The Joint Action Theory in Didactics
A case study in videoconferencing at primary school

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Abstract: In this paper, we aim to show how the Joint Action Theory in Didactics (JATD) may contribute to the construction of a science of instructional practice. In this perspective, we propose two concepts: the student's twofold semiosis and the teacher's equilibration work, which allow us to understand the instructional practice and the learning process in the same conceptualization. We illustrate these concepts and our video research methodology with a case study in videoconferencing at primary school (Second Language Learning). We attempt to clarify how this technology-enhanced learning environment enables a reconstruction of the learning situation in a specific inquiry process, requiring a particular teacher's equilibration work and a specific student's entitlement. We eventually argue that the Joint Action Theory in Didactics could contribute to the development of Learning Sciences research.

Introduction

In this paper, we address three major issues.

First, we concentrate our analysis on practice, and particularly on *instructional practice*. Sharing Koschmann's question "How… do we begin to construct a real science of instructional practice?" (Koschmann, 2011, p. 6), we try to provide some elements to contribute to this construction. In that perspective, we sketch a theory, the Joint Action Theory in Didactics (Sensevy & Mercier, 2007; Sensevy, 2011a; Sensevy, 2011b) that we describe according to its main lines, offering a glimpse into its structure and some of its elements. This theory aims at linking teaching and learning and postulates that one cannot understand learning practices without understanding related teaching practices.

The second issue of our paper concerns the way the teaching/learning relationship can be effectively mediated by technology. In order to work out this issue, we present how a specific technology-enhanced learning environment, videoconferencing, can foster teachers and students' activity. We give some elements of a comparative analysis between an "ordinary class" and a "videoconferencing class", where English is studied as a Second Language at primary school, grounded in the categories of the Joint Action Theory in Didactics previously described.

The first two issues are interrelated in so far as the purpose of this paper is both to emphasize videoconferencing as a method to study and document didactic transactions in relation with JATD.

The third issue of our paper seeks to show that French Didactics Concepts, and particularly the Joint Action Theory in Didactics, could contribute to the Learning Sciences research.

The Joint Action Theory in Didactics: origin and main principle

The Joint Action Theory in Didactics (JATD) stems from French Didactics (in particular, Brousseau, 1997; Chevallard, 2007; Laborde, Perrin-Glorian & Sierpienska, 2005). In this perspective, we will refer to what could be termed the first theoretical principle of French Didactics. This principle states that in order to understand a didactic activity (i.e. an activity where someone teaches and someone learns), one needs to understand a *system*, the *didactic system*, which is a system of three subsystems, the subsystem of Knowledge (the piece of knowledge in question), the subsystem of the Teacher, and the subsystem of the Student. By arguing that the didactic system is an *undividable* system, we emphasize the fact that all theorisation in didactics rests on the fact that one cannot understand the teacher's behaviour without simultaneously understanding the student's behaviour and knowledge structure and function. It suffices to replace the word "teacher" with the words "student" or "knowledge" in the preceding sentence to obtain three assertions that constitute the core meaning of this framework.

The Joint Action Theory in Didactics: an epistemological background

In order to understand the meaning-making process in practices, we have to understand the logic of practice on which people base their behaviors. In our conception, acting according to the logic of a practice is to be able to master a specific language-game in a particular life-form (Wittgenstein, 1997). In order to master this language game, one has to be able to produce and decipher signs of various kinds in an appropriate way. From that perspective, Mead (1934) provides us with a remarkable conception. Indeed, he considers that a *social act* is an act in which certain features of a participant's conduct are taken as "stimuli" by her partners, and reciprocally. The joint action thus rests on what we may call the *semiosis of others*, the deciphering of actions – verbal as

well as bodily – that other persons carry out in a given situation. In a similar way, Dewey argued that "things gain meaning by being used in a shared experience or joint action' (Dewey, 1916/1985, p. 20)". We contend that the teaching-learning process could contribute to the paradigm of joint action (Clark, 1996, Sebanz et al., 2006).

