Cognitive Aspects of Interaction in Foreign Language Teaching

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In the Applied Linguistics area, there is a growing interest in researches concerned with understanding the implicit factors upon the use of language in the classroom context (Allwright & Bailey, 1991; Chaudron, 1988; Johnson-Laird, 1983). There is also an effort to involve teachers in a process of critical reflection about their own practice in Continuing Education Programs (Schön, 1983; Zeichner, 2001). This investigation, an excerpt of a doctor research, was developed in a continuing education program developed by a university from Brazil. It aimed at understanding the cognitive factors implicit in the interaction promoted by a teacher in English as a FL (foreign language) context. The data came from questionnaires, mind maps about interaction, classroom video recording, and stimulated recall sessions. The discussion was based on an interface between the Discursive Theories (Miaskovsky, 2008; A. L. A. M. Oliveira, 2006), Mental Models Theory (Johnson-Laird, 1983) and the Vygostskian Socio Historical Cultural Theory (Vygotsky, 1984). The results point some advantages of using mind maps and discussions to elicit mental models about interaction. The tools provide a picture on how the participant perceives her working context as well as how the interaction concept is organized cognitively by her. Evidence points to a relationship between the participant background experiences, mental models, and actions in the classroom. It suggests that, besides mental models, other factors influence the selection of content, the class planning system and the actions of the teachers in the classroom context. The study contributes to expand the researches related to mental models regarding specific aspects in the learning process, thus collaborating with the teacher’s education.

Keywords: continuous education, English language, conceptual processes, mental models, interaction

Introduction

Since the beginning of the 1990s, Continuing Education Programs have been emerging in Brazil in order to attend better the teachers’ demand to understand their students’ needs, work context, and their own teaching approach better. These programs have considered “the situated nature of teachers’ practice, the valorization of cognition, teacher own approaches and life stories” (Abrahão, 2010, p. 11) as the essential elements to the

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1 “The teaching approach is a set of rules that the teacher has to guide all actions of the overall operation of teaching a foreign language. The approach is a working philosophy, a set of explicit assumptions, established principles or even intuitive beliefs” (Almeida Filho, 2002, p. 13).
development of communities of practice, in which the collaborative dialogue among the participants of the process, lead to the reconstruction of identities and the (co)construction of knowledge in social contexts. The growing importance attributed to collaborative research which helps teachers in the perception, comprehension, and practice improvement in a continuous and conscious approach followed by a similar evolution, in general terms, to that one related to the teacher cognition. The studies from this nature present a movement of contribution to the teachers’ pedagogical thought and have helped them in the teaching approach comprehension and improvement (Celani, 2001; Mateus, 2002; M. L. S. Jorge, 2005). These investigations are based on a learning system centered on the development of reflective thinking (Magalhães, 2004; A. L. A. M. Oliveira, 2006). They create the approximation between teacher educators (universities) and teachers (schools) in continuous education and this approximation is beneficial to the development of both parts, because the teachers can become “critical in relation to the actors of education, in other words, the direction, the students, and the community” (M. L. S. Jorge, 2005, p. 4). Furthermore, the educators become more prepared to qualify the teachers that will act in schools.

In this paper, it is proposed that teacher education should be a reflective and continuing process, in which language is one of the tools used to build knowledge in a collaborative and significant way, leading to the development of awareness of the implicit factors that guide the teaching practice. The goal is to demonstrate that there are instruments capable of eliciting mental models, engendering critical reflection and movements of changing in discourse and practice. Furthermore, understand the cognitive factors in the interaction promoted by the teachers in English as a FL (foreign language) context. In support of this, it is important that the teachers describe, analyze, and explain their approach to teach and understand, “how and why they make certain choices or take certain actions in the classroom” (Dutra & Mello, 2001, p. 47). We are aware that the reconstruction process of the practice of teachers is complex and requires a “review of entrenched presuppositions” (Vosniadou, 1994, p. 47).

Theoretical Frame

In this section, we present a brief discussion about the theoretical background that frames this investigation: The teaching education model framed by the collaboration, continuing process, and critical reflection. The basis of the continuing education program of foreign language teachers, a project that, promotes teachers’ autonomy, awareness about their roles and changes in their own teaching/learning context. Afterward, aspects related to the teacher cognition and definitions of interaction are proposed to sustain our interpretation presented in the data discussion section.

Continuing Education of Language Teachers

Research fields in teaching education demonstrate a concern in a process of instruction permeated by the development of reflective thinking (Almeida Filho, 1999, 2002; Celani, 2001; Dutra & Mello, 2001; Freire, 2005; Miaskovsky, 2008; Abrahão, 1996; Wallace, 1998; Zeichner, 2001). In this investigation, the basis of this

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2 Teacher’s educators are undergraduate teachers who prepare and instruct the future teachers.
3 “Mental models are personal, internal representations of external reality that people use to interact with the world around them. They are constructed by individuals based on their unique life experiences, perceptions, and understandings of the world” (Jones, Ross, Lynam, Perez, & Leitch, 2011, p. 1).
instruction is constructed by the development of critical reasoning, by the reflection and conceptualization of teaching approach (Aguiar, 1981; Bock, Furtado, & Teixeira, 1999; Laurence & Margolis, 1999; Smith & Medin, 1981), framed by the optic of Mental Model Theory and the definition of teacher cognition (M. Borg, 2005; Byrne, 2002; Ehrlich, 2006; Johnson-Laird, 1983; Vosniadou, 1994).

In order to discuss the trajectory of teaching education researches, it is necessary to mention some paradigm changes that had really interfered in the FL teaching area, in teaching education programs, and in the roles assumed by the teachers in their classrooms. These changes had happened, according to Allwright and Bailey (1991), when professionals from the area observed that some questions related to language teaching, could not be solved by teacher training or by researches based on methods and techniques application and recognize the need to investigate what constitute a good teaching methodology and how could be put into practice, changing the focus of researches from prescriptive to descriptive ones, as we are going to discuss in the following paragraphs.

