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ORACY, LITERACY AND CONCEPT MAPS AS MEDIATORS OF THE SOCIAL CONSTRUCTION OF KNOWLEDGE AMONG PEERS

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Abstract. In this paper we provide an account of how primary school children collaborated over time to develop a team project which involved the joint construction of knowledge. In particular, children worked on a writing project by using diverse cultural artifacts, including oracy, literacy and concept maps. The project involved researching, writing, illustrating and eventually delivering a multimodal conference on a topic of their interest. We first review some central socio-cultural concepts which serve as a theoretical framework for the research reported. Then we focus on the macro level, describing the context in which the children interacted to create their projects. This context refers to a "learning community" developed as part of an innovative educational program called "Learning Together". We then present microgenetic analyses of the quality of the interactions taking place as peers worked together on their projects, and how these collaborative processes and uses of the diverse mediational artifacts, and particularly concept maps, were gradually appropriated by two teams of 6th grade children (11-12 year-old). Overall, the work reveals the dynamic functioning in educational settings of some central socio-cultural concepts.

1 Introduction

The present study is grounded on a sociocultural perspective, where knowledge is conceptualized as a product of the joint negotiation of participants to make sense of a given situation, using a variety of communicative strategies and mediational means. This perspective also emphasizes the role of diverse cultural artifacts as mediators of human activity, including a variety of tools and signs, which allow the social construction of knowledge. Thus, in this paper, we provide an account of how these cultural artifacts, including concept maps, mediate interactions as primary school children learn to collaborate on creative writing projects. These activities are embedded in an innovative educational program called "Learning Together".

2 Antecedents

The work on collaboration and the co-construction of knowledge reported here is underpinned by a sociocultural approach to conceptualizing processes of development, teaching-and-learning and education. Inherent in this approach is the notion that if we are to understand the nature of these processes, we need to take account of the intrinsically social and communicative nature of human activity. In this context, education and cognitive development are seen as cultural processes, whereby knowledge is not only possessed individually but also shared amongst members of communities. Students thereby progress from 'legitimate peripheral participation' to gradually assuming a more central role as actors and competent participants in their communities of practice over time (Lave & Wenger, 1991).

Vygotsky (2003) described language as both a cultural tool (for the sharing of knowledge amongst members of a community) and as a psychological tool (for structuring the processes and content of individual thought). In this context, social interactions are gradually appropriated and re-constructed as internal speech - so called "voices of the mind" (Wertsch, 1991) - which contribute significantly to problem-solving, knowledge construction and self-regulation, among other central psychological functions. The implication is that educational success, and failure, may be explained partly by the quality of educational interactions among teachers and peers, as well as of the cultural artifacts that mediate these interactions (Rojas-Drummond, 2000).

The educational value of peer group discussion and collaborative writing

Recent research has focused considerable attention on the potential value not only of teacher led discussions, but also of peer group interactions and dialogues as another means of promoting learning and development. This is because the latter provides a more symmetrical environment for the co-construction of knowledge in which the inevitable power and status differentials between expert and novice are less likely to apply. Close consideration of relevant evidence suggests that some ways of talking in group activity are of special educational value, but that such ways are relatively uncommon in classrooms. This is because children are not usually helped to develop effective

dialogic strategies for thinking collectively (Rojas-Drummond, 2000; Rojas-Drummond & Mercer, 2003). The quality of children's discussion when engaged effectively in collaborative activities in the classroom can be related to the idea of "Exploratory Talk". According to Mercer (2000), Exploratory Talk is that in which partners engage critically but constructively with each other's ideas, providing reasons for their points of view. Knowledge is made publicly accountable and reasoning is visible in the talk, which represents a distinctive social mode of thinking.

In this field, pioneer work by Mercer and Wegerif (Mercer et al., 1999) has enhanced Exploratory Talk very successfully in British primary school children. Following these pioneer studies, research in Mexico by Rojas-Drummond and her colleagues (e.g. Rojas-Drummond et al., 2003; Rojas-Drummond & Peón, 2004) have confirmed that Exploratory Talk is very effective in promoting group and individual reasoning, as well as argumentative abilities in primary school children.

In relation to written language, we define "functional literacy" broadly to include the competent uses of this cultural artifact to carry out diverse meaningful social and communicative activities in a variety of cultural contexts. Writing is a sociocultural process given that its learning takes place in special contexts and institutions designed by society. Even more, this learning involves the competent uses of sophisticated communicative strategies where the interaction between experts and novices is crucial. In addition, writing is not a lonely activity, even if done by one person. The sociocultural perspective emphasizes that writing is embedded in a complex social world, where when creating a text, there are necessarily references or juxtapositions made by speakers and writers to other texts (Maybin, 2003). This phenomenon is particularly evident when writing is collaborative, since a new dimension is added: the referencing to each writer's discourse, where participants are constantly blending their voices for a common purpose.

More recently, our conceptions of literacy have been greatly extended to incorporate the variety of uses of ICT that have permeated society as a whole and education in particular. In this context, authors now refer to the integration of the functional uses of this variety of psycholinguistic, technological and cultural artifacts as 'information literacy', 'multimodal literacy' or 'multiliteracies' (Wegerif & Dawes, 2004).

