http://dx.doi.org/10.1590/S1413-24782017227034

Towards a more symmetrical approach to the zone of proximal development in teacher education

MICHELE SALLES EL KADRI
Universidade Estadual de Londrina, Londrina, PR, Brazil

WOLFF-MICHAEL ROTH
University of Victoria, Victoria, BC, Canada

ALFREDO JORNET GIL
University of Oslo, Oslo, Norway

ELAINE MATEUS
Universidade Estadual de Londrina, Londrina, PR, Brazil

ABSTRACT
This article focuses on relations between a new teacher and a teacher educator. It draws on the zone of proximal development (ZPD) studies, and the data is analyzed through conversation analysis. Ordinarily, the ZPD is used to theorize the learning that occurs in such a relation in asymmetrical terms. Our case study shows, however, that learning occurs for both participants in the relation, and that the very question of who becomes "the more competent peer" arises from the relation that constitutes a ZPD. Therefore, there are dialectical inversions, whereby the actual roles of teacher and learner no longer coincide with the institutionally designated positions of particular individuals. This then requires an approach to the ZPD that allows for the changes in the relation such that who teaches and who learns is itself the result of the social relation.

KEYWORDS
zone of proximal development; teacher education; coteaching; cogenerative dialoguing.

EM BUSCA DE UMA ABORDAGEM MAIS SIMÉTRICA PARA A ZONA DE DESENVOLVIMENTO PROXIMAL NA FORMAÇÃO DE PROFESSORES

RESUMO

Este artigo foca nas relações interacionais entre um professor novato e uma formadora. Está baseado nos estudos da zona de desenvolvimento proximal (ZPD), e os dados são analisados por meio da análise da conversação. Na literatura, o conceito de ZPD tem sido usado para teorizar o aprendizado que ocorre nas relações em termos assimétricos, entretanto este estudo demonstra que o aprendizado ocorre para ambos os participantes nas relações e que a questão de quem é o par mais competente surge na relação que constitui a ZPD. Desse modo, há inversões dialéticas, em que os papéis atuais de professor e aprendiz não coincidem com as posições designadas institucionalmente aos indivíduos particulares, o que exige uma abordagem para a ZPD que permita mudanças nas relações de modo que aquele que ensina e/ou aprende seja resultado das relações sociais.

PALAVRAS-CHAVE

zona de desenvolvimento proximal; formação de professores; coensino; diálogo cogerativo.

EN BÚSQUEDA DE UN ABORDAJE MÁS SIMÉTRICO PARA LA ZONA DE DESARROLLO PRÓXIMO EN LA FORMACIÓN DE PROFESORES

RESUMEN

Esta investigación se centra en las relaciones permeadas por la interacción entre un profesor principiante y una formadora. Se apoya en los estudios de la zona de desarrollo próximo (ZPD) y los datos son analizados por medio del análisis de la conversación. En la literatura, el concepto de ZPD ha sido utilizado para teorizar el aprendizaje que ocurre en las relaciones en términos asimétricos. Este estudio, sin embargo, demuestra que el aprendizaje sucede para ambos participantes en las relaciones y que la cuestión de quién es la pareja más competente surge en la relación que constituye la ZPD. Así pues, hay inversiones dialécticas en las que los papeles actuales de profesor y aprendiz no coinciden con las funciones designadas institucionalmente a los individuos particulares, lo que demanda un abordaje para la ZPD que permita cambios en las relaciones de modo que aquel que enseña y/o aprende sea el resultado de las relaciones sociales.

PALABRAS CLAVE

zona de desarrollo proximal; formación de profesores; co-enseñanza; diálogo cogenerativo.

INTRODUCTION

> *To paraphrase Marx:* the psychological *nature of man — the totality of societal relations [obščestvennyx otnošenij]* shifted to the inside and having become functions of the personality and forms of its structure *(Vygotsky, 2005, p. 1023, original emphasis, underline added).*

Premised on the idea that all higher functions have been material relations first, Vygotsky's notion of the zone of proximal development (ZPD) has been widely used in educational studies to theorize learning and development that arise from teacher-student relations. In the West, ZPD tends to be thought of in terms of the opposition of a more capable individual (the institutionally designated teacher, parent, or peer) to a less capable one (the institutionally designated student or child). However, interpretations of ZPD in the context of the larger theory of development within it was conceived suggest the need for reconsidering the concept in more symmetrical terms (Roth; Radford, 2010; Veresov, 2004; Zuckerman, 2007). This call for a more symmetrical treatment of the ZPD is based on two observations. First of all, the "more competent individual" (i.e., parent, teacher, peer) also learns and develops over time and may become a better parent, teacher, or more knowledgeable peer. That is, precisely the same social relations that allow a "less competent individual" to learn and develop lead to learning and development of the "more competent individual." Second, the ZPD designates a particular mode of the societal relation between two individuals, which, in and through the relation, have opportunities to learn and develop. But this societal relation, this zone, is not a box in which the individuals find themselves. Rather, the relation is something that the participants endogenously produce in the course of and together with attending to whatever task they pursue.

The societal relation is both a symmetrical and an asymmetrical concept: it involves an inherent difference between participants, but it also implies the mutual transactions between participants that come to constitute it. From this perspective, the societal relation becomes a minimal *unit* of development (Vygotsky, 1986), not an aggregate of interchanges between independent participants. In this way, the societal relation generally and the ZPD more specifically are equivalent to the notion of transaction, which implies the mutual constitution of roles in contrast to the psychological approach that emphasizes self-action and interaction of independent individuals (Dewey; Bentley, 1949/1999). Based on our case study of a teacher educator and a new teacher transacting in a school-based teaching education program, the purposes of this paper were to substantiate and to expand the call not only for a more symmetrical approach of the ZPD concept but also for institutional practices in teacher education programs to be more sensitive of such symmetry. In this approach, {teaching | learning} (i.e., the equivalent of Vygotsky's *obuchenie*) is a modality of the societal relation between two or more individuals rather than a designation of institutional positions. Rather than presupposing that teaching and learning are aligned with institutional positions, the question of who learns and who teaches is itself a situated product of a given societal relation open to empirical study. This approach provides the field with new opportunities for

thinking about learning and development in teacher education specifically and in all societal relations more generally.

In this paper we present results from a two-year study analyzing the transactions among a cohort of new teachers, cooperating teachers and teacher educator in a pre-service practicum program that uses {coteaching|cogenerative dialoguing} as a means for learning to teach (Tobin; Roth, 2006). In our analyses, we show how, in and through the societal relations that characterized an initial asymmetry, in which the teacher educator typically takes the role of the more competent participant, a new relation evolves in which a new teacher eventually becomes the more competent peer in the situation, and in which the teacher educator also evolves and learns as a result of this inversion. Traditional notions of symmetry/asymmetry in ZPD and implications for educational design are problematized in our discussion.