The Joint Action Theory in Didactics: some theoretical tools

The fundamental grammar of the didactic game

We describe the didactic transactions (1) (Dewey and Bentley, 1949) between the teacher and the students as a game of a particular kind, a *didactic* game. What are the prominent features of this game? It involves two players, A and B. B wins if, and only if, A wins, but B must not give A the winning strategy directly. B is the teacher (the teaching pole). A is the student (The studying pole). This description allows us to put forward that the didactic game is a collaborative game, a *joint* game, within a joint action. But what kind of joint action? If we look at a didactic game more carefully, we see that B (the teacher), in order to win, has to lead A (the student) to a certain point, a particular "state of knowledge" which enables the student to play the "right moves" in the game, which can persuade the teacher that the student has built the right knowledge. At the core of this process, there is a fundamental condition: in order to be sure that A (The student) has really won, B (The teacher) has to be *reticent.*

Brousseau (1997) coined the "Topaze Effect" idea that emphasizes this peculiar point. In a dictation, concerning the sentence "les moutons…", the teacher Topaze wants the students to accurately write down the plural of the noun "mouton" (*sheep*), which is marked by a final "s" in French. So the teacher clearly pronounces the "s" (mouton*sse*) at the end of the word "mouton*s*" (in the normal French pronunciation, this final "s" is not pronounced), and the students automatically write down the "s". One can argue that the teacher cheated in this didactic game, and that the students did not really win the game of writing down the plural of the noun "moutons" accurately. A fundamental rule of the didactic game has not been followed: the teacher has to be tacit, *reticent*, in order to let the student build *her* proper knowledge. The student must act *proprio motu*, the teacher's scaffolding must not enable the student to produce the 'good behaviour' (i.e. to put an "s" at the end of the word "mouton") without calling on the adequate knowledge (i.e. the rules of plural agreement). This *proprio motu* clause is necessarily related to the *reticence* of the teacher. We argue that in all kinds of teaching (i.e. direct instruction or inquiry-oriented teaching), the teacher has to be reticent in order to be sure that the *proprio motu* clause is respected, that the students' behaviors are grounded on actual knowledge, the knowledge involved in the teaching/learning process. Thus, we consider that the *proprio motu* clause and the teacher's reticence compose the general pattern of didactic transactions and give them their strongly asymmetrical nature.

In order to characterize the teaching-learning process more deeply, we use the notion of Learning Game. A Learning Game is fundamentally a joint game, in that it refers to the teacher's game on the student's game as it occurs *in situ*. In the following, we focus on some of the concepts we use to describe a Learning Game and to better understand the instructional practice and the learning process in the same conceptualization.

The didactic contract and the milieu

In order to understand joint action in the didactic game, we have to identify the game *thought style*, which functions as a background to the didactic transactions. Concerning the concept of thought style, we rely on Fleck's contention (1979) according to which a thought style is viewed as "a readiness for directed perception".
In our framework, these thought-style properties are taken into account in the notion of *didactic contract* (Brousseau, 1997), which is a system of habits between the teacher and the students. These habits entail particular expectations (either from the teacher or the students), with each agent attributing some expectations to the other(s).

A good example of the cognitive strength of the didactic contract can be found in the research paradigm called "the Captain's age" (Schubauer-Leoni and Perret-Clermont, 1997). Researchers submitted "absurd problems" to students in primary education (i.e. a boat has 3 veils and 42 crew members, how old is the captain?). Surprisingly (at least for the researchers), a great proportion (80–95 %) of the students gave an answer (by using the numbers given in the problem) and only very few of them replied that it was impossible to respond. This example makes us understand what a didactic contract is. Every time they had to solve a problem, students had to use the same set of procedures. First, they had to give an answer. Second, in order to 'produce' this answer, they had to use the numbers provided in the particular problem. Third, these numbers had to be 'associated' thanks to the last 'means of calculation' (addition, or subtraction etc.) they had learnt.
It is important to note that the didactic contract, as a system of expectations, is largely implicit: it functions as a common background fostered in everyday didactic joint action, a thought style attached to the 'problem solving' game. In a didactic institution, such an institutional contract has to be modified all along the learning-teaching process.