Until the 60s of the 20 century, the research on teacher education devoted to the description of the personal qualities of teachers as determinant factors of educational quality. The goal was to find stable features in them, in order to create an unique model of “good teacher”. According to Teberosky and Cardoso (1990), around the late 1970s, is that “research in the classroom began to be structured in a more systematic way, based on process-product paradigm” (p. 49). Based on this paradigm, researchers began to link the personal qualities of teachers with the students’ academic results and, thus, the emerging of the concept “teaching competence”. Under this view, the goal of teacher education has become the creation of efficient techniques that could achieve a positive result with the students (Teberosky & Cardoso, 1990; S. B. Oliveira, 2004).

Consequently, teacher training has focused its efforts on acquiring and developing skills in order to get the teachers to put certain skills into practice so that students’ performance could be optimized. The teacher, according to this paradigm, was considered to be the executor of curricular requirements, prepared by “qualified professionals” who believed that the variables of the classroom could be controlled externally (Contreras Domingo, 1985; Teberosky & Cardoso, 1990, p. 50).

Within the impact of cognitive psychology, the object of study in researches in teacher education was no longer the teachers’ performance and took up place in understanding the psychological processes that sustained and constrained their actions. The teachers were seen as active agents in the process of teaching and learning (Teberosky & Cardoso, 1990, p. 50). Their knowledge, beliefs, attitudes, and mental models, constructed throughout life, have been considered. Research on teachers’ thinking began to evolve with its own identity, trying to understand the processes and implicit structures in their thinking.

Moita Lopes (1996) and Wallace (1998) proposed the education of a language teacher that is no longer trained to implement methods of teaching and transmitting ready and finished knowledge. Analogous to this, “critical reflection on the practice becomes a requirement for the Theory/Practice relation without which, the theory could become blah blahblah, and practice of activism” (Freire, 2005, p. 22). M. Jorge and S. B. Oliveira (2001) stated that, “the education conception of these professionals has changed from training to a conception of formation” (p. 4). This education, initial or continuing, brings the teachers opportunity to reflect on their thinking, experience and knowledge in order to reconstruct, in a continuous process, their own approach to teaching. The teachers in this process are the people “who educate themselves when teach and transform themselves and the others by learning” (Freire, 2005, p. 23). They learn in a mutual process with the student and within practice.
According to Richards (1998), “Reflective approaches to teacher development start from the assumption that teachers, rather than methods, make a difference” (p. 3), because they are no longer the ones who simply apply those compatible techniques with a certain method, but those who reflect and build their own practice. According to Mattos (2000), the reflective practitioner in a professional development process, creates strategies, and assumes postures, adopts procedures within the classroom in order to contribute to the process of student learning, exploring and trying to understand their own methodology. Teberosky and Cardoso (1990) stated that, the purpose of this reflection is in addition to a practice of self-assessment, a way for teachers to investigate their own theories and formulate principles that account for their teaching.

In this sense, teachers education becomes a process of construction or reconstruction of the knowledge developed by the mediation of lectures, teaching courses, action research, collaborative projects and based on social resources available, besides the system of prior knowledge and their own practice (M. L. S. Jorge, 2005; S. B. Oliveira, 2004; A. L. A. M. Oliveira, 2006). Therefore, we need to consider that it is not sufficient that the teachers know what is to be done, but to understand “what, how and why” they are doing in that way (Dutra & Mello, 2001). How to develop in this professional the “pedagogical thought that incorporates the political dimension of the teaching practice and the concept of social change implicit in it?” (Mateus, Gimenez, Ortenzi, & Reis, 2002, p. 58). What kind of skills do teachers develop through reflection?

Magalhães (2004) suggested education programs that proposed the teachers moments to “the appropriation of new discursive organizations, enabling them to describe and evaluate the classroom practices and learning in interaction with others” (p. 70). The author argues that collaboration is the key factor for the development of critical teachers. During the collaboration, the teachers can “develop skills such as description, interpretation, association of ideas, comparison and reconstruction that are of primary importance for the teachers to become agents of their actions” (Magalhães, 2004, p. 70). Romero (2008) emphasized the importance of this model for pre-service teachers giving them the opportunity “to express themselves, to document and reflect on their learning path” (p. 417). According to the author, they will be able to re-signify their future practices, because they will be “aware of the meanings constructed along their path” and “along the differences which exist among them and their representations” (Romero, 2008, p. 417). Liberali (2008) argued that the redefinition of the practice by reflective approach “focuses on providing tools for educators to act in order to understand the process of describing, informing, confronting and reconstructing their practices” (p. 45).

The collaboration has been studied in pre-service and in-service language teaching contexts. It is pointed out as one of the key elements that assist the educator in implementing the “naive knowledge” to build the more “critical ones” (Freire, 2005, p. 39). We corroborate the need for continuous and reflective education to develop, among other things, the consciousness and autonomy over teachers’ actions (Celani, 2001, 2002; Mello, Dutra, & M. Jorge, 2008; Abrahão, 1996).

As presented in the previous paragraphs, many research projects are ongoing in the area of languages

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4 Autonomy, in this study is envisioned as a multidimensional capacity that the teachers have to build their professional development. It is a process by which they educate themselves, direct cognitive processes, the course of their own learning and management decisions are made in rebuilding their own goals and mental models, finding their own voice on collaboration and becoming authors of their own worlds (Benson, 2001; Pennycook, 1997). From the development of a critical reflective process encouraged by his own teaching experience, and the sociocultural perspective of teaching and learning, the knowledge is seen as co-constructed within the social contexts permeated by semiotic artifacts or instruments, including the language (Abrahão, 2010, p. 11).
teaching education. However, many negative portrayals of FL teaching in public schools are still being built by Brazilian society in general. We often hear assertions that the teachers assign responsibility to the poor quality of FL teaching, or even that the public school does not really teach FL. This assignment is explained by the fact that the teachers are unprepared or unqualified, and also blamed the university that does not give proper education to teachers. However, as pointed out by Dalben (2004), public universities, which can carry the title of “excellence” of superior knowledge, graduate only 30% of teachers in basic education. In addition, we also know that teacher education is not taken within the universities as an area of academic prestige. And yet, according to the author, graduate programs, hardly ever or never, are structured with specific linkages with the graduate in pursuit of excellence in the incorporation of teacher education.