BACKGROUND: ZPD IN CURRENT THEORIZING

The concept of ZPD may well be the most important one that L. S. Vygotsky has left for those interested in teaching and learning (Newman; Holzman, 1993). Despite its notability — or because of it —, the ZPD is also one of the most controversial of Vygotsky's discoveries. The concept was initially defined as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978, p. 86). This definition tends to be taken in simplified terms: as a unidirectional movement in which a less competent individual is assisted in learning an aspect of culturally available knowledge. Development is said to have occurred when the learning individual displays this knowledge without assistance. In mainstream readings, those who employ the concept often reduce learning to knowledge assimilation "in the head" and teaching to knowledge transmission (Roth; Radford, 2010). In these interpretations, the notion of ZPD involves a particular asymmetry, in which there is a differential knowledge that allows knowledge to flow from the more to the less knowledgeable participant in a teacher-learner relation. This asymmetrical treatment of the concept can be easily found in current theorizing within the teacher education field way (e.g., Fani; Gaehmi, 2011). Thus, for example, the term zone of proximal teacher development (ZPTD) has been defined as "the distance between what teaching candidates can do on their own without assistance and a proximal level they might attain through strategically mediated assistance from more capable others (i.e. methods instructor or supervisor)" (Warford, 2011, p. 253).

A number of researchers have critiqued such simplified interpretations for being the result of applying the concept within individualistic frameworks that do not align with the theoretical roots of ZPD. In this regard, ZPD needs to be related to Vygotsky's general law of development, as per the introductory quotation, according to which any higher mental function *was* first a societal relation (Veresov, 2004). Approaching the concept against this background, the societal aspects of any learning situation become the focus. Thus, over the past two decades, a number of

scholars have reconceptualized the notion of ZPD in their attempts to go beyond the individual learner (Engeström, 1987) and on the teacher-centered process of learning that characterizes traditional educational practices (Holzkamp, 1993).

A common aspect of these reconceptualizations is that they conceive the ZPD in terms of its distributed, societal, and relational nature. Thus,

> we should think of the zone as a characteristic not solely of the child or of the teaching but of the child engaged in collaborative activity within specific social environments. The focus is on the social system within which we hope children learn, with the understanding that this social system is mutually and actively created by teachers and students. (Moll, 1990, p. 11, emphasis in original)

An analytical focus in the social system involves conceiving not only learner's development in the ZPD but also the development of all individuals involved in a soci(et)al relation, as well as of the soci(et)al relation itself (Rogoff, 1995).

Other ones have defined the concept of ZPD in terms of the relation between individual and societal development (Engeström, 1987). The traditional perspective on ZPD lacks an articulation of whether and how the activities themselves as societal systemic formations develop and change constantly. A reformulation of the ZPD includes precisely such an articulation: it is "the distance between the present everyday actions of the individuals and the historically new form of the societal activity that can be collectively generated as a solution to the double bind potentially embedded in the everyday actions" (p. 174, original emphasis).

In these reinterpretations of the ZPD, {learning-development} is depicted:

1. no longer as an exclusively positive and unproblematic process of knowledge acquisition, but as a process of confrontation, denial, and reconstruction of cultures that collide;
2. no longer as individual transformation, but as coordination of one-self-with-others;
3. no longer as a vertical movement between planes where the more competent individual pulls the less competent one, but as horizontal movements of border crossing.

SYMMETRY AND ASYMMETRY IN ZPD

A reconceptualization of ZPD in the terms described before bears implications for understanding the symmetry and asymmetry in {teacher–learner} relations that often go unexplored. One of the most interesting position states that there is an inherent asymmetry in the social relation that is defined by a ZPD (Zuckerman, 2007). The author rejects the view of an invariable and hierarchical asymmetry that derives from individualistic interpretations of the ZPD, which "ignore the emotional-semantic unity (mutuality, symmetry) of the relationship" (Zuckerman, 2007, p. 51). Instead, she resorts to a "meeting" metaphor to account for the real asymmetry involved in a ZPD. The implication is NOT that a developed (adult) mind meets an underdeveloped (childlike) mind, but that they are precisely different minds that meet. Zuckerman defines ZPD as

> a place or time of the generation and establishment of interactions of a kind that allow for the possibility of the "meeting" of different experiences, different methods of comprehending those experiences, and different forms of mediation that alienate their material content from their subjective quality. (2007, p. 50)

This asymmetry, however, does not neglect that both individuals involved in the {teaching | learning} relation, evolve together as the relation itself evolves.

In a similar vein, Roth and Radford (2010), drawing on Vygotskian and Bakhtinian ideas, discuss on the symmetry that the word, as the meeting point in the ZPD, introduces into the societal relation. Because the word is always a reality for two, it gives rise to an "intersubjectivity that is grounded in a common world of historical significations and ways of life" (p. 304). Consistent with the idea that all higher psychological functions above all are soci(et)al relations (Vygotskij, 2005), this allows us to understand that there are not only both symmetrical and asymmetrical aspects in the {teaching | learning} situation but also dialectical inversions in which teachers become students and students become teachers, that is, in which the question of who is in the know is itself a result of the relation (Roth; Middleton, 2006). As a result, although relations are symmetrical, "asymmetries are possible because of the existing intercomprehension of interacting participants who become each other's teachers and students independent of their institutional positions" (Roth; Radford, 2010, p. 300). Such an approach allows us to understand why and how teachers learn during the course of their professional experience:

> In each interaction, teachers can find out whether something they have done or said was or was not successful, and whether their subsequent attempts in changing their actions/utterances bring about the appropriate response. (Roth; Radford, 2010, p. 304)

These views on the notions of symmetry and asymmetry potentially may add to our understanding of development in teacher-learner relations.

In this study, we base our use of the ZPD concept on the idea that all higher psychological functions are societal relations first (Vygotskij, 2005), and rely on a dialectical conception of intersubjectivity, which inherently involves symmetry (mutual orientation) and asymmetry (different positions and dispositions in the time-space of the zone). Societal relations are not stable, but evolve over time and, with them, the nature of the relation between people. As a consequence, the roles of teacher and learner themselves result from a continuously unfolding relation. Such relations are produced in and through sequentially ordered turn taking routines (also "interaction ritual chains", Collins, 2004). That is, institutional talk not only is about some content — e.g., debriefing the previous lesson — but also brings to life the societal (institutional) relation. Development (learning) takes place as the movement that results from the tensions between symmetry and asymmetry. In the turn-taking routines (transaction rituals), the roles of individuals are reproduced and transformed by the position that they take in the ordered sequences. The most well-known and best studied of such sequences is

denoted by the acronym *IRE*, because it consists of an *i*nitiation, followed by a *r*eply, and ends with an *e*valuation (Lemke, 1990). In this sequence, the initiating and evaluating positions fall to the teacher, whereas responding position falls to the student. Viewed positively, the IRE sequence can be considered a form of scaffolding that leads to the reproduction of cultural knowledge (Roth; Gardner, 2012); viewed negatively, the IRE sequence is a form of reasserting (a) institutionally sanctioned forms of knowledge, and (b) institutionally sanctioned knowledge/power relations (e.g., Poole, 1994).

