging the limitations of the present study, its contribution to the field cannot be underestimated when the changes that have been identified in teachers´ practices after such a short T.E. course imply broader opportunities for children to exercise, and thus, develop basic narrative competences. Considering the social background of the children in this study, the social relevance of the changes in their learning opportunities must also be taken into account. Most of the children´s parents in the study do not have a secondary level of education, and a linguistic gap has been reported between the linguistic practices at home and those promoted at school (Borzone, 2000). In this background, children depend mostly on school teaching and interaction in class to develop certain discursive practices that seem to play a critical role in the literacy process and, consequently, in academic success (Downing, Olilla & Oliver, 1975).

In relation with the second purpose of our work, the possibility to deduce possible changes to one of the teachers´ mental model, the case study allowed us to infer transformations to one teacher´s implicit representations of what a personal narrative is, what is important, what a good class is, who is responsible for the failure of a class, how teachers should carry out instruction and also regarding children´s psychological features. Together with the changes observed in the way this teacher acted, these changes reveal transformations in this teacher´s mental model. We then assumed that the transformations of this mental model, as a mechanism through which new information is filtered and stored (Johnson-Laird, 1989), seem to have allowed the teacher to interpret, judge, and make other decisions to match that new way of perceiving what was happening. Furthermore, in referring to this changed mental model or perspective, the transformation we are discussing is not only a conceptual one, or one of implicit representations in Pozo´s terms (Scheuer & Pozo, 2006), but also a change in terms of values (as regards what is important), and of expectations (as regards what a good class is and about who is responsible for failure), dimensions Zeichner (1994) and Schussler, Stooksberry & Bercaw (2010) have mentioned.

In this sense, our findings are in line with the studies that have reported that reflection-on-action develops teachers´ awareness (Schussler, Stooksberry & Bercaw, 2010),

that it triggers transformations of teachers´ beliefs and points of view, as well as teacher´s instruction (Dixon & Wilke, 2007; Freedman, Bullock & Duque, 2005; Kabilan, 2007; Kang, 2007; Kucan, 2007; Manrique & Borzone, 2012; Manrique, 2013; Pareja Roblin & Margalef, 2013; Schussler, 2006; Schussler, Stooksberry & Bercaw, 2010). Our findings also show the power of video analysis, that can enable teachers a unique opportunity to review and reflect on their positioning and it can foster changes in practices (Bower, Cavanagh, Moloney & Dao, 2011; Charteris & Smardon, 2013; Danielowich, 2014; Henessya & Deaneya, 2009; Kersting, Givvin, Sotelo & Stigler, 2010; Santagata & Angelici, 2010).

When we look closely upon the transformations in the implicit representations, values and expectations, we notice that these are coherent with the teacher´s in-action mental models, that is to say, what she actually did when teaching. In other words, changes in the teacher´s practices are coherent with a subjective transformation that has modified the three types of mental models: espoused, on-action and in-action. This is evident, for instance, if we consider the teacher´s implicit representation about a good class as one in which children are expressing themselves and the increase in fully developed narratives after the T. E. course.

With regard to the difficulty of accessing implicit representations (Atkinson & Claxton, 2000; Davini, 1995) and changing them (Perrenoud, 2001; Wilke, 2008), in line with other studies (Perrenoud, 2001; Schussler, Stooksberry & Bercaw, 2010), we argue that the reflection-on-action experience during the course might have helped to make representations of the teacher, that had never been questioned before, explicit, thus allowing her to examine and question them. In line with the observations of Henessya and Deaneya (2009), by seeing herself in action in the video, and being able to discuss her performance with someone else, the teacher was able to identify the contradictions between what she stated about her teaching before the T. E. course, what she stated when she watched the video of her class, and what she actually did in class, her on-action, her espoused and her in-action mental models (Schön, 1987). For example saying it was important to listen to the children and seeing in the video she did not do so, before the T. E course might have helped her to redefine what 'listening' meant and adjust her actions accordingly. This new representation of the concept of listening seems to have become part of the perspective through which the teacher evaluated and guided her own practice. It seems to have altered the way the teacher made sense of classroom events and so, the aspects she weighed when making decisions. As Kersting, Givvin, Sotelo and Stigler (2010) have pointed out the influence of T.E over student learning opportunities is thus, indirect: it is the decision making process that is altered through T.E. and, thus instruction. The rest is just a consequence.

An interesting question, that was not originally raised, concerns the order of the transformations. While Scheuer and Pozo (2006) state that it is necessary to change implicit theories first in order to change practices, Pareja Roblin and Margalef (2013) invert this statement, pointing out that introducing changes to practice challenges teachers to revise their personal beliefs. In other words, it is practice that produces changes. With regard to this controversy, our case study has shown that, though reflection-on-action has triggered reflective processes and important insights, it was only when the teacher was able to try out new ideas in class, that she was really convinced and she said "This is it!" The results she obtained with the children in class informed the teacher as much as the group discussions, and what she really trusted in the end was her own experience.

Our claim is thus, that a very dynamic, dialectic process takes place between the teacher´s representations and her practices, which like a spiral, implies a coming and going between the two aspects. The T. E. course seems to have made possible this dialogue and so, the interrelation between reflection-in-action (Schön, 1983), performed during the practice itself in a spontaneous way to allow decision making, and reflection-on- action, which involves a process of analysis of the representations which make up the teacher´s perspective,

after the action itself. It seems to be clear that the process of reflection-on-action has, in this case, influenced the teacher´s process of reflection-in- action, performed during her actions, and, thus, her practice. Her practice, as well, has become a source for more reflection, an instance for trying out new ideas that might, in turn, affect her mental model. The T. E. course seems to have connected both 'worlds', the world of the practices, of school activities and visible actions, and that one of perspectives, representations, mental models.

These results highlight the influence of mental models´ transformation on teachers´ practices and the teaching education potential of courses that address teachers´ reflection-on-action for affecting mental models. It also reveals the value of video analysis to foster reflection.

It seems clear to us that a deeper analysis of the process of change itself related to reflection and to metacognitive awareness is a potentially interesting line of research for future studies.

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