Continuing education can be a space that allows teachers to educate for autonomy. Such programs should ensure “the use of language as a discursive practice” where teachers can be heard and bring the challenges they face in their contexts so that, in partnership with the university, can be agents of change through critical thinking and collaborative action (Goldchleger, 2003; Magalhães, 2004; A. L. A. M. Oliveira, 2006). This process of change or transformation is possible, because “every action is assumed to be mediated by individuals who constitute themselves as agents with the power to change the conditions that mediate their activities” (Liberali, 2008, p. 22). Through continuing education that emphasizes partnership, training, and research, the teacher will have the opportunity to discuss and negotiate their thinking and seek more innovative actions, resuming the awareness of various processes of teaching and learning (Celani, 2003, p. 28). It is important that these professionals are in constant “state of learning”, in other words, that they become permanent learners who could criticize and recreate their own teaching approach (Mateus, 2002).

Such education programs “provide the teachers creativity, to be aware of the contextual factors that permeate and inter-relate to their approach to teaching” (Abrahão, 1996, p. 287) and can assist in the restructuring of the mental models of the teachers, in order to add values to academic and professional conceptualization. Therefore, teacher education should consider the cognitive and linguistic aspects implicit in the profession, as will be discussed in the following section.

**Teacher Cognition**

The cognitive psychology developed, during decades a great effort to understand how we represent knowledge about world and how the cognitive processes, based on knowledge are operated (Rodrigo & Correa, 2004). In teaching education field, S. Borg (2009a) defined the teachers’ cognition as the “unobservable dimension of teaching—teachers’ mental lives” (p. 163). According to the author, in order to understand teachers and the teaching process, it is necessary to investigate their thoughts, knowledge, and beliefs that influence what they do in their classrooms (S. Borg, 2009a, p. 163). The teacher cognition is directly influenced by factors such as schooling, the professional coursework, the contextual factors and the classroom practice (M. Borg, 2005). The process of reconstruction of teachers’ practice can be investigated through a holistic and integrated framework eliciting and analyzing discourse and connecting psychological constructs and teachers’ actual actions and instructions in the classrooms. This approach of investigation, as stated by M. Borg (2005), has the assumption that “teachers are active, thinking decision-makers who make instructional choices by drawing on complex, practically-oriented, personalized, and context-sensitive networks of knowledge, thoughts, and beliefs” (p. 81).
The Mental Models Theory also offers a perspective about how people reason differently. According to this theory, the human beings build cognitive and cultural models of the world making use of tacit mental and recursive processes⁵ which govern the comprehension and the use of language (Johnson-Laird, 1983; Palmer, 1996). The mental models that we process in our minds during the reasoning are considered as “physical or chemical systems that has a relation structure⁶ similar to the process that it imitates” (Johnson-Laird, 1983, p. 3). Since the model has a relation structure similar to the process it models, it can be useful in explanations, because explanation depends on understanding: If you do not understand something, you cannot explain. Understanding certainly depends on knowledge and belief.

In our investigation, the perception of the participant⁷ about interaction, the images she created to illustrate her teaching approaches are built socially and they constitute cognitive models by which the teaching experience is interpreted (Palmer, 1996). Based on these arguments, her experiences are like scenes of the real world that work as a scaffold point that helps her acquiring conceptual schemata. In this case, she can have stable cognitive models that can remain with her inactive for months of years, or can only be remembered and used in appropriated situations, like in the stimulated recall section. She can also construct mental models by determining descriptions from her classes or she can abandon this representation in favor to a propositional indetermination her own description. This can happen because the models are easier to remember than the propositions, maybe because they are more structured, elaborated and require a higher quality of processing to construct them (Johnson-Laird, 1983, p. 162). Hence, the necessity of creating opportunities to discuss practice stimulating or eliciting from the participants “statements that engender tension” (A. L. A. M. Oliveira, 2006) is capable to promote conflicts with the subsequent discourse, to emerge a problem or an explanation need. If there is a conflict, the participant can try to reconstruct an appropriate alternative model (Johnson-Laird, 1983, p. 164). If there is no conflict, probably she will not have the need to seek alternative models and consequently, there will not have changed in discursive movements. So, the way the background knowledge or schemas are activated can be crucial to reach the propitious teaching conditions to a conceptual change. Coding situations are more than retrieve information from the semantic memory (Rodrigo & Correa, 2004, p. 88).

Nowadays, there is a current interest focused on conceptual changes. However, it is more difficult to get the idealized conceptual change in these terms in the teachers’ mind. Before, during, and after, coming to schools, working as teachers, they are common people, directed to construct implicit representations or theories about the world around them in order to interact and act effectively in it. “The epistemological substratum which orients the construction of those theories is not the same that orients the construction of the scientific theories” (Rodrigo & Correa, 2004, p. 90). Consider that the construction of quotidian knowledge is not an intellectual exercise of approximation of accuracy and true, but it is a way to rely on effective and useful interpretations to arouse explanation about the quotidian phenomena in our environment plan actions in our lives.