METHODS

RESEARCH CONTEXT

This study is an extension of a two-year investigation of one cohort of new teachers enrolled in a Brazilian teacher education program (El Kadri, 2014) based on coteaching and cogenerative dialogues (Roth; Tobin, 2001, 2002). Coteaching is based on the findings that teachers learn to teach in tacit modes by teaching together with others (Roth, 2002). Implemented at the institutional level in teacher education, it is a mode of overcoming the traditional divide between theory and practice, because these new teachers are immediately immersed in the workplace. They are referred to as "new teachers" rather than "preservice teachers", because they are fully integrated in the setting and take full responsibility for teaching and learning. The new teachers learned theory in the cogenerative dialoguing sessions with all other teachers that were present when they discuss their preceding teaching experiences. In our implementation of this model, one or two new teachers (in training) taught English with the regular classroom teacher and the teacher educator. They planned together the curriculum as a whole and all individual lessons. In the cogenerative dialogue sessions, the entire cohort, with the classroom teacher and the teacher educator, debriefed preceding lessons and then decided on how to change their approaches to improve teaching and learning in the classroom.

{Coteaching | cogenerative dialoguing}provides at least three additional advantages (Roth; Tobin; Zimmerman, 2002). First of all, it constitutes an ideal setting for equitable inquiry into teaching and learning processes in which all members (or representatives thereof) of a classroom community may participate putting new teachers in societal relation with experienced teachers in the course of actual teaching praxis. Second, they constitute a research method for studying the learning environment. Third, they constitute a method for dealing with the contradictions created by the traditional separation of theory and research related to teaching. Conceived of as a dialectical unit, {coteaching |cogenerative dialoguing} gives rise to expansive learning, because it realizes the ZPD in the form of historically new forms of activity that arise from collaboration (Roth; Lawless; Tobin, 2000). Studies show that this formation provides opportunities for experienced teachers to learn to teach (Roth, 1998; Roth; Masciotra; Boyd, 1999; El Kadri, 2014), and for teacher educators and researchers of teaching to learn to teach and to learn subject matter (Roth; Tobin; Zimmerman; Bryant; Davis, 2002).

PARTICIPANTS

In this study, we exemplify our findings from the two-year study in the relation between Michele, the teacher educator (and lead author), and Jefferson (one of the new teachers). She directed an 18-member cohort of the teacher education program of Londrina University (Brazil). Because cohort leaders are free to choose a model, Michele offered to implement the {coteaching | cogenerative dialoguing} method. She also served as the field-based supervisor who, consistent with the {coteaching | cogenerative dialoguing} model, taught with the new and regular teachers. Prior to her position at the university, Michele had taught English for 10 years in private schools and subsequently obtained her state teaching certificate. Jefferson was one of the new teachers seeking certification to teach English. Although other participants in the program came with experiences similar to Michele, Jefferson was one of those participants who had no prior experience in teaching. He was not even sure that he actually wanted to be a teacher. The teacher education program provided him opportunities to improve his English language skills. The program was specially funded to provide participants with bursaries — in part as a way of enticing qualified individuals who were already teaching or had other possibilities to obtain a license for teaching in public schools.

DATA COLLECTION AND ANALYSIS

The entire data comprises recordings and transcriptions of the transactions among 18 new teachers, a teacher educator, and a regular school teacher during the two-year of the implementation of a teacher education program in a public school in Brazil. In this paper, we focus on the changing relations between a teacher educator (Michele) and a new teacher (Jefferson), exemplified in episodes from cogenerative dialogue sessions. We began by first culling from the entire 8,000-page data set all those episodes featuring Michele and Jefferson. Because of our interest in understanding soci(et)al relations, we drew on conversation analysis as method (Have, 1999): it allows scrutinizing how these relations are produced in sequentially ordered turn taking. Conversation analysis "seeks to describe the underlying social organization — conceived as an institutionalized substratum of interactional rules, procedures, and conventions — through which orderly and intelligible social interaction is made possible" (Goodwin; Heritage, 1990, p. 283). As an integral part of this four-author collaboration, we drew on interaction analysis, an approach to make sense of the transactions of interest in and through transactions among researchers (Jordan; Henderson, 1995).

WHO IS "THE MORE COMPETENT PEER"? A REVERSAL STORY

In this section, we demonstrate how the relations between a teacher educator (Michele) and a new teacher (Jefferson) played out in cogenerative dialogues during a two-year program in teacher education. The relation evolved from more traditional asymmetric forms, in which the institutionally designated (teacher) educator initiated and evaluated, and the student (teacher) responded, to one in which the roles of teacher and student were subject to the relation. We understand the

relation as a ZPD that itself changes over time such as to allow the roles of teacher and learner itself to emerge from the relation. To theorize how a relation changes from within, we have to allow for its new state already to exist as a possibility within the old state. That is, we have a dialectical situation — two different states existing simultaneously — with an inner contradiction that is descriptive of self-movement, change, and development (Il'enkov, 1977). In this section, we present descriptions of the forms that the relations between teacher educator (Michele) and new teachers took — exemplified here in the relations with Jefferson — in the early and late parts of the two-year program. Although initially asymmetrical, reproducing the typical IRE ritual, these relations need to be conceived as harboring the possibility of the subsequent relations, and therefore in terms of inner contradiction and self-movement.

ASYMMETRY IN TEACHER EDUCATION

The concept of a relation presupposes symmetry in the sense that it always takes two persons to engage in — relations are reciprocal. This is so in institutional relations of individuals hierarchically placed differently such that "the subject who knows, the objects to be known and the modalities of knowledge must be regarded as so many effects of these fundamental implications of power-knowledge and their historical transformations" (Foucault, 1979, p. 27-28). Power is an effect of a relation "rather than a privilege one might possess" (p. 26); similarly, who is the more knowledgeable is an effect of a relation (Roth; Middleton, 2006). Thus, "power and knowledge directly imply each other," because "there is no power relation without the correlative constitution of a field of knowledge" (Foucault, 1979, p. 27). In schools, the turn-taking rituals involving students and teachers tend to be asymmetrical with power and knowledge falling to the teacher as a result of the very same transaction rituals. The IRE pattern is a typical way in which transactions take place in formal educational settings (e.g., teacher education programs), resulting in the control on the side of the teacher.

