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Teaching to teach in children's ZPD and learning about this process

Abstract. Vygotsky (1987) pointed out to the fact that teaching in children's ZPD was the way to support their development and had to be done in class, since development and education as intertwined. Thus we decided to describe how our students' enrolled in a special education program understood how they taught and should teach in their pupils' ZPD. To do so, we asked them to film themselves and to discuss in small groups about these teaching sequences in the light of the concept of ZPD. Our results indicated that our 2nd year students appreciated thinking about the concept of ZPD which they considered helpful to examine thoroughly their teaching strategies, and wished they could have a whole course aiming at such a reflection.

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Introduction

Numerous authors have written and will most certainly write about teaching in pupils' zone of proximal development. Indeed, the concept of ZPD has been widely used in education whatever the subject or the type of pupils (gifted or disabled) (del Río and Álvarez, 2007) or even the age of the persons (Veresov, 2004) being taught. According to Vygotsky himself, the zone of proximal development is:

[...] 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 (1978, p. 86).

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The actual level of development results from what has been learnt or accomplished before teaching while the potential level of development corresponds to what can be learnt or accomplished with help in a near future. And the latter was what interested Vygotsky (1978), who considered that to be valuable, learning has to precede development, the practical implication of this being that learning itself creates the zone of proximal development. Furthermore, this definition implies that to be able to learn in his/her zone of proximal development the child needs the assistance of an adult (or of a more capable peer). Which is more, Vygotsky pointed out to the fact that teaching in children's ZPD was the way to support their development and had to be done in class, since he considered development and education as intertwined (Vygotsky, 1987).

Thus, if we follow Vygotsky's definition, to teach in pupils' ZPD one has to assess the child's actual level of development, to propose him a developmental task and to guide him towards his potential level of development. The less the adult has to help, the more the child has reached a given level of development (Vygotsky, 1997). Although he did not describe how teachers should guide their pupils in the ZPD, Vygotsky gave a very brief and general description of the teachers' role: "The teacher, working with the school child on a given question, explains, informs, inquires, corrects, and forces the child himself to explain" (Vygotsky, 1934/1987, pp. 215-216).

Today, the question of the assistance the child should be offered has become of great importance. Following Wood, Bruner and Ross (1978), a number of authors suggest that teachers should scaffold their pupils while working in their ZPD. According to Larkin (2002), once he has chosen the appropriate task so as to scaffold his or her pupils the teacher has to motivate them, to establish a shared goal with them, to be sensitive to their background knowledge and misconceptions, to provide tailored assistance (by cueing, prompting, questioning, modeling, telling, or discussing), to maintain the pursuit of their common goal by clarifying and encouraging them, to give

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them explicit feedback, and to assist them to internalize and become independent towards the task. This description leads us to consider that the quality of the relation between a teacher and his pupil is extremely important because it will determine the degree to which the ZPD will be established and maintained (Levykh, 2008). But, it also shows that teaching in pupils' ZPD is not an easy undertaking. This is why, as researchers and professors working in a special education program, we decided to observe and describe how our students' capacity of teaching in their pupils' ZPD developed year after year, during the three last years of our undergraduate program. Nevertheless, this paper will present the data obtained in the first year of the study, since data collection of the second year is not finished yet.

One of the important questions we had to address as teachers-researchers is the way we would "guide" our students during the group sessions we held with them. In theory, since we acted as researchers, we should have questioned our students and forced them to explain themselves. As a matter of fact, we found very difficult, even impossible at times not to answer their questions nor to explain and inform (Vygotsky, 1934/1987). Thus, the guidance offered to our students consisted mainly in researchers questioning and forcing them to explain, but also in explaining or informing, and last but not least was strengthened by discussions between peers. The goal of this communication is to examine the effect of these various forms of guidance on our students' understanding of the concept of ZPD.

Method

Sample. The twenty 2nd year special education students who participated in our study had already followed a development course, where they were taught an overview of Vygotsky's theory as a whole, as well as an integrative course where they were invited to teach in their pupils' ZPD during their next training session. Furthermore, when we met them for the first time, we asked them to consider three aspects of the

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concept: the nature and the level of difficulty of the task they had chosen as well as the way they guided their pupils.