**Interaction**

Conceptualizing interaction is complex and involves analysis that should consider areas such linguistic,
pragmatic, cognitive and socio-historical, cultural and perhaps, therefore, has not yet been defined clearly. Researchers in the area of Applied Linguistics, interested in FL teaching and learning, including the socio-interactionist, debate about how best to define the term. Some research areas can be taken as a basis for discussing what is interaction with an emphasis on input processing, modification of discourse, negotiation of meaning, social interaction and conversation analysis (Lamy & Goodfellow, 1999, p. 44). Studies of these areas were based on the idea of comprehensible input postulated by Krashen (1982). He stated that the acquisition takes place when the learner understands the input \( i \) that contains some forms beyond its current level of proficiency \( i + 1 \). By understanding the input, the student’s interlanguage necessarily advances. In this model, the more comprehensible input students receive, the greater the acquisition of language. Krashen is much criticized, because rejecting the importance of production and interaction in the acquisition of a L2 (second language) or FL. It seems to us that making comprehensible input is crucial in the process of acquisition of L2 or FL, but some research areas have other views that differ from or complement the proposal author.

Another reference for studies of interaction is Marxism and the Philosophy of Language (1992) from Bakhtin in which the author discusses the verbal interaction by emphasizing the social fact which is inherent in it, highlighting the discursive constitution of the individual and the constitution of the proper individual directly modeled by social interaction (Fernandes, 2002). In Bakhtinian conception, “whatever aspect of the expression—considered statement, will be determined by the utterance conditions in question, that is, above all by the immediate social situation” (Bakhtin, 1992, p. 112). In this sense, the individual is the first social and then individual, because individual personality is socially constituted. This is relevant, because according to the author, “the statement is the product of the interaction of two or more individuals who are socially organized” (Bakhtin, 1992, p. 117) and “the social environment that surrounds them, is in constant interaction and it is the organizer center of all the enunciation of every word or expression” (Fernandes, 2002, p. 73).

Although research on interaction has been developed from different perspectives, they share some common assumptions about the nature of language learning. The socio-cultural surveys focusing on conversation analysis is concerned with how social order is constructed through linguistic interactions (Vygotsky, 1984; Mccarthy, 1991; Heap, 1997). All the assumptions come from the presupposition that the input must be comprehensible to the language learning happens. Research on the modification of speech and focusing on teachers’ discourse is interested in understanding the rules of negotiation for the development of interlanguage (Lamy & Goodfellow, 1999; Hall & Verplaetse, 2000). These perspectives are of great importance, because they help us better understand the corpus of the contexts studied.

**Methodology**

**The Context**

This research is a case study developed by the researcher and a teacher\(^8\) who is attending the program\(^9\). This project is developed by the Faculty of Language Teaching in a Federal University from Brazil. It attends teachers of English from public schools and involves teachers from the university, undergraduate and postgraduate students

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\(^8\) The teacher decided to use her name during the data presentation and discussion. She is Kenia Sidon Sirianni and in the data discussion she is named by her first name.

\(^9\) The information below was translated, summarized, and retrieved from the project site.
and has a large social and academic relevance. The project aims at offering the participants opportunities to the professional development at the linguistic and methodological fields.

The continuing education program started in 2002 due to the perception of some FL teachers of the Language Teaching Faculty that they might contribute to the professional development of teachers from public and private schools. This perception emerged from many interactions with public school teachers, mainly through research projects and discussions about the entrance test from that university.

Between 2002 and 2007, the course modules offered language, methodology, cognitive issues, socio-cultural learning, action research, and ethnography in 300 hours of activities, certificated by the university extension. From 2009, the program’s format has changed to one year project, 112 hours, aimed at the practical and theory modules and 120 hours of language classes. In theory and practice modules, there was a connection between language learning activities and aspects related to teaching literacy, the collaborative problem-solving, planning, and integration skills. Nowadays, the participants receive scholarships to attend two semesters of FL in the extension center of the faculty.

The project involves teacher educators from several units, such as Faculty of Humanities, Faculty of Education, and Institute of Biological Sciences to give lectures and classes, monitors guide, coordinate and develop research. The project also includes the participation of students in the Graduate Program in Linguistic Studies and a degree in English. Students of postgraduate work together in modules, orientating monitors, and developing research. The graduate students collaborate in the preparation language activities and develop their own action research practices.

The Data

The collection of research data referent to the classes was made in a public school where the teacher works. This school serves the elementary and high school. The second collection was organized in a context for the stimulated recall sessions that took place in a classroom at the faculty of language teaching in which there was a TV, VCR, and audio recorders. In order to conduct the investigation, the following data collection instruments were used: questionnaires, concept mapping, classroom observation and filming, and stimulated recall session.

The research questions were answered using different procedures for data analysis. In the first phase, the analysis of questionnaires was used to check how the participant conceptualized and discussed the importance of the interaction. Classes were filmed to have a picture on how the teacher put into practice her ideas of interaction. She had access to such data and could discuss them, having been encouraged to enter into a process of critical reflection on her practice. The goal was to make explicit, the possible implicit factors in the interaction process, and make understand how and why she reasoned that way about her experience and how this interpretation was verbalized.

The stimulated recall session was analyzed and discussed based on the discursive model proposed by Miaskovsky (2008) regarding the “context of production, thematic content, general outline of the text, argument and turn analysis” (p. 96). This model is a way to evidence the thematic sequences in which the production of meaning is organized. Analyses were organized into three moments: The first refers to the production context, thematic content, and overall layout of the session. The second one is the analysis of the turns with regard to the effects of the “statements that engender tension” proposed by the researcher. And the third one presents analysis of the arguments used by the teacher to discuss the proposed themes. To this end,
the analysis of the conversation was presented in three dimensions: the distinction between agreement and disagreement; continuing the conversation (elaborate replica/minimum replica\textsuperscript{10}), and requests for information (Miaskovsky, 2008).