During the first half of the first year, the relations between the teacher educator and supervisor Michele and the new teacher Jefferson were quite asymmetrical. In their turn taking, imitating and questioning tended to fall to Michele and briefly responding fell to Jefferson. Although the meetings were marked to be cogenerative dialogues, in which all parties contribute to the sense making by initiating dialogue, posing questions, coordinating discussions, and evaluating ideas (Roth; Tobin, 2002), these actions tended to fall to Michele. Typically, she directly addressed the new teachers and their transactions followed a classical IRE pattern. The following fragment from our transcriptions exemplifies the transaction rituals during the first part of the first year of the program.

FRAGMENT 1

|I>01 Mi: Jefferson is so quiet today, aren't you going to give your
| opinion on how you want to be evaluated?
|R>02 Jef: Ah, evaluate the resourcefulness.

|E>03 Mi: Great.
|I> How do we write that? Performance, maybe? Let's put it
| and then we decide for a better term. You mean everything,
| like voice?
|R>04 Jef: Yeah.
((Everybody talks at the same time.))
|I>05 Mi: Pedagogy itself?
|R>06 Jef: Maybe it is more important...
|Ir>07 Mi: Maybe?
|R>08 Jef: Because [the students] have the material and everything, but
| if they do not have measure/tact [compasso] I think it does
| not work, right?
|E>09 Alice: It is true.
|E>10 Mi: Cool, Jefferson, very good.
|I> Come on, talk to us, it is great this issue too, I think what you
| are talking about is didactic transposition, right? For example,
| you know the content, but what do you do in order to explain
| it, to delivery it for the students, one thing is to know the
| content, the other one is how to explain it.
|R>11 Jef: ((Jefferson nods)) For me I think it is difficult to express myself
| in the classroom, you get it, with all that.
|E>12 Mi: Cool, you are saying something that is difficult for you.

In this fragment, we observe five initiations (turns 1, 3, 5,7, 10) — the one in turn 7 initiating a repair or elaboration —, and three evaluative turns (turns 3, 10, 12). All of these fall to Michele. All of the reply turns fall to Jefferson (turns 2, 4, 6, 8, 11). In fact, he is explicitly invited to take the next turn (turn 1). In this transaction ritual, therefore, the roles are distributed in an asymmetrical manner, but consistent with institutional relations. Michele and Jefferson come to be reified as the supervisor and supervisee, respectively. Jefferson is the one who provides the material that is evaluated. It is not that Michele enacts power to which Jefferson is subject(ed). We observe a societal relation *sui generis* that is coproduced in the way in which turns are taken. Despite the articulated intention of instituting cogenerative dialogue, the two contribute to reasserting the institutionally sanctioned forms of power/knowledge relations. Here, it is not differential knowledge that leads to differential power, but rather the way in which the relation plays out effectuates the differences: the teacher educator controls the transaction, initiating and evaluating the "student teacher's" utterances.

The transaction ritual plays itself out almost despite the individual intentions. In fact, as a societal phenomenon *sui generis*, the relation cannot be explained by drawing on individual intentions. This would reduce, in a contradiction of terms, an irreducible social phenomenon to the individual. Rather, Michele initiates because Jefferson does not; and Jefferson does not (have to) initiate because Michele does. In analogy to the speech act discussed by Luria (1976), this sets in movement a "kinetic melody" with a particular form (structure) that unfolds on its own.

Although this transaction was set to be a cogenerative dialogue meeting, the positions speakers took are still asymmetrically distributed and do not yet provide many opportunities to cogenerate. The transaction so far presented presents traces of monologically organized instruction (Nystrand *et al*., 1997)and of the magistral dialogue (Cheyne; Tarulli, 2004), in which the relationship that stands as a model is asymmetrical and hierarchical. This asymmetry is enacted in and as the IRE sequence: the predominance of turns initiated and evaluated by the teacher and the lack of questioning, curiosity and interest from new teacher (Cheyne; Tarulli, 2004). The relation has not (yet) evolved to a symmetrical transaction in the turn-taking pair: the teacher educator is placed in the leading position — as she is the only one evaluating —, whereas the new teacher in training in the responding position. Thus, the cogenerative nature of the situation is not defined by the intention by which the setting was designed, but rather by the actual unfolding of the societal relations as these play themselves out. However, the "seed" for allowing the transactions to be otherwise is there due to the organization of the transactional space in cogenerative dialogues: the relation of an invitation | acceptance sequence opens up spaces for the participation of another to be other-oriented and to the reciprocity of roles that Michele and Jefferson were taking.

Development and change take place through the course of time. Fragment 2, extracted from the end of the first year of the program, presents an episode in which the cohort discusses a text about the teaching of reading and exemplifies the transactional form that was emerging from the continuous participation in cogenerative dialogues. Although the initiation still falls onto Michele, there is no evaluative turn, but rather further initiation to open for further responses and an opening for commenting and elaborating (turn 5).

FRAGMENT 2

|I>01 Mi:	And what was your first impression, what did you ((addressed
|	to all the participants)) think of it? Why are we reading it?
|R>02 Jef:	To understand, eh, how do we say?
|Ir>03 Mi:	What? I did not get it, Jefferson.
|R>04 Jef:	To know if we are applying, we are working with reading,
|	to see if there is something else we could do–
|I>05 Mi:	((Signaling yes)) who else? Who are going to complement
|	what Jefferson just said? Is this why we are reading it?

Here we observe a (slight) change in the transaction ritual. Jefferson accepts and takes a turn without specifically being invited. Turn 5 invites the participation of others as well. By the very fact that initiation consistently fell to Michele, the transaction ritual remains asymmetrical even though specific invitations for turns and evaluative turns have disappeared. That is, we observe a change in the transaction ritual; and this new form is already a possibility when the old ritual was in place. The very relation, however as truncated and asymmetrical as it was presented in the previous sequence, provided for the relation to evolve and, therefore, for new individual agencies to emerge. Only by participation, one learns how to participate

in new and productive ways, whether one participates as teacher educator or as new teacher.

These two fragments show that, although {coteaching | cogenerative dialoguing} is conceived as a symmetrical ZPD (Roth *et al.*, 2000), what actually is going to happen is the result of relations and the transaction rituals that establish them and not the enactment of assigned modes of participation. In the present instance, what was conceived of as a cogenerative dialoguing session and as a symmetrical ZPD was enacted in a highly asymmetrical way. Because a relation is a collective phenomenon *sui generis* — as made salient in the worn phrase that it "takes two to dance" — neither party can be attributed the blame. All participants contributed to producing the relations in and through their place in the transaction ritual. However, precisely because there is a societal relation realized in and through dialogue, different forms of transaction rituals are possible.