We can theorize this change by introducing the notion of *milieu* (Brousseau, 1997), which can be described as a system of physical and symbolic objects that is elaborated to constitute an *antagonistic system* to

the previously taught system. In that perspective, the didactic contract can be seen as a way of assimilating, in the Piagetian sense (Piaget, 1975), the didactic experience. In our previous example (the Captain's age), the contract, as background knowledge, 'enables' the students to answer the problem. But when new elements that the joint action cannot directly assimilate are brought into the milieu, they bring a kind of *resistance* to the joint action, which entails that the didactic contract has to be changed. In that case, the assimilation of the new milieu requires the accommodation (*Ibid.*) of the contract.

As can be understood from the previous description, the relationship between contract and milieu holds a prominent position in JATD. Indeed, we argue that in order to characterize the didactic joint action, one has to identify how the students orient themselves, either by enacting the didactic contract habits or by establishing epistemic relations with the milieu. It means that empirical studies have to reveal what kind of dialectics is built between the "contract-driven students' orientations" and "the milieu-driven students' orientations". We use the expression *didactic equilibration* to designate the search for an adequate equilibrium between these two kinds of orientations in the transactional didactic process, and we see the teacher's action as the production of such an equilibration work.

The student's twofold semiosis process and the didactic equilibration

In JATD, the student's activity is mainly thought of as a semiosis process, of two kinds. First, the student has to produce a first semiosis, which corresponds to the deciphering of the signs of the milieu that are non-intentional signs. But this first kind of semiosis is enacted against the background of previously taught knowledge as it has been structured in the preceding didactic joint action, the didactic contract background. However, in the joint action, the teacher may orient the student's action in the milieu in a more or less reticent way. The signs produced by the teacher to orient the student in the milieu refer to what we call the second semiosis. In the *first semiosis*, the student has to decipher the non-intentional signs of the milieu. In the *second semiosis*, she has to decipher the intentional signs that the teacher provides in order to orient her in the milieu.

With respect to the didactic equilibration we refer to, we can therefore determine two main ideal-typical relationships, which one can consider as two poles of a gradient.

In the first typical relationship, *the contract can be seen as an auxiliary to the milieu*. For example, in a reading session, the teacher may want the students to be able to read the text accurately, in a text-centered process, in which the students discover the meanings of the text in a first-hand relationship. In order to foster such an inquiry, the teacher can rely on the didactic contract, but as a kind of orientation through the milieu. In this kind of relationship, the semiosis process is mainly of the first sort. The students have mostly to decipher the non-intentional signs of the milieu.

In the second typical relationship, *the milieu can be seen as an auxiliary to the contract*. For example, in a reading session, the teacher may want the students to read a certain text, but this text, as a milieu, is merely a way of presenting some meanings the teacher intends to make the students recognize. The core of the didactic process does not lie in an inquiry concerning the text, but in a system of meanings that the teacher tries to reinforce within the contract. The most important thing in this learning-teaching process is the teacher's discourse or conduct, to the extent that the text (milieu) could be removed from the transactions without compromising the learning at stake. In a way, the milieu is a pretext. In this kind of relationship, the semiosis process is mainly of the second sort. The students have mainly to decipher the teacher's intentional signs.

An actual didactic process generally mixes these two ideal-typical relationships, according to the characteristics of the knowledge in question. But it is possible to draw a line between contract-oriented transactional systems and milieu-oriented transactional systems, and, in doing that, to acknowledge different strategic systems in the teacher's action.

An outline of the methodological approach: Video Research

As we have seen, our theoretical viewpoint focused on the analysis of the joint action between the teacher and the students gives a major importance to the production and the deciphering of signs, in the semiosis process, which is partly a semiosis of others. The teacher has to identify the signs provided by the students, and, in what we have called the second semiosis, students have to recognize the teacher's intentional signs. Moreover, the knowledge involved is most of the time constituted by a symbolic system the students have to acknowledge and practice. For these reasons, we ground our enquiries in the video recording of teaching/learning practices, and we include our approach (Tiberghien & Sensevy, 2012) in the methodological paradigm of the Video Research (Goldman et al., 2007). As we have argued elsewhere (Tiberghien & Sensevy, 2012), video recordings enable to keep the *analogical* dimension of the situations with their specificities and their infinity of information (Dretske, 1981). Above all, as Goldman & McDermott (2007) state, it makes communication visible, and makes it possible to account for embodied *instructional communication*.