The stimulated recall session was established and analyzed in this prism, because it can promote the critical professional development, since the speech movement in question, can confirm both the phases of critical reflection proposed by Bartlett (1990), map, inform, context, evaluate, and act as well as foster different levels of reflection: descriptive, dialogic, and critical (Hatton & Smith, 1995, p. 48). The interpretation of all data were done with an interface between the Mental Models Theory (Johnson-Laird, 1983; Vosniadou, 1994) with the methodological resources of Conversation Analysis (Miaskovsky, 2008). With this interface, the speech was considered as the use of language that occurs in interaction with the goal “to reflect and model the social, political and cultural educational development of individuals in society” (Jaworski & Coupland, 1999, p. 3) enabling addition or revision of mental models of the participant.

Data Discussion and Analysis

This paper is part of a research on the construction and transformation of conceptual processes (S. B. Oliveira, 2009a). In this article, it will be presented below a brief analysis of the construction of concept maps and the stimulated recall session. The excerpts demonstrate some of the moments, the syntagmatic, discursive, and argumentative constructions that may have promoted the transformation of the concept of interaction of the participant teacher.

Concept Maps

The researcher set up a conceptual map with pre-set categories that could define the interaction and the teacher filled out the same map at the beginning and end of the research. This strategy was used to elicit the mental models about interaction. The words used on the maps were analyzed through a syllogistic inference procedure proposed by Johnson-Laird (1983) on theory of Mental Models (“if p then q”). The argument has two premises, each category represents a possibility considering “¬” (not).

(1) \( p \Rightarrow q \);
(2) \( p \neg q \);
(3) \( \neg p \Rightarrow q \);
(4) \( \neg p \neg q \).

The first premise is a conditional or “if-then” statement, for example: The first describes the situation where there is a true \( p \) (keywords used by the teacher to define the concept) and there is a true \( q \) (interaction in English language learning/teaching). Then, the statements are true because if she defines interaction based on the communicative approach principles, implicates in something true (students’ language learning for example). Supposing that the premises are both true or both false as in items (1) and (4), this is a valid argument since it is not possible for the conclusion to be false. On the second premise is that, the teacher presents keywords to define interaction that can implicate in something false, so it is not the case that \( q \). The argument in this case can be false, because she could have some conceptual mistakes. In item (3), she can use words to define

\textsuperscript{10} Elaborate replicas are open answers composed by narratives and arguments and minimum replica are short answers.
interaction that could not have a direct relation to language learning, but that could benefit or bring some support to her teaching approach. Then, the conclusion is can be true.

Thus, if the teacher recognizes these factors (keywords) as part of the definition of interaction, then such phrases make up the mental models that can interfere with the teacher and the way she works in her classrooms. In this sense, the phrases which are presented in Kenia are seen as mental models, so they present an identical structure to human conceptions ongoing discussion sessions and probably in performance in the classroom. Table 1 presents the results of the maps in the initial and final phases of the process.

Table 1

<table>
<thead>
<tr>
<th>Interaction in the classroom</th>
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<tbody>
<tr>
<td>Categories</td>
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<tr>
<td>Is</td>
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<tr>
<td>Can be</td>
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<tr>
<td>Is generated by</td>
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<tr>
<td>Can be produced by means of</td>
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<tr>
<td>Favors</td>
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<tr>
<td>Is more effective</td>
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<td>Has</td>
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</table>

In phase 1, Kenia shows concepts of interaction that reinforce the importance of the role of occupation (to hear the student, prepare, motivate, and innovate), with the multiple faces of the teacher (the enthusiast, crazy) and affection (self-esteem, motivation, joy, excitement, and satisfaction). In the final phase, we observed that the words “hear, motivation, and interest” are repeated in the second simulation. In these situations, but dealing with a new situation (map 2), a core of ideas and representations can be identified and tracked over long periods of time. This is because we can only grasp the new in terms of what we have already known. There are no occurrences of adjectives in the final and new propositions are used nouns (confidence, sensitivity, maturity, intelligence, opportunities, attention, flexibility, attention to students’ approach, interest, motivation, creativity, energy, and persuasion) and verbs (speaking, listening, respect, dialogue, guiding, supporting, giving examples, and making first with students). We infer that the words communicated by the teacher early in the search form mental models that anchored the construction of the new models at the final stage.

The construct interaction that was set early in the search form generalizing (motivate, innovate, and happy...), became more specific and related to the definition advocated by academics (speaking, listening, and dialogue). The verbs used in the final two years indicate the actions involved in the interaction/communication is one of the factors responsible for construction of the enunciation and development of the student’s interlanguage. The nouns in the categories “is generated by” and “favors” reveal the affective side to which the teacher believes to be of great importance. In other categories we can see traces of an approach that the teacher would be more interactive. They were built with keywords that relate to the role of the teacher to draw students’ attention (motivation), provide opportunities to interact, support and examples in the management of activities in the classroom.
Moreover, the words make reference to the student who would be motivated to attend classes. This expansion of the teacher’s reasoning was because the construct was understood and a model was prepared for it. Kenia probably has designed a probable conclusion from the models built during the research and tried to find alternative models to construct a new interaction. By analyzing these data in this manner, we argue that “models of the state of affairs described in the assumptions of the teacher, formulate conclusions based on them and then look for variants of these models in assumptions and practice” (Johnson-Laird, 1983, p. 133) to find out if there are any conclusions that should or can be true or counterexamples (Johnson-Laird, 1983, p. 133). In presenting the equivalences reproduced above, we make an agreement with the basic indications of the definition of interaction in the proposed concept maps at the beginning and end of the study.