WHO IS IN THE KNOW? "THE COMPETENT PEER" EMERGES FROM PRAXIS

The kind of transaction rituals so far enacted in the joint actions of Michele and Jefferson have been seen by educational researchers as a force that works against reflexive education. Researchers sometimes state that the IRE structure is not the best way to facilitate the goal of increasing student understanding of curricular topics and that it reinforces the asymmetry in the classroom (e.g., Candela, 1994). However, in this study, we found instances in which an initial IRE pattern contributed to the development of individuals in the ZPD, as the pattern itself developed with the participants. Taking a dialectical perspective, it is possible to see this development as a transactional achievement with both local and historical implications. From this perspective, transaction rituals are not static in nature, but include the seed for development. The roles of individuals are reproduced and transformed in and through the position that they take in the ordered sequences. In the case here presented, these sequences result in a reversal of who learns and who is in the know, allowing the more competent peer to emerge from praxis — and not from their formal institutional positions. Our data exhibit show, toward the end of the two-year program, the transaction rituals evolve to a relation in which each participant may become the teacher of others. The inverted relation (teachers become students and students become teachers) is a relation in which the competent peer emerges from praxis, a result and part of the history of relations that constituted this particular learning trajectory.

The relations played out at this point constitute a reversal story in which not only individuals but also the nature of cogenerative dialogues change. Individual development is integral to societal (i.e.,transaction rituals) development: both the new teacher and the teacher educator learn how to participate by participating in the very relation. Through their joint action, Jefferson and Michele's relations are transformed as they both engage in a manner that is other-oriented. The relation played out in the following episode is indicative of the reversal of who is in the know and it exemplifies new forms of participation in cogenerative dialogue meetings: the new teacher drives the process of teaching and learning and, therefore, becomes the "more competent peer."

FRAGMENT 3

I>01Mi:	No, I understand your frustration and I think that we have to talk about it. But thinking like that "What can we do," right? Otherwise, we end up again in the language of the critics all the time, right. "They [the teachers] do like that"... "they," "they" all the time. "It is not me." And what about me, in their position, with all those students, what we were going to do? Sandro was the only one who gave an idea here, that would be talking to the teachers, ((Jefferson attempts taking a turn)) to the coordination. What else? Sorry. Say, Jefferson...
R>02 Jef:	I just wanted to comment on what Aline talked about [the other day], that they ((the students)) criticize... she said there was criticisms from the teachers there, right... it ends up being what I saw in the paper, like that, they want to educate new critical citizens. When the criticism is on the school then it is all wrong, you can do it...
03 Mi:	I thought it was so nice... I even talked about it with Denise, what you had told me, Jefferson.
04 Jef:	The student is critical until he criticizes the school...
05 A:	until it gets to the teacher...
06 Mi:	Uh, if he criticizes the school or the teacher he–
07Jeff:	Yeah, because it is like that, the teacher is never wrong, right? If the student is not paying attention is because he is lazy, if the student does not do anything is because he does not want to know... but it is not because the subject is sometimes boring or because the teacher is not approaching it right.
08 A:	Yeah, it is like that teacher, right... they have a problem with her... It is personal. They do not like her, they have a problem, I do not know what...
09 Jef:	Yeah, because– There are 30 students who do not want to learn? Like, how is that possible, right? Like, because there are classrooms that with one teacher everybody goes, and then when comes another teacher, everybody gets dispersed...
10 A:	Yeah.
11 Jef:	but the teacher never sees, like, he is being the problem... like, it is always the classroom, like that, he is perfect. His class is perfect, he gives everything for everybody, he– and nobody wants to learn...
12 A:	Yeah.
13 Jef:	and then he, like, criticizes the schools, he is a rebel, he is in that teenager phase, he just wants to be rebelled, teenagers do not want anything.

Unlike participation patterns described in the previous sections, this situation exemplifies a shift in the participants' positions from an initial asymmetry to a more symmetrical relation in regard to the institutionally sanctioned positions of teacher and learner. In this fragment, we observe six initiations falling to Jefferson (turns 2, 4, 7, 9, 11 and 13), and the participation of another new teacher with four replies (turns 5, 8, 10 and 12). One evaluation turn (turn 3) and one interruption (turn 5) fall to Michele. Here, the roles are distributed in more symmetrical ways that do not coincide with the formal institutional positions of participants. The IRE pattern typical of earlier transactions has evolved to a kind of transaction ritual in which:

1. there is a decreased number of turns taken by the teacher educators;
2. a more equitable distribution of turns between the participants;
3. the harmonic presence of different points of view taken as valid;
4. interruptions;
5. more involvement of the new teacher in the issues discussed, as well as the implications for the process of teaching/learning;
6. more interrelation between practical experience and theoretical knowledge.

Initiating and controlling here fell to Jefferson, which confirms previous findings that learners take more active positions in the educational process as their voices become more informed (Cheyne; Tarulli, 2004). The magistral dialogue identified in the first transactions has turned now into a Socratic dialogue as the new teacher takes a more active role in the educational process.

Jefferson's role as a "new teacher" has turned from a peripheral to a more central position, in which he ended up teaching the others — including the teacher educator — how to understand notions of indiscipline in education from a different perspective. Simultaneously, Michele's role of "the more competent peer" has also changed. In the sequence, Michele's initiation instance arises out of an acknowledgement to someone's else frustration, rather than following an evaluation (turn 1), and do not lead to the next turn by means of a self-produced, magistrally prescribed invitation, but, in this case, such invitation is rather elicited by Jefferson's contribution. Similarly, evaluation turns (turn 3) here do not lead to a next-turn teacher educator initiation, but to Jefferson's further articulation on the topic at hand. Interestingly, the discussion is symmetrical not only at the level of content: what is taught/learned are also positions and dispositions on how participants place themselves in the discussion. In the Socratic dialogue, control shifts to a more directive and active second voice (in our case, the new teacher), one that requires a modification of the stance of the first voice (the teacher educator). The Socratic dialogue in its "radical form" opens the floor to reciprocity of roles within cogenerative dialogues. The hierarchically structured relations of expert and novice characteristic of the magistral version of the ZPD (as shown in Fragment 1) have given way to a relational structure that is characterized by a greater mutuality of participation (Palincsar, 1986).

Again, we observe a societal relation *sui generis* that is coproduced in the way in which turns are taken, but in a reversed way: instead of reasserting the institutionally sanctioned forms of power/knowledge relations as exhibited in Fragment 1, but both — through the transaction ritual that now takes place — coproduce the

new relations: Jefferson initiates because Michele does not, and Michele does not initiate because Jefferson does. That is, Jefferson (as well as the other new teacher in this episode) is enabled to contribute because of the space that the teacher educator contributes to opening. In turn, Michele opens the space for Jefferson to contribute as (and not because or before) he orients and positions himself in the relation. In the new relation, Jefferson is (re)positioned as actively engaged and no longer in the "margin." The transactional rituals move him from a marginal position to a more legitimate central role (Lave; Wenger, 1991). To the extent that Jefferson asserts himself and enacts an emerging agential identity in unpredicted and challenging ways in the Socratic dialogue, Michele's role is decentered, and her identity as a teacher educator becomes sensitive to the new role of Jefferson as she expands her ways of social functioning. The shift can be seen both as contingent with respect to the local situation, and as part and result of the historical development of the relations enacted along the teaching program. This has implications for the ways in which notions of power and knowledge are to be understood in societal (here educational) development. Who is in the know and who learns is a transactionally and contingently achieved product as participants engage with each other (Roth; Radford, 2010). It is in and through their societal relation that the participants aligned themselves in other-oriented ways. At the same time, new transaction rituals emerged *within* and *as* institutional practices. The practices observed towards the end of the program are distinct, yet developmentally related to the initial transactional patterns, and do constitute an instance of teacher education as institutional practice. Societal and individual change, thus, stand in a dialectical relation and become the minimal unit for understanding development.