Instrument. The data collection instrument was based on an adaptation of the practical argument approach (Fenstermacher, 1994) developed by Correa Molina and Gervais (2010), which consists in encouraging teachers to verbalize their practice in small groups, so as to help them make explicit what is often implicit when they teach. Doing so, we ourselves wanted to work in our students' ZPD. Indeed, the task was developmental and did interest them, since they willingly participated in the study; and, since they had chosen the sequences they wanted to analyse, one can assume that they had determined by themselves their actual level of development. Furthermore, we hypothesized that the guiding strategy we decided to use would help them to reach their potential level, if not of teaching, at least of thinking. In short, we wanted to model the way to teach in another person's ZPD.

Procedure. Participants were instructed to film themselves while teaching and to chose a sequence when they felt they had really taught in their pupils' ZPD and another one when, on the contrary, they thought they had missed the point. These sequences were then watched and discussed in small groups along with one of us, whose role was to guide the students in their reflection about their teaching practice in their pupils' ZPD. These discussions were themselves filmed and transcribed and constituted the research material to be analysed.

Results

The nature of the task

As said earlier, the definition of ZPD such as proposed by Vygotsky implies that the task or activity should be of a developmental nature, i.e. aim at developing higher psychic functions as opposed to activities aiming at acquiring mere habits. In this

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respect, most students chose what can be considered like developmental tasks although they ignored the fact. Thus, if we asked them: “Do you consider that you used a developmental task? “, they would look quite puzzled and had nothing to answer. But if we asked them to describe the intent of their activity, they would answer :“developing his understanding of the structure of the story”; “developing their problem solving ability” or else “developing their ability to write a complex and rich text” and so on. The tasks used and students’ intents are summarized in table 1 below.

Tableau 1
The nature of the tasks chosen by our 2nd year students in special education

Activity	Intent
<ul style="list-style-type: none"> • Reading activity : the story had been cut in different sections which had to be put in order 	<ul style="list-style-type: none"> ➤ To understand the structure of a story.
<ul style="list-style-type: none"> • Writing activity: after having read a story describing the fate of black American slaves, the pupils had to finish it. 	<ul style="list-style-type: none"> ➤ To develop the ability to plan a story, to write a complex text and to understand some scientific concepts related to writing.
<ul style="list-style-type: none"> • Compilation of a glossary on prehistoric times. 	<ul style="list-style-type: none"> ➤ To build up vocabulary and understand new concepts.
<ul style="list-style-type: none"> • Vocabulary and classification according to food categories activity. 	<ul style="list-style-type: none"> ➤ To increase vocabulary and knowledge about the four food categories. To help pupils to become aware of their nutrition habits and eat better.
<ul style="list-style-type: none"> • Reading and story recall. 	<ul style="list-style-type: none"> ➤ Leisure time used to develop listening ability.
<ul style="list-style-type: none"> • Preparation of a debate on the pros and cons of living in Quebec City or in Montreal. 	<ul style="list-style-type: none"> ➤ To develop the ability to argue and to express oneself clearly.
<ul style="list-style-type: none"> • Learning some alphabet letters. 	<ul style="list-style-type: none"> ➤ Possibly learn reading.
<ul style="list-style-type: none"> • Problem solving. 	<ul style="list-style-type: none"> ➤ To develop the ability to understand the nature of a mathematical problem, to reason, to draw inferences, to take initiative, to be autonomous.
<ul style="list-style-type: none"> • Calculating the cost of chocolate fondue that pupils had shared in class. 	<ul style="list-style-type: none"> ➤ To develop the ability to understand the nature of a mathematical problem, and hopefully to draw inferences. To increase pupils autonomy.
<ul style="list-style-type: none"> • Reviewing 3 proprieties of geometrical figures (sides, angles, curves). 	<ul style="list-style-type: none"> ➤ To develop the ability to apply definitions.
<ul style="list-style-type: none"> • Reading a tale including probability problems with dice manipulation 	<ul style="list-style-type: none"> ➤ To develop the ability to understand the concept of chance as well as proportions and factions.

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Thus most of those tasks were of a developmental nature, since more or less similar to those described by Vygotsky (1997) as developmental tasks. Most of them too were quite interesting activities, and in this respect they owe a tribute to our department didactics professors. But, although they used the word “develop”, since it was included in our question, they did not seem to grasp the developmental nature of the activities they had chosen. For instance, they had difficulties to differentiate “development” from “learning”. What they really aimed at was to allow their pupils to acquire new knowledge without thinking of developing their “higher psychic functions” as Vygotsky would put it. In this respect, answering to the question “Do you think the child learnt something?” a student stated: “Yes, I suppose so ... but what I really aimed at was to allow him to succeed and to be proud of himself”.