The Stimulated Recall Session

The stimulated recall session lasted 55 minutes and 17 seconds that were used to watch and discuss a videotaped lesson. Table 2 shows the thematic division of the session:

<table>
<thead>
<tr>
<th>Stimulated recall session themes</th>
<th>Discussed actions</th>
</tr>
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<tbody>
<tr>
<td>1st theme: impressions about the videotaped lesson</td>
<td>Impressions of a teacher on their physical appearance Impressions of the shooting and desires for change</td>
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<tr>
<td>2nd theme: the work on cookbooks</td>
<td>Report of the planning and execution of the production of cookbooks Use of English in the classroom</td>
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<tr>
<td>3rd theme: the students’ presentation</td>
<td>The problem of the student’s presentation Factors that discourage teachers</td>
</tr>
<tr>
<td>4th theme: groupwork</td>
<td>Organization of group work Use Conversation cards</td>
</tr>
<tr>
<td>5th theme: teacher Position in the classroom</td>
<td>Lack of movement in the classroom Problems about classroom management</td>
</tr>
<tr>
<td>6th theme: vocabulary and written production</td>
<td>Expansion of vocabulary and development of the written skills</td>
</tr>
<tr>
<td>7th theme: the use of the dictionary in the English lesson</td>
<td>How to use the dictionary in the classroom to enhance student learning</td>
</tr>
<tr>
<td>8th theme: public schools/private schools</td>
<td>Teacher Perception about possible differences between public education and private education</td>
</tr>
</tbody>
</table>

Eight “large dialogic sequences” (Miaskovsky, 2008, p. 123) were found on the stimulated recall session that consubstantiated “discursive movements able to engender the collaborative discussion” (A. L. A. M. Oliveira, 2006, p. 58). Although our focus is the interaction, the central theme of these sequences was the development of cookbooks with the students. However, we believe that such discussion may impact upon how the teacher manages the interactional processes in the classroom. During the discussion, these dialogic sequences corroborated some of the stages of critical reflection proposed by Bartlett (1990): map, inform, contest, evaluate, and act. We observed that the participants have assumed different roles during the viewing session: When the researcher questioned Kenia’s practice, she mapped her practice using arguments, narratives, and justifications to support her decisions in the classroom. The researcher informed with requests for clarification, justification and through suggestions. At some moments the teacher evaluated her practice and made reports of desire for practice change. Due to the data extension, for this paper we will present the analysis of two central themes: the teacher’s impressions about the videotaped lesson and vocabulary development and writing.
Teacher’s impressions about the videotaped lesson. The researcher presented the video of the lesson for the teacher in order to elucidate the first impression of class. Example 1 shows the first impression on the class recorded:

Example (1)

10 R: *What do you think of the videotaped lesson?* [request for clarification]
11 K: (+++) I have never seen myself like this, in a video, no. But it is nice. For a while it is nice (…)
12
13 R: *Ah:::, ok. What did the students do?*[request for clarification]
14 K: Yes::: I showed the books to the people on a Friday. I didn’t show them for you, yet.
15 R: (+++) They are the cookbooks, aren’t they? [requests for clarification]
16 K: on the day they took the cookbooks was very nice. (+++) they took the food, each group organized the work in a stand (+) on the way I asked (+) and they did the cookbook marketing. (and justified) why of the cookbook was. (…) they liked very much, my voice is different. (+++) I am a little different. (laugh) [elaborated replic]

(Stimulated recall session: lines 10-23)

The teacher presented an initial strangeness about her image in the recording, which is natural (lines 11-12). She used adjectives to describe her image “different” to qualify her performances in class “nice, cool” and felt the need to describe what was happening in the video (lines 18-23). Her narrative was intercalated by her first impressions and it was interrupted by the researcher who made requests for clarification in order to initiate the interaction, which resulted in the report, by the teacher of the situation. With an elaborate reply, the teacher assessed the final product that had been built by students in the recorded lesson (the presentation of a cookbook). During the session, at various moments the teacher evaluates their performance in the classroom have been satisfied with what he sees. However, she still demonstrates the desire for change in her practice. In the second excerpt the teacher makes her first mention of a desire for change “but I have to::: (+) I have conditions to improve” and reveal a preoccupation with the students to participate more in class, making them more communicative “I want to make the students (+) speak (English), understand?” (see Example 2).

Example (2)

866 K: I think it is nice until what I have seen here (+) *I think I have::: (+) I have conditions to improve* [evaluation + desire to change her practice]
867 R: How? (+) What can you improve? You tell / [request for clarification]
868 K: ah::: I want to see, ah, I want, I would like to make my students (+) to speak in English, do you understand? (+) I want to see my students !?!
869 (+++) I want to see them more (+) interacting than::: (+) ah, like it or not I always see one doing something else, doing something else, try / create / it, but (+) so I want more (+) I want them to quit this feeling of ?? / at least until such content !? / it was well learned (+) you see? It was well learned (+) I want them to ah::: eh, from, from, from I want them to leave this verb to be level (+) I want them to leave THIS (+) I learned to speak (+) I know to ask names, I know (+) situations (+) I want (+) promote activities / to / different situations (+) I wish my class was mo::: re (+) I wanted it to be more dynamic /still/ (+) what do I do is this (+) it is trying to make my class (+) dynamic, I want it to be the BEST (+) you see? I want the working groups as we work here at the project (+) as we do (referring to the project) [Reflection about the desire to change / elaborate reply]
874 R: I understand [interlocutory validation]
K: did you understand? (+++) I don’t know if my posture is ok

(Stimulated recall session: lines 866-881)

Then the researcher makes two requests for clarification to expand the teacher’s reasoning. In her elaborate reply, the teacher shows her concern in making the students participate in classes interacting in English at the same way she does as a student at the project 11. We realized that the reference Kenia makes to “I want them (the students) to leave the verb to be level” demonstrates the will to do something different than the classes students had before having classes with herself, with lessons focused only on grammatical structure. She says she can make students understand her when she speaks in English, but cannot get them to talk in the target language.