TOWARD A MORE SYMMETRICAL APPROACH TO THE ZONE OF PROXIMAL DEVELOPMENT

The purpose of this study was to focus on relations between a new teacher and a teacher educator as these played themselves out in the course of a two-year study of a teaching education program in which {coteaching| cogenerative dialoguing}was implemented. In this two-year program, {coteaching| cogenerative dialoguing} proved useful for developing the new teachers' agency and professional development. The way the ideas regarding in/discipline were being put forward in the last fragment — exhibiting a new pattern of transaction — demonstrates how cogenerative dialogue meetings open the floor to examinations of the ideas of (all) teachers. However, our study shows that the cogenerative nature of such meetings is not merely given by the set up, but rather emerges in and through the unfolding of societal relations. Individual development could not be explained by any kind of transaction from the more knowledgeable to the less knowledgeable participants in the relation; it was part and result of the societal relation as the minimal unit, which also develops. Such observation bears implications for the way in which asymmetries between teacher and learners (teacher educator and new teacher in our study) are theorized in traditional approaches to the notion of ZPD.

The notion of ZPD is frequently discussed in terms of an asymmetry between a more capable and a less capable participant in transaction, in which learning occurs

as the less capable participant converges towards mastering of the other's capabilities. This way of approaching ZPD, as discussed in the introduction section, is at odds with current readings of Vygotsky's and cultural-historical theory, according to which the minimal unit of development is not individual, but collective. Our findings, however, as well as recent discussions on the matter (Magalhães, 2009; Roth; Radford, 2010; Zuckerman, 2007), suggest the need to reconceptualize notions of symmetry and asymmetry regarding teachers and students' role.

In this study, we focus on the relations between a teacher educator (Michele) and a new teacher enrolled in the program (Jefferson) as but one example of the kind of developments observed along the two-year program. Our analyses show how, out of an initial IRE ritual, the participants re/produce new forms of knowledge/power relations that do not coincide with their institutionally designated positions. As the actors come to be tuned to each other, more cogenerative forms of relations evolved where a more capable subjectivity emerged from intersubjectivity. Like this, the "traditional role of the more competent individual" emerges from praxis and both participants learn and develop over time together with the activity. It means that the primary asymmetry resulting from the social distribution of cultural knowledge was submerged in a symmetrical space where the participants' consciousnesses connect. Such a connection requires the appearance of a form of intersubjectivity in which historically new forms of activity are created.

Through such relations, a new form of collective responsibility and consciousness arose for both Michele and Jefferson: both learned how to tune themselves to each other to make the transaction occur in more productive ways for both of them. The emergence of a new form of collective consciousness, something that cannot be achieved if we act in solitary fashion, is the most important aspect of the ZPD (Roth; Radford, 2010). Here, this was not only exemplified as a new form of participation and transaction between a teacher educator and a new teacher, but also in the development of the activity as a dialectical unit itself. The new form of consciousness afforded new opportunities for both teaching and learning. The ZPD that is created in and through their encounters implies not only an asymmetry, a difference in their positions as participants of that transaction, but also a symmetry. It was when the object of knowledge appeared simultaneously in Michele's and Jefferson's consciousness that learning occurred. It was by participating in praxis in the transaction with new teachers that the teacher educator learned how to create cogenerative dialogues. This is possible "because it is the unfolding and unpredictable connectivity that is allowed by the social evaluation of utterances and intentions that ties together, in a reciprocal manner, the participants in a symmetric space of *inter*-action" (Roth; Radford, 2010, p. 304).

In this interpretation of the developmental episodes analyzed, intersubjectivity is the precondition for development. This implies that the participants orient themselves towards each other within the zone. It can be accomplished through language and other semiotic means and given the willingness of the participants to orient towards the other. This mutual orientation also implies contributing to the enactment of collective responsibility. This assertion is fully in line with recent calls for a more symmetrical treatment of the concept of ZPD (Roth; Radford, 2010). It is also in

line with Zuckerman's (2007) metaphor of the "meeting" of differences, which makes thematic the inherent asymmetries involved in ZPD. In our argument, these inherent (and necessary) asymmetries are not neglected, but seen in dialectical relation to the symmetrical nature of the kind of social encounters that may lead to development.

Arguing for a more symmetrical approach to ZPD also means to recognize the need of praxis where all participants learn simultaneously. In the case of teacher education, as our analysis show, it was only by participating in praxis that both new teacher and the teacher educator learned how to create cogenerative dialogues and develop new identities. Learning then is better understood in terms of relations between these mechanisms and individuals. Thus, "it is the unfolding and unpredictable connectivity that is allowed by the social evaluation of utterances and intentions that ties together, in a reciprocal manner, the participants in a symmetric space of *inter*-action" (Roth; Radford, 2010, p. 304). It is this willingness to tune ourselves to others, to commit to a common cause, and to engage in manner that is other-oriented that allows learning to occur in such environments.

In our analyses, we see IRE as instituting a form of asymmetry — the new teacher and teacher educator positions in teaching practicum field — and a form of symmetry, in which participants orient to others in a game of language. It is through these relations and the constant opening up for opportunities to engage and assume the collective responsibility at the same time decentering themselves from institutional roles that it might be possible. The societal relations that characterize any transactional space also develop along with participants' development. In our study, the cogenerative dialogue meetings constituted such a space, because these presupposed the unique understandings and experiences of each participant (Wassel; Lavan, 2009). Consequently, it would be expected that all participants were enacting an equitable approach to making sense and generating and understanding of praxis (Roth; Tobin; Zimmerman, 2002b). However, it was through the development of transactions and the actual unfolding of the dialogue, the relations and the engagement of participants, that the cogenerative nature of the meetings was enacted, allowing the development of individuals and the praxis itself. Their relations were changed as the transactional form of the traditional educational settings, in which teachers were considered to be experts who are supposed to lead, and students, on the other hand, are expected to follow were also being modified.