The level of difficulty

How to assess the level of difficulty of the task? So as to fall in the right range of difficulty, teachers must know the actual as well as the potential levels of development of their pupils. According to our students, such an assessment is really difficult to do for an entire class since a chosen task or activity might be difficult for some pupils and easy for others. One student thought that it was not a real problem “as far as one targets the right range for the entire group”. As far as the actual level of development of their pupils was concerned, our students would describe quite precisely what the children were able to do and what they understood. They would say for instance: “Jimmy knows how to add and subtract and multiply. Divisions are still a little difficult for him. But, his real problem is that he cannot infer from a problem wording which are the operations he should do”. Thus, the problem rather laid in assessing the children’s potential level of development. Some students, like William, had definite landmarks: “I am in my pupils’ ZPD when they have some knowledge of the task but still have to learn about it”. Then he added a little later, although with some

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hesitation: “If a pupil makes mistakes, then I know I am in his ZPD”. To Alice who considered the task (problem solving) she had assigned to her pupil too difficult because he could not do it on his own, Jennifer declared: “No, he was not supposed to do it on his own because if you think of ZPD it means that you have to guide the child”. Alice would not agree because she knew that her pupil would not be able to solve the same problem by himself if he had to do so the day after, so that Jennifer went on: “It is normal to repeat a number of times ... I myself need to be helped several times before being able to do certain things, but ... I do not know if we are still in the ZPD”. Thus although she was convinced that to teach is to repeat, she was not sure whether the concept of repetition was included in the concept of ZPD. In fact, this student was alluding to the concept of appropriation, to the transition from the interpsychic level to the intrapsychic one (Ivic, 2000).

But other participants were rather confused about this, so that some contradictions emerged. Thus, for instance, Alice would say that she noticed that she was not in her pupils’ ZPD because they could not give the correct answer to her questions. But, when asked if her pupils’ success in doing the task was necessary for her to feel that she was in their ZPD she answered : “No, not necessarily”. In a similar fashion, Andrew suggested that: “If a pupil is perfectly autonomous while doing the activity, then we know we are in his ZPD”, but he also said later during the discussion: “The child must know one part of the answer, but he has to look for the other part for a while” implying that he himself, as a teacher, had to help him to do so. This was one of the most important changes we observed in our students: most of them felt that they were not in their pupils’ ZPD if the later had to make an effort to accomplish their task. They would say that the task was too difficult because “yes, he finally succeeded but it was really difficult for him” or “... but it took quite a long time for him to succeed”. For others, the necessity to guide the child while he was working would indicate that they were in their ZPD. For instance, one student would say that the reading task she gave

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one of her pupils was not too difficult because the child succeeded in doing it with her help but was difficult enough because he would not have done it by himself since the text was probably too long for him to go through it on his own. A number of them changed their mind during the discussion, and several students who presented one sequence thinking they were not in their pupils' ZPD finally decided that in fact they had really taught in their ZPD. And the opposite was true too.

At this point, it is interesting to note that, for our students, the difficulty of a given task was not necessarily of a cognitive nature. In the case of this reading task, our student considered that the text itself was not too difficult to understand for her pupil but rather that the child lacked the necessary concentration to read the whole text by himself. So the difficulty was related to his attention processes rather than to his reading processes. Another student considered that the task she had chosen was not in her class' ZPD because some of her pupils were yawning while she was interacting with their peers. The question of motivation was raised many times and most students considered that motivation was the essence of teaching in their pupils' ZPD. Another point of interest was that it was of paramount importance for them to give special considerations to the fact that their pupils had behavioural or learning difficulties or disorders. They considered that a common feature of all these children is that they get easily discouraged and that they fear difficulty because they feel "they are not good". What would be an interesting challenge for ordinary pupils might seem a daunting task for their own pupils, and this in turn would lower their motivation.