The researcher raises the discussion about the best way for students to learn English. In two distinct moments of the session, we realized that the teacher believes that students learn the target language when they receive input accompanying classes given by her in English and when they speak the target language. Example 3 presents the strategies used by the teacher to make herself understood when she teaches the lessons in English:

Example (3)

R: So what do you do when they don’t understand? [Request for clarification]
K: So I, so I try to make them to speak, I try to elicit, I tell did you understand (+) do you want me, eh, eh me to explain again (+) did you understand, understand, so I make some gestures, pantomime, so I try (+) to make some gesture [minimal reply]
R: then do you use Portuguese, gestures: [Requests for clarification]
K: yes (+) when I see that they express doubt, like this (she changes her face showing doubt) (+) so I check if everyone understood, alright? So to confirm, but they understand, yes, because when they don’t understand, their facial expression show (+) at that moment (+) do you understand? (+) so what happened (+) eh::: they don’t (+) at the moment I speak in English (+) at the moment of the lesson (+) that I stop (+) that I start to speak in English, they gave already accepted this naturally [reflection / elaborate reply]
R: Don’t you give all the classes in English? [Request for clarification]
K: no (+) no, because no::: because it is not possible yet (+++) they are beginners (+) but they accept the class in English naturally ?!/
R: I observed that /
K: did you understand? /in the beginning no/

(Stimulated recall session: lines 957-970)

Amid the discussion of how students learn, the researcher creates a tension to bring the teacher to reflect and verbalize the other skills involved in learning a FL and the procedures she uses to develop them (lines 1004-1005), as shown in Example 4:

Example (4)

P: and do you believe that students will learn more by listening to English Language? [Request for clarification]
K: I believe [minimal reply]
P: just by listening? [Request for clarification]
K: not only listening, no (+) eh::: I have, I am trying to do all the parts that, are appropriate to Language teaching, ne?
(+), a little bit of each thing (+++) nowadays I ask them to write a little bit more (+) né? There is readings, there is ah::: ah(+) nowadays for sure with, with, at the age they

11 The methodology and language classes at the project are conducted in English.
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1013 ARE, that I think that this is a relevant factor (+) a way that I
1014 think an adolescent learn best, I am not saying that, eh::: that
1015 the other skills should be rejected, but there is no doubt that
1016 the best way, they learn best be:::stis speaking and listening
[reflection / elaborate reply]
1017 P: um hum [interlocutoryvalidation]
1018 K: listening and speaking (+++) even because of the songs,
1019 music, even because (+) that they need a teacher who
1020 SPEAKS who talk to them (+) did you understand? Speaking
1021 spe, do:::; doing this job with them, by the games they are
1022 Always playing, by several reasons [elaborate reply]
1023 P: um hum [interlocutoryvalidation]
1024 K: so, for them it is ah, the, the communication that you have
1025 closer the the adolescent is the speaking skill (+++) and:::
1026 the listening (+) did you understand? They need to listen to
1027 the language all the time repeated times. The repetition that
1028 is provoking in a certain way the learning. yes[elaborated
reply]

(Stimulated recall session: lines 1004-1028)

The repetitions of verbs listen and speak in lines 1008, 1016, 1018, 1019, 1025, and 1026 show the
teacher’s belief that students need to listen and speak in the first plan and justifies that the age is the factor that
determines the need for developing these skills (lines 1013, 1025). Regarding the fact that the teacher switch
the target language and mother tongue Nunan (1995, p. 189) agreed that the mother language can be used in the
construction of knowledge, that is to say, as support for understanding the target language.

The vocabulary development and written production. The theme is very frequent in the session,
because during the observation and videotaping of the lessons, the teacher has developed the production work
of cookbooks. During the discussion, Kenia talked about all the stages of the book production and the
researcher has created a tension (conflict) questioning the procedure used for the development of vocabulary.
The statements that engender tension “Why did you decide to work on vocabulary like this before?” made by
the researcher sought to lead the teacher to reflect on the teaching and learning processes of writing in English
FLs as demonstrated in Example 5:

Example (5)

242 R: (+++) why did you decide to work on vocabulary like this?
243 [statement to engender tension / request for explanation]
244 K: How? [explanationrequest]
245 R: giving them the lists to [minimal reply of “how”]
246 K: Frist because I thought, eh, eh, because I THOUGHT at home
247 in a strategy, a better strategy that I thought was this one (+)
248 because what happens, if I asked them as a homework they would
249 search on INTERNET and copy it, they would search a recipe in
250 English, copy and bring to the classroom. I didn’t want that. (+)
251 Second, After making a cookbook with Anne (teacher from the
252 project), what she asked us was this, not bringing anything from our
253 houses, we had to write IN the classroom. An that was what we did /
[justification / adaptation of the practice learned at the project in the
English language lessons ]
254 R: and did she (Anne) give lists too? [statement to engender
tension / explanation request]
255 K: no, no. But her work was on another theme (+) it was
256 environment. (+) I thought about cookbook because recipe was
257 the only vocabulary that I could develop with them, in my
258 situation, beginners[opposition + justification]
259 R: no, but I say this (+) when::: [opposition + overlap of voices]
K: they didn’t have to write as an example (+) we wrote. [justification]
R: so, when you had to write did Anne give you a LIST? For you? [statement to engender tension / request for clarification]
K: no, no. First she provided us with a lot of information (+) we read a text at home (+) she brought (+) so: [justification + overlap of voice]
R: did you read any articles about environment? [request for clarification]
K: yes (+) then we did the writing activity [confirmation]
R: um hum. [interlocutory validation]
K: so::: (+) in the following week, some more articles, more writing (+) and then we selected the best writing texts from each group (+) gradated (+) when we selected the best ones we organized the magazine, what we did was to organize the magazine (+) with a cover, with illustration, as we had to publish it (+) But, what was important wasn’t this (+) she, she::: really wanted to see was our English, was /?!/ produce this magazine (+) but at SCHOOL, what I thought for my students was (+) I told them “what kind of subject I can develop with my students to organize a magazine?” (+) so I thought, recipe, (+) recipe /?!/ [justification through a narrative]
R: did you provide them with some recipes to READ before writing? [request for clarification]
K: Nnnnnno, ah, yes, yes (+) there was a recipe, but there were some groups that I read, there was a group that I didn’t. [elaborate Reply]
R: what about this group in the videotaped lesson? [request for clarification]
K: I gave some examples. In this group I can’t remember. (+) I have a, I put in my portfolio a:: an example from a recipe, banana, banana cake in English (+) [I showed them] [justification]
R: so they re:::ad
K: I showed, I showed them /on day / (+) [yes] [justification]
R: What are the features of the genre recipe
K: so I put, I wrote on the board quick::ly, thus, how would be (+) I didn’t give them written, no, but I believe it would be better if I had done, wouldn’t it?
R: yes. Because it would be ideal if they had read the genre, wouldn’t it? The recipe GENRE (+) READ first a recipe one or two to check the differences and similarities, isn’t it? (+) if they have the same format:::