An empirical study: comparing an ordinary situation to a situation involving synchronous exchanges via videoconferencing

The empirical study provided here is based on the comparison of two episodes extracted from two different corpuses used to analyze the way English as a Second Language (ESL) is taught and learnt in primary schools in France. The first episode comes from a five-lesson teaching unit implemented in an ordinary class composed of eighteen 5th graders. The second episode comes from a videoconferencing session during which four French students interact with four English students at lunchtime under their teacher's supervision.

In both situations, the students play a familiar game similar to the well-known "who is it" game. This famous game is a two-player game in which each player secretly and simultaneously selects one character and then tries to be the first to guess who her/his opponent picked. In both classes, this game has been turned into a "what monster is it" game as the secret character to uncover is not a person but a monster. For the "monster" game, each teacher has developed specific documents and slightly changed the original rules. However, beyond these differences, the general knowledge involved is very similar in each class. It corresponds to the students' ability to ask and answer questions so as to discover the secret monster, which is the monster chosen by another student.

In the ordinary class, the game is organized as follows: one student - here William - plays against the whole class. It means that William chooses a monster his friends have to identify, asking him questions in English he has to answer in English as well. In this class, the French students have to be able to produce and understand questions and answers in the target language to play the game. In doing so they will respect an overarching didactic contract that strongly characterizes ESL classes at primary level: the "use of the target language" contract (Gruson, 2009), thus situating themselves in the communicative paradigm.

For the videoconferencing session, the French and English students play against each other. In the selected episode, one player, a French student called Emma, asks questions in French to Sophie, an English student, who replies in English. In contrast with the ordinary class, we note that both French and English are being used in the videoconferencing session. Indeed, one vital ingredient of the use of videoconferencing, which transforms teaching and learning a foreign language, is that, during videoconferencing sessions, both French and English students have to learn the target language. Consequently, these sessions are in essence bilingual sessions during which both languages are supposed to be used equally to solve the problem in question – in this case to guess the secret monster. These bilingual sessions are based on a fundamental principle that could be termed the "equal benefit" principle meaning that both partners have to benefit equally from the exchanges (Gruson, 2010). This principle, as we will show, has a strong impact on the teachers' and the students' actions: it not only modifies the didactic milieu but also the type of didactic contracts that occur in the ESL class.

To conclude the presentation of the two situations, we have to keep in mind that, for the selected episodes, the language activities involved in each class are different. In the ordinary class, the students will have to practice both receptive and productive activities in the target language whereas, during the videoconferencing session, the main knowledge in question consists in understanding the target language. If both teachers agree on focusing on a receptive activity in that episode, it is because they want to take advantage of the native speaker students' "expertise" in their own language and "use" them as authentic references for the target language.

What happens *in situ*

In the ordinary class

This episode takes place at the beginning of the game just after William designated Linda to ask him a second question.

Table 1: Transcripts and screen captures, episode 1.

Linda: *how many nose* ***PT1 (2):*** *how many noses has it got ? + how many noses has it got?* ***Linda:*** *how many noses has it got?*	***William:*** *it's one*	***PT1:*** *it has got* ***William:*** *it has got one*	***William:*** *nose* ***PT1:*** *nose* ***William:*** *nose*
			

The teacher makes a gesture to encourage Linda to repeat the whole sentence and correct her mistake. PT1's gaze is directed towards Linda (not visible on the photogram).	William looks at the document on the board to check how many noses the monster he has chosen has. He answers with an incorrect sentence limited to the necessary information: the number.	The teacher provides William with the right form, and makes a gesture to encourage William to correct his sentence. PT1's gaze is directed towards William. William repeats the verbal expression and the number.	PT1 touches her nose to encourage William to complete his sentence. PT1's gaze is directed towards William. William produces the word "nose", which PT1 repeats to produce a correct phonological model. William reproduces PT1's pronunciation.