The guidance

Student's guidance. Let us recall here that for Vygotsky (1934/1987) the role of the teacher is to explain, inform, inquire, correct, and force the child himself to explain. But, probably influenced by the Bruner's concept of scaffolding (Wood, Bruner, and

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Ross, 1976), some students considered that modeling and explaining were not the right way to teach in their pupils' ZPD, since it led them to "mere imitation". As a whole, they were very critical of their own way to guide their pupils and paid attention to a number of aspects of the guiding process. For instance, they would say such things as: "I notice that I had a tendency to give him the correct answers right away". Generally speaking, they considered that giving the right answer too quickly was a flaw they had to get rid of. And this was linked to their tendency to focus on the answers rather than on the child. Most students were convinced that to teach in children's ZPD implied to focus on their pupils, but most of them found it difficult because they felt they had to manage too many things at a time. Watching the video sequences made them realize that too often in their opinion they would focus on the task itself rather than on the children, thus making it difficult to teach in their zone of proximal development. But they also proposed strategies which they thought would help them teach in their pupils' ZPD, such as linking the activity to pupils' everyday life; keeping eye contact with them so as to make sure they were still listening and alert; paying attention to their reactions so as to notice when they stopped understanding or following the activity; encouraging their participation by asking questions and have them act rather than simply listen; being aware of pupils' difficulties; changing teaching strategies according to their needs; allowing them to think; questioning; giving examples; varying learning formats. As Andrew put it: "There are many ways of teaching in pupils' ZPD: one cannot list them all. There is no recipe for it". Finally, according to the majority of the students we met, lack of motivation was the first difficulty they had to overcome since teaching was impossible without pupil's motivation. "One does not learn anything without the motivation to do so" was a sentence we heard over and over during our discussions. And to motivate children, the first thing to do is to establish an affectionate, caring, respectful relationship with them. Thus, our second year students have already developed a thorough understanding of the way they should teach. Although it is still

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difficult for them to achieve their goals, their conception of teaching is realistic as we have able to observe in a real class with a seasoned teacher (Venet, Schmidt & Paradis, 2008).

Researcher's guidance. As explained earlier, the goal of our research project was twofold: on the one hand, we wanted to observe and describe our students' comprehension of the concept of ZPD; on the other hand, we intended to model the way to teach in someone's ZPD. Resting upon Vygotsky's conception of imitation, according to which imitation is possible only when the person has developed an understanding of a given subject or activity, we hypothesized that modeling might be an efficient way to help our students to dwell more theoretically than usual on the concept of ZPD. In accordance with the practical argument approach, our participation in the discussion consisted mostly in questioning our students and forcing them to explain themselves, although at times we answered directly their questions or gave explanations when their misconceptions were too obvious. We felt we had to do so since students have a tendency to interpret their professor's silences as approbations. Here are two examples of the many interactions we had with our participants.

Interaction 1 – After stating clearly her intent, which was to enhance her pupil's autonomy, this student drew our attention to the fact that “he would never do anything by himself” and how she had to stay by him so that he would do his work. But the cause of his behaviour, according to her, was that he had a short-term memory disorder since it was necessary to remind him everything: to get his notebook out of his school bag, to bring his homework, to take his books home, and so on. Then her “diagnosis” drifted towards an attention disorder, although she also described the boy as a pupil who was able to do multiplications for hours without getting tired of it. So the researcher asked if one could say that he had an attention disorder. “Well, yes, he can do this for hours, but ... with someone next to him”, and she started to explain the boy's situation:

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he had been an orphan for several years now, his life at home seemed to be difficult, he was shy, he would not communicate, he would not concentrate on what he was doing, he needed a lot of attention. After a while, during the sequence, she had to let the boy work on his own because another pupil needed her. The young boy went on solving the problem they had been discussing together. So, the student was asked how she felt while watching this part of the sequence, the researcher's intent being to help her realize that the child had been autonomous while solving the problem:

-- I am happy because he ... he always achieves little things, only little things. When I came back to him he had added 8 to 2009 and his answer was 2017, and he was right"

-- Is this what makes you happy?"

-- Yes ... because he went on thinking by himself and he succeeded in what he was doing.

-- Could we say then that he can be autonomous?

-- Yes, that was has to be worked on with Jeremy, his autonomy.

Interestingly enough although she was happy that the child could think on his own the student could not recognize that at this precise moment he had been autonomous. And when asked if she thought she had taught in the boy's ZPD, she said that she had not because he would not be able to do the same problem on his own the day after. Thus, one can say that this interaction unsettled the student but did not succeed in having her change her mind about the situation.