(Stimulated recall session: lines 242-297)

Kenia made a request for clarification “How?” (line 244) that we believe have the function of refusal to the question asked by the researcher. The minimal replica of the researcher resulted in the use of a more nuanced way of speaking by the teacher “because I thought, I thought to” used to save face of the researcher, and “because the best strategy that I thought was this one” opposite to the first one. We interpret that she used this discursive strategy as a positive social claiming for herself by the line she assumed she had taken during this particular contact, as an image of self delineated in terms of approved social attributes (Goffman, 1967, p. 213). Both statements show respectability and deference which Kenia used by virtue of the relative position she occupies in the social network constructed during the research and the degree to which she is judged to have functioned adequately in that position as well as acceptably in her general conduct (Ho, 1974, p. 883).

Then the justification and confirmation given by the teacher are based on the knowledge she learned at the project. We observed in the video and the teacher’s report that there was a fusion of what was learned in the
project with her background knowledge, which, according to Rodrigo and Correa (2004), can generate an erroneous assimilation of the learned concepts to previous knowledge systems incompatible with these ones.

We noticed that several requests for clarification made by the researcher and the opposition movements of the interlocutors generate a favorable negotiating to the construction of tacit knowledge, since “the questioning of the practice might redirect our attention” to elements of class that teacher “had no awareness or consciousness” before (Miaskovsky, 2008, p. 126).

These statements were intended to expand the teacher’s thinking about the process of reading integrated into written production trying to emphasize the importance of the students to receive comprehensible input through reading and understanding the textual genre before the writing production. The excerpt below in Example 6 demonstrates one of the moments of discomfort experienced by the teacher to evaluate and justify her actions. This excerpt also marks the closure of the discussion of vocabulary development:

Example (6)

296 K: so, I needed to be fast with in relation to this. They were
297 two classes from the term to develop this work, and the rest of
298 the work they did at home and they were due to hand in. And
299 so what happens (+) ah::: I really did ah, ah, ah::: I think that it
300 would be better, wouldn’t it? (+)if I had had time to work like
301 the teacher from the project worked with us (+) but recipe from
cookbook was what I had in mind. [justification]
(Stimulated recall session: lines 296-301)

We believe that the stimulated recall session brought elements that could expand the teacher’s view in relation to her teaching practice, but we are not certain that the instrument is sufficient for the construction of suitable mental models for practical and conceptual change. In some moments, as in Example 5, we see “postures of mutual understanding and questioning among the participants that constitute a discursive pattern that involves negotiation of meaning and learning” (Miaskovsky, 2008, p. 171). In these moments, the discourse context could allow scaffold point for the construction of new information, because the interlocutors discussed general and specific points of the same aspect in the case of vocabulary development, using the class that the teacher had in the project compared to that she promoted in the classroom. And we realized that the thematic content of the stimulated recall session (eight macro dialogical sequences) revealed Kenia’s implicit theories of teaching approach that relate to social and situational mental models through the representations of propositional she verbalizes.

Conclusions

Throughout the data collection, different resources to promote reflection, elicit mental models, and the discuss interaction were used. The elicited themes permeated many areas of the English teaching classrooms12. The teacher reconstructed the definition of interaction supported by the statements used to engender tensions and reasoning conflicts. The instruments used to generate reflection, elicited mental models and helped the teacher to promote discursive changes to reconceptualize interaction. Her definition of interaction by the end of the research could be built with values, knowledge, theoretical readings, and discussions made during the sessions or at the participation at the project. The teacher’s speech reveals alternative mental models to models

12 “Classroom is the place where more than two people unite for the purpose of learning in which one of them is the teacher/professor” (Tsui, 1995, p. 1).
originally identified by the researcher, which can be understood as a conceptual enrichment (Rodrigo, Correa, 2004) and also the appropriation of scientific concepts discussed (Magalhães & Celani, 2005).

In other words, findings can show how the participant (re)constructed her mental models towards interaction including an enrichment and empowerment by the discursive strategy of development of reasoning during the course of the investigation. This investigation achieved its goal of expanding the teacher’s view and reasoning about the elements that constitute her teaching approach with respect to her practice and in relation to other teaching practices. And that is what built the discourse context was favorable, and allowed the anchoring of what she already knew, said, and did, and the construction of new knowledge, approaches, and techniques. This study sought to use methodologically theoretical supports that complement to meet the current educational demand: the need not only to train, but educate teachers of English who works in public schools, considering cognitive, social, and discursive factors. Furthermore, the complementary visions of socio-cultural-historical (Vygotsky, 1984) and the Mental Models Theory led us to understand better how to understand and represent the knowledge people by learning.

Furthermore, the participation at the project and the research expanded the power to capture the challenges and opened dialogue with the teacher and her teaching. This dialogue with its challenges, according to Freire (2005), becomes a historical, a perceptive person, capable of interpreting the causes of events and behaviors, responding to suggestions and emerging issues in context and also become able to engage with others to achieve a transitive state of consciousness (Freire, 2005). Awareness is the development of awareness toward a critical transitivity. What triggers the process of awareness is the perception by the individual of an imbalance caused by some external nuisances. We therefore believe that the challenges of the profession itself are sources of conflicting claims to the process of critical reflection.

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