The possibility of a pre-service teacher or teacher educator of keeping and transforming his or her position is dependent on the kinds of opportunities to which s/he has access, and which s/he embraces during joint activities (Lipponen; Kumpulainen, 2011). Considering that agency involves the power to re/define action, problematize choices, propose alternatives, and take decisions, it is also through time that intersubjectivity, trust, and commitment are developed within collaborative praxis (Mateus, 2009a). These opportunities exist in the very concept of transaction. As the teaching practicum unfolded, a ZPD developed such as to give raise to new forms of mutual growth. In this sense, ZPD can also be understood in terms of the relation between individual and societal development (Engeström, 1987), which distances us from the focus on the teacher-centered process of learning (Holzkamp, 1993) and understand the ZPD as a symmetrical perspective.

IMPLICATIONS FOR TEACHER EDUCATION PROGRAMS

In this paper, we present case materials from a teacher education program organized according to the {coteaching | cogenerative dialoguing} model. Based on our results, we are convinced of the need to take a more symmetrical approach to the ZPD. As shown here, the ZPD is a transactional, joint achievement that allows the more competent peer to emerge from praxis irrespective of institutional positions. The symmetry in the ZPD, therefore, implies the possibility of all participants to become teachers and learners simultaneously. Considering this perspective, however, has implications for teacher development in teacher education programs, both theoretically and in practical terms.

From an ontological perspective, it sheds light on {teaching | learning} (*obuchenie*) as an ongoing process of knowing, transacting, being, and transforming, with significant others. That is, symmetrical approaches to the ZPD are congruent with notions of activity as networks of social practices, ideologies, power relations, and discourses dialectically interconnected and irreducible. From an epistemological viewpoint, it opens up opportunities to integrate multiple ways of capturing the semiotic aspects of societal transformation. Considering {teaching | learning} as situated, transactional achievement of societal agents whose powers to act are enabled and constrained by societal structures and practices, the relevant communities, the historical and emergent divisions of labor (Fairclough, 2003), broadly transactional and structural perspectives on semiosis and activity are both desirable and necessary. This perspective brings new implications and possibilities for thinking about the ZPD.

Practically, a more symmetrical approach to the ZPD is consistent with the concept of *praxis*, that is, the recognition that teachers learn while teaching and reflecting on it. It allows researchers not only to think of lifelong learning for teacher educators (who learn at work) but also to conceptualize how new teachers learn to teach by teaching. It helps thinking beyond the asymmetry of institutional positions of teachers and students in different levels. In the context of collaborative teacher education programs, for example, the forms of expertise of new teachers or schoolteachers are essential elements for changing dynamics of power and for legitimating other forms of knowledge.

This perspective for conceptualizing the ZPD leads to a new way of theorizing the novice/expert distinction. Since the more competent peer or the expert emerges from praxis, the static notion of these concepts is no longer appropriate. The novice/expert distinction varies according to the symmetrical or asymmetrical relationships that are playing themselves out. Since the distinctions between novice and expert and between who is in the know and who is not are a result of transactions, these concepts do not apply for truly collaborative environments. In this sense, our research concurs with other studies (e.g., Reilly, 2008) concerning the need to expand the notion of *expert* into the realm of collaborative and socially shared expertise. This is so because expertise needs not be embodied in a single individual: it can be collectively created through joint action. Collaborative contexts in teaching education programs may therefore challenge the privileging of the knowledge of teacher educators.

Here we propose thinking about ZPD as emerging from transactions while participants create the potential for becoming-with-the-other. This also means emphasizing the importance of more dialogical transactions in which different individuals with particular experiences, knowledge and dispositions are placed as central to the well-being of the particular praxis. Understanding the ZPD symmetrically comprises and contributes to the assertion that teacher knowledge is inherently situated and mediated within transactions. It also leads to the recognition that approaches for teaching education based on Vygotskian ideas are productive because these challenge the historical transmissive aspect of teaching (Edwards, 2005; Warford, 2011). Thus, we encourage teacher education programs to place the teaching practicum within contexts that promote dialogue and the development of relations between teacher (new teachers, schoolteachers and teacher educators). This is so because one cannot educate teachers for dialogue outside dialogical praxis and cannot break away privilege and power relations outside praxis of legitimation (Mateus, 2009b). It is therefore important to foster contexts for the development of relations that foster teacher educators to research and understand their own learning as new teachers also learn.

REFERENCES

Candela, A. Student's power in classroom discourses. *Linguistic and Education,* v. 10, p. 139-163, 1994.

Cheyne, A.;Tarulli, D. *Dialogue, difference, and the "third voice" in the zone of proximal development*, 2004,Available from:<http://webpages.charter.net/schmolze1/vygotsky/bakhtin.html>.Cited: 22Sept. 2012

Collins, R. *Interaction ritual chains*. Princeton, NJ: Princeton University Press. 2004.

Dewey, J.; Bentley, A. F. Knowing and the known. In Handy, R.;Hardwood, E.E.*Useful procedures of inquiry.*Great Barrington, MA: Behavioral Research Council. 1999, p. 97-209.(First published in 1949).

Edwards, A. Relational agency: learning to be a resourceful practitioner. *International Journal of Educational Research*, v. 43,p. 168-182, 2005.

El Kadri,M. S. English language teachers changing'identities in a teaching practicum: Pibid and {co-teaching|cogenerative dialogue} as opportunities for learning. 2014. 320 p. Thesis(Doctorate Degree in Language Studies) – UEL, Londrina.

Engeström, Y. *Learningby expanding*: An activity-theoretical approach to developmental research.Helsinki, Finland: Orienta-Konsultit, 1987.

Fairclough, N. *Analysing discourse:*Textual analysis for social research. London, UK: Routledge, 2003.

Fani, T.; Ghaemi, F. Implications of Vygotsky's zone of proximal development (ZPD) in teacher education: ZPTD and self-scaffolding. *Procedia—Social and Behavioral Sciences*, v. 29, p. 1549-1554, 2011.

Foucault, M. *Discipline and punish:* Birth of the prison. New York, NY: Vintage Books, 1979.

Goodwin, C.;Heritage, J. Conversation analysis. *Annual Review of Anthropology*, v. 19,p. 283-307, 1990.

Have, P. *Doing conversation analysis:* A practical guide. London, UK: Sage, 1999.

Holzkamp, K. *Lernen:* Subjektwissenschaftliche Grundlegung [Learning: A subject-scientific foundation]. Frankfurt, Germany: Campus, 1993.

Il'enkov, E. V. *Dialectical logic:* Essays on its history and theory. Moscow, Russia: Progress Publishers, 1977.

Jordan, B.; Henderson, A. Interaction analysis: Foundations and practice. *Journal of the Learning Sciences*, v. 4,p. 39-103, 1995.

Lave, J.; Wenger, E. *Situated learning:* Legitimate peripheral participation.New York, NY: Cambridge University Press, 1991.

Lemke, J. *Talking science:* Language, learning and values. Norwood, NJ: Ablex, 1990.

Lipponen, L.; Kumpulainen, K. Acting as accountable authors: Creating interactional spaces for agency work in teacher education. *Teaching and Teacher Education*, v. 27, p. 812-819, 2011.