The way Linda and William produce their sentences clearly shows that they limit their productions to signifying elements not bothering to utter complete sentences. In doing so, they comply with the milieu, which doesn't make the production of complete sentences necessary. Indeed, in everyday life, youngsters playing the same kind of game would most likely do the same: ask a three word questions "how many noses?" and answer with a number: one. However, we observe that William tries to produce a longer answer "it's one". He does so because he is familiar with the expectations of his teacher whose gestures and reformulations remind her students twice that she wants them to produce long and correct sentences.

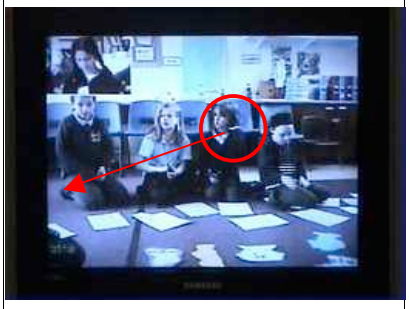
In the current learning game, we observe that the teacher's reticence is quite low: PT1 provides her students with the verbal expression "has got", which they repeat although she does not ask them to do so explicitly. In fact, they repeat PT1's words or sentences as the result of the way they interpret the signs she produces. As a consequence, the students do not act *proprio motu*: their oral productions are strongly oriented by PT1's verbal and non-verbal actions; they are the result of the system of habits fostered previously. In that episode, as we explained before, the milieu is not resistant enough: using "has got" is not necessary to play the "what monster is it?" game. As PT1 has given the winning strategy directly, she cannot know if the students have really understood the use of "has got". The milieu being too weak, the didactic contract allows the students to assimilate it.

Consequently, in this first episode, we can say that the milieu is first and foremost an auxiliary to the contract and that the on-going semiosis process is mainly of the second sort. In order to win the learning game, the students have to orient themselves mainly by deciphering the contract signs afforded by the teacher. In that case, we can state that the teacher's equilibration work is contract-driven.

In the class using videoconferencing

This episode takes place in the middle of the session. Emma produces her first question after two other questions have been asked.

Table 2A: Transcripts and screen captures, episode 2.

Emma: est-ce que ton monstre a cinq oreilles ? *(Does your monster have five ears?)*	***PTE:*** cinq oreilles++ combien ça fait ? cinq oreilles ? *(five ears++ how much is it? Five ears?)* ***Sophie:*** does your monster have five ears?	***Sophie:*** no our monster hasn't got five ears
		
Emma asks the next question. She is looking straight at the camera so as to establish eye contact with her English peers. She pronounces her	PTE repeats the sentence key-elements, "five ears", twice to help her students understand. Sophie touches her ear and then produces	Sophie then looks at the camera to answer Emma's question. As Emma, she makes efforts to articulate and pronounce clearly to

question slowly and clearly.	the question, which she addresses to her teacher to check its validity. Her gaze is directed towards PTE whose knee is visible in the left side corner of the screen.	make sure Emma will understand her answer. Emma is concentrated on the document on her lap.

Table 2B: Transcripts and screen captures, episode 2.

Emma: j'ai pas compris *(I didn't understand)* ***PTF:*** tu le dis (*Say it)* **Emma:** repeat please ***PTF:*** je crois qu'ils ont pas bien entendu Emma vas-y *(I think they haven't heard Emma go on)*		In spite of Sophie's efforts, Emma hasn't understood the answer, which she first tells PTF. She turns towards her teacher who is standing next to her and whispers to him. The latter does not repeat the answer but tells her to ask Sophie to repeat, which she does.
Sophie: no our monster hasn't got five ears ***PTF:*** he hasn't got five ears +++ à vous ! *(your turn!)*		While Sophie repeats the answer for the second time, Emma is looking intensely at the screen to make sure she will understand this time.