The educational value of concept maps as facilitators of the social construction of knowledge

Besides oral and written language, another cultural artifact commonly used in education to promote the construction of knowledge refers to concept maps. Traditionally, these maps have been used as a learning strategy that can facilitate the individual development of reflection, assimilation and decision-making processes. Recently, their use has been extended to collaborative activities, given that the use of this tool may encourage the sharing of meanings about the theme been learned, as well as increasing the attitudes and values towards consensus and compromises among participants. In this context, setting down any word on a concept map, implies an exploratory dialogue, where each student justifies why and how, each of these elements can be present (Ontoria et al., 2001).

Concept maps can induce participative experiences in the classroom, through the interaction of all the classmates or teams of peers. When students work in an effective collaborative way, they discuss and act at the same time over the themes they are learning (Edwards & Mercer, 1987). In this respect, concept maps can play the role of mediators for the promotion of an effective collaborative work by acting as discussion detonators which help students construct knowledge jointly. While working in a collaborative way, concept maps can also be used by teachers to help students to focus on the aims of what they are learning. In this way, teachers and concept maps guide the inquiry and organization of knowledge and provide feedback to the students about what they are learning as well as about the aims been pursued; they also serve to represent the unfolding of these processes (Novak, 2003).

Given the antecedents reviewed above, in this study we investigated the role of oral and written language, as well as other multimodal mediators such as concept maps, for the social construction of knowledge among peers in primary schools. It is important to emphasize that the research on the role played by these different cultural artifacts to enhance learning in students has so far been fragmented. In particular, the sociocultural perspective has not focused on the role played by concept mapping as a cultural multimodal mediator of social interactions. On the other hand, research on concept maps has so far paid more attention to the cognitive processes involved in their creation, than to the factors involved in the use of this tool for the social construction of knowledge in educational settings.

Thus, this study brings together these areas of research by analyzing in an integrated fashion the role of these artifacts as mediators of activity during the creation of collaborative projects.

3 The Context of the Study: The Macro Level

The collaborative projects children carry out in the research reported are embedded in an innovative educational program, called 'Learning Together', which has been implemented in a public primary school in Mexico City over the last six years. The purpose of the program is to form learning communities where all members are encouraged to contribute actively to the social construction of knowledge through the mediation of diverse cultural artifacts. Amongst these mediators are diverse uses of different genres of oral and written language, multimodal concept maps as well as ICT for a variety of teaching-learning purposes. These communities strive to promote key functional social, cognitive, psycholinguistic, technological and academic abilities in primary students, which intend to have meaningful applications in a wide variety of contexts inside as well as outside of school.

The program 'Learning Together' is carried out in a multipurpose room within the primary school. Throughout the academic year, the respective participating teachers and students of each classroom come once a week to this setting to carry out collaborative projects, guided by their respective teacher with the support of several university researchers. These projects involve the dynamic integration of several functional uses of oral and written language, multimodal representations of knowledge in the form of concept maps as well as ICT. All the team projects are presented at the end of the school year in a "Cultural Fair", with the participation of the whole learning community. This is done to render the projects meaningful and functional, given their genuine communicative purposes.

4 Description of the Study: The Micro Level

Forty 6th grade children from two classrooms in a state primary school in Mexico City participated in the study (11 to 12 years old). The "Learning Together" program was implemented in 24 weekly sessions. However, for the present study we report data gathered only in 12 of these sessions, where children created their team projects. These projects involved researching a topic of their interest and creating a conference as a result, supported by a Power Point presentation. The resulting conferences were delivered at the Cultural Fair. The conferences produced represented a unique opportunity for learning oracy, multimodal literacy and technological skills in a meaningful and functional context.

At the same time, throughout the whole process of creating their projects, children were encouraged to learn to utilize a variety of cultural artifacts to mediate their activities in an integrated fashion. These included: a) oracy, by discussing, arguing their ideas and making decisions as a team; b) literacy, by reading and writing a variety of expository texts as part of their research project, and c) multimodal concept maps to represent the plans, ideas and knowledge they generated throughout the whole process of creating their conferences, with the help of "Kidspiration" software.

"Kidspiration" favors processes of collaboration and problem solving, as well as making visible how knowledge is socially constructed. This can be possible because of the friendly manipulation of the software and the spaces that it offers for the student's reflections, which can be written down almost instantly. Students construct their maps in a procedural and continuous way. Thus, besides being a learning strategy, concept maps work as collaborative diaries or digital portfolios (Novak & Cañas, 2004). For each classroom, one triad was randomly selected in order to analyze in a micro-genetic fashion their interaction, discourse and successive concept maps, as well as texts and products as they created their conference. Selected sessions were video recorded and later analyzed following procedures developed by Edwards and Mercer (1987).

Overall, the work reported reveals the dynamic functioning in educational settings of some central socio-cultural concepts. These include: collaborative creativity; co-construction; intertextuality and inter-contextuality among oracy, literacy, concept maps and uses of ICT; appropriation of dialogical and comprehension and text production strategies, as well as the role of diverse cultural artifacts in mediating collaboration, including multimodal semiotic representations for constructing knowledge. In particular, analyses of the subsequent interactions and of the systematic construction of the subsequent concept maps by the triads over time reflected an

increase in the sophistication of their forms of multimodal representation as well as their ways of communicating orally and in written form. These patterns suggest a gradual appropriation by the children of the various cultural artifacts under study, which facilitated the social construction of knowledge.

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