Luria, A. R. *The working brain*. New York, NY: Basic Books, 1976.

Magalhaes, M. C. C. O método para Vygotsky: A zona proximal de desenvolvimento como zona de colaboração e criticidade criativas. In Schettini, E. H; Damianovic, M. C.; Hawi, M.M.; Szundy, P. T. C.(Orgs.). *Vygotsky: Uma revisita no início do século XXI*. São Paulo: Andross, 2009.p. 53-78.

Mateus, E.Práxis colaborativa e as possibilidades de ser-com-o-outro [Collaborative praxis and the possibilities of being-with-the-other]. In Schettini, E. H; Damianovic, M. C.; Hawi, M.M.; Szundy, P. T. C. (Orgs.). *Vygotsky: Uma (re)visita no início do século XXI*.São Paulo, Brazil: Andross, 2009a. p. 17-52.

_____.Torres de babel e línguas de fogo: um pouco sobre pesquisa na formação de professores de inglês [Towers of Babel and tongues of fire: A few thoughts about research in English teachers' education]. *Revista Brasileira de Linguística Aplicada*, v. 9, n. 1, p. 307-328, 2009b.

Moll, L. C. Introduction. In Moll, L. C. (Ed.), *Vygotsky and education: Instructional implications and applications of sociohistorical psychology*. New York, NY: Cambridge University Press, 1990, p. 1-27.

Newman, F.;Holzman, L. *Lev Vygotsky: revolutionary Scientist*. New York, NY: Routledge, 1993.

Nystrand, M.;Gamoran, A.;Kachur, R.;Prendergast, C. *Opening dialogue*: Understanding the dynamics of language learning in the English classroom. New York, NY: Teachers College Press, 1997.

Palincsar, A. S. The role of dialogue in providing scaffolded instruction. *Educational Psychologist*, v. 26,p. 73-98, 1986.

Poole, D. Routine testing practices and the linguistic construction of knowledge. *Cognition and Instruction*, v. 12,p. 125-150, 1994.

Reilly, R. C.Is expertise a necessary precondition for creativity? A case of four novice learning group facilitators. *Thinking Skills and Creativity*, v. 3,p. 59-76, 2008.

Rogoff, B.Observing sociocultural activity on three planes: participatory appropriation, guided participation, and apprenticeship. In Wertsch J.;Del Rio P.;AlvarezA. (Eds.), *Sociocultural studies of the mind.*Cambridge, UK: Cambridge University Press, 1995. p. 139-164.

Roth, W.-M. Science teaching as knowledgeability: a case study of knowing and learning during coteaching. *Science Education*, v. 82, p. 357-377, 1998.

_____.*Being and becoming in the classroom*. Westport, CT: Ablex, 2002.

Roth, W.-M.; Gardner, R. "They're gonna explain to us what makes a cube a cube?" Geometrical properties as contingent achievement of sequentially ordered child-centered mathematics lessons. *Mathematics Education Research Journal*, v. 24, p. 323-346, 2012.

Roth, W.-M.;Lawless, D.;Tobin, K.{Coteaching | cogenerative dialoguing} as praxis of dialectic method. *Forum Qualitative Sozialforschung/Forum Qualitative Social Research*, v. 1, n. 3, 2000.Available from:<www.qualitative-research.net/index.php/fqs/article/viewArticle/1054>.Cited 5 Sept. 2012.

Roth, W.-M,;Masciotra, D.;Boyd, N. Becoming-in-the-classroom: a case study of teacher development through coteaching. *Teaching and Teacher Education*, v. 15, p. 771-784, 1999.

Roth, W.-M.; Middleton, D. The making of asymmetries of knowing, identity, and accountability in the sequential organization of graph interpretation. *Cultural Studies of Science Education*, v. 1,p. 11-81, 2006.

Roth, W.-M.;Radford, L.Re/thinking the zone of proximal development (symmetrically). *Mind, Culture, and Activity*, v. 17, p. 299-307, 2010.

Roth, W.-M.;Tobin, K. Learning to teach science as praxis. *Teaching and Teacher Education*, v.17, p. 741-762, 2001.

_____. Redesigning an "urban" teacher education program: An activity theory perspective. *Mind, Culture, & Activity*, v. 9, p. 108-131, 2002.

Roth, W.-M.;Tobin, K.;Zimmermann, A. Coteaching: Learning environments research as aspect of classroom praxis. *Learning Environments Research*, v. 5, p. 1-28, 2002.

Roth, W.-M.;Tobin, K.; Zimmerman, A.; Bryant, N.;Davis, C. Lesson on and from the dihybrid cross: An activity theoretical study of Learning in Coteaching. *Journal of Research in Science Teaching*, v. 39, p. 253-282, 2002.

Tobin, K.;Roth, W.-M. *Teaching to learn:* A view from the field. Rotterdam. The Netherlands: Sense Publishers, 2006.

Veresov, N.Zone of proximal development (ZPD): the hidden dimension? In OsternA.;Heila-YlikallioR. (Eds.),*Language as culture:* Tensions in time and spacevol. 1(p. 13-29). Vasa: Åbo Akademi, 2004.

Vygotsky, L. S. *Mind in society:* The development of higher psychological processes. Cambridge, MA: Harvard University Press, 1978.

_____. *Thought and language*. Cambridge, MA: MIT Press, 1986.

_____.*Psyxhologija razvitija čeloveka* [Psychology of human development]. Moscow, Russia: Eksmo, 2005.

Warford, M. K. The zone of proximal teacher development. *Teaching and Teacher Education*, v. 27, p. 252-258, 2011.

Wassel, B.; Lavan, S. K. Tough transitions? Mediating beginning urban teachers' practices through coteaching. *Cultural Studies of Science Education*, v. 4, p. 409-432, 2009.

Zuckerman, G. Child-adult interaction that creates a zone of proximal development. *Journal of Russian & East European Psychology*, v. 45, n. 3, p. 43-69, 2007.

ABOUT THE AUTHORS

Michele Salles El Kadri has a doctorate in Language Studies from the Universidade Estadual de Londrina (UEL). She is a professor at the same institution.
E-mail: mielkadri@hotmail.com

Wolff-Michael Roth has a doctorate from the College of Science and Technology at the University of Southern Mississippi. He is a professor at the University of Victoria (Canada).
E-mail: wolffmichael.roth@gmail.com

Alfredo Jornet Gil has a doctorate in Educational Psychology from the University of Oslo (Norway). He is visiting researcher at the University of Victoria, British Columbia (Canada).
E-mail: a.j.gil@intermedia.uio.no

Elaine Mateus has a doctorate in Language Studies from the Pontifícia Universidade Católica de São Paulo (PUC-SP). She is a professor at the Universidade Estadual de Londrina (UEL).
E-mail: emateus@gmail.com

Received in January 8, 2015
Approved in June 17, 2015