Interaction 2 – In the sequence we watched, Sandy felt she was not in her pupils' ZPD because she was trying to explain them the concept of "stilts" in the expression "stilt house". She thought the meaning of this word was too difficult to grasp

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for her 1st year pupils and that she was not in their ZPD because after having used the definition offered by a dictionary for children, she tried to explain the meaning of the expression by giving examples... and the children still did not understand it and had to show them a photograph of a stilt house so as to illustrate the concept. So the researcher asked:

-- So you looked up in the dictionary with your pupils, then you gave your own explanation with an example, and finally you showed them a picture of a stilt house. Do you still feel that they did not understand what a stilt house is?

-- I am not too sure. But the picture certainly helped them. They were pleased to look at it, they thought it was nice; they realized that those houses could be built not only in water but even on the grass ... because you know I had chosen different pictures so as to show them ... But still, in my opinion this word was too difficult for children of this age.

-- OK, I will reword my question: suppose you have to do the same activity would you suppress the word stilt of it?

-- Hem ... maybe not ... because I think they got a good idea of what stilts are.

-- What would you change then?

-- Maybe looking up in the dictionary. Some children could do it, but others no. Maybe I would just keep the pictures...

-- Then, would you say you taught in your pupils' ZPD?

-- Ah yes! Maybe the sequence I thought faulty is all right after all.

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And then the discussion went on focussing on the reasons why she was in the children's ZPD.

In fact many interactions resulted in the students analyzing their sequences differently as a consequence of the researcher's questioning. For instance, they might have at first the feeling that the task was too difficult because the children took time to do it or did not participate. Or else they thought that the task was perfectly in the children's ZPD because they would solve the problem easily, but when asked what the pupils had learnt they would become aware that they had in fact learnt nothing at all and that the task was too easy for them. Another participant realized that she did not really master the concept of probability she wanted to explore with her young pupils so that although she put them into action with a dice nobody understood the activity. At first, she thought the task was too difficult for the children; but after discussing with the group she became aware that the activity did not have a clear goal. Since participants had decided by themselves the group composition they felt at ease to discuss their difficulties.

Discussion

Students showed a great awareness of their teaching forces and flaws and were deeply interested in doing so. Although they were eager to get a definite answer as to whether they had taught or not in their pupils' ZPD in the researcher's opinion, they were quite as much interested in the process of thinking about the matter. At this point, as professors rather than as researchers, we felt in our students' ZPD, because our intent was to help them reflect upon the concept of ZPD. But we were also unsettled in a way, since these discussions had extended the limits of the zone of proximal development and prompted us to ask ourselves when precisely could we consider that a pupil or a student had reached his or her level of potential development. If the child does not give

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a correct answer at the end of the activity, was the teacher in his ZPD or not? Or could it be that he was but that the child needed time to internalize, on an intrapsychic level what he had learnt during the interaction, on an interpsychic level? As Tudge and Scrimsher (2003) put it, the ZPD emerges from the collaboration between the child and the adult and while working in the child's ZPD they both change during the process. If this is so, we can consider that we taught in our students' ZPD. The most dramatic change we went through is that we became really aware of why teachers aim so much at obtaining "right answers" from their pupils rather than help them to think by themselves. Indeed, we seem to have a natural tendency to know in advance what our students should think and say. And, in a way, this is a good thing, since we have to guide them ... but the questions are "how much" and "where to"?

We consider that our research method constitutes a new teaching method since university students are more often exposed to knowledge than asked to reflect, although there is a growing tendency to favour reflection in future teachers education (Correa Molina, Chaubet et Gervais, 2011). From the researchers' point of view, the exchanges are quite rewarding since they can observe directly the changes resulting from the discussion. But if many interactions were situated in our students' ZPD, one cannot say that the modeling part of our project was a success. Although some students would tell the researcher "Ah, I feel you are in my ZPD", they did not see the analogy between our interactions and their teaching. This might be due to the fact that these discussions took place during the first year of the project. Nevertheless, from the students' point of view, the method seems to be very satisfying since they are very interested in discussing their practice and several of them told us that this first discussion session will definitely help them to become better teachers, saying: "This should not simply be a research project, it should be a course offered to all the students in education".

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