In this episode, the on-going learning game is quite different. The milieu is much more complex as the students have not only to interpret the signs produced by their teachers but also those produced by their peers in the same room and across the Channel. However, as in the first episode, answering the yes/no question formulated by Emma " Does your monster have five ears?" can be reduced to the production of one isolated word, here, 'yes' or 'no'. Yet, if we examine the answer produced by Sophie, we observe that she utters a long answer "no our monster hasn't got five ears" even if Emma only needs to understand the first word to get the required information and make progress in solving the problem. In a very different way from what happens in the ordinary class, the production of long and correct sentences is not enforced by the teachers' expectations but by the English student's desire to provide the French students with a model on which they will be able to rely when they have to produce their sentences in English.

Concerning repetitions, we can observe that if the question is repeated here it is because Emma asks Sophie to do so as she was unable to pick up the clues (no / hasn't) included in the milieu (the answer) to get the sentence meaning. In videoconferencing sessions, repetitions are usually due to technical problems that often disrupt virtual communication. This can also explain why both teachers, PTE at the beginning and PTF at the end, repeat after the students.

If we look closely at Emma and Sophie, we observe that they really enact a first-hand relationship to the knowledge involved. First, as shown in the second picture, even if Sophie tries to find some support from her teacher to make sure she understood the word "oreille" correctly, she produces it by herself. As for Emma, pictures 1 and 5 clearly illustrate how concentrated she is and willing to decipher the signs of the milieu: the words produced by Sophie. In this second episode, PTF's reticence is high when he encourages Emma to find in her own linguistic resources the word to ask Sophie to repeat. In that case, the assimilation of the new milieu requires the accommodation of previous knowledge: the contract has to be changed.

To conclude, we can first put forward that, in this second episode, the students' actions are mainly oriented by the milieu and by a semiosis process of the first sort. Secondly, we can argue that by providing another kind of didactic game, videoconferencing sessions have a strong impact on the dialectics between the "contract-driven students' orientations" and "the milieu-driven students' orientations". As a consequence, the teachers' equilibration work is very specific. It consists mainly of enabling the student to confront the milieu, within an appropriate guidance, which does not rest on the unveiling of the teachers' epistemic expectations.

Discussion

It seems to us that the case studies we theorize in this paper may lead to some exploratory conclusions and implications.

The need for a theory of instructional practices

We argue that there is a need for a transactional theory that holds together teaching and learning. In our opinion, such a theory cannot ontologically separate teaching from learning. If we describe the teaching/learning process

as a way of building a common background, relating to the piece of knowledge involved, between the teacher and the students, and renewing it as this process unfolds, we have to see learning and teaching in transactions. That is to say that, if there is a fundamental asymmetry between the teacher and the students, due to their different relationship to the subject matter, the way students learn fundamentally depends on the teacher's instructional moves. In what we termed "Equilibration work" a teacher may obtain dramatically different learning depending on whether she carries on a "contract-driven" teaching process or a "milieu-driven" teaching process. Thus a theory of instructional practices has to account for these differences, and show how a "milieu-driven" instructional practice may enact a kind of Deweyan inquiry (Dewey, 1938/2008), in which students' certainty will be based on a first-hand relationship to the milieu and the knowledge in question. In that way, we agree with Koschmann's contention according to which "Deweyan inquiry, when successfully carried out not only effects a change in the problem solver (what psychologists treat as "learning") but also leads to a reconstruction of the problematic situation that led to the inquiry in the first place" (Koschmann, 2011, p. 12). We argue that we can see such "a reconstruction of the problematic situation" in our videoconferencing case study, in which the teachers' equilibration work allows the students to deal with the foreign language in a way they would not be able to achieve in the initial problematic situation. We account for this reconstruction by using our concept of learning game, which makes us see learning as the consequence of the teacher's game on the student's game in the milieu.

In that way, JATD, by considering learning and teaching as the process and the outcome of a joint action, does not ontologically separate the transactional process that occurs between the teacher and the students from the epistemic process within which the knowledge involved is made available. Knowledge itself is provided in a transactional way. It seems to us that such a conception could meet the distinction operated by Greeno (2001, 2011) between the systemic and semantic aspects of interaction. Systemic principles "involve ways in which students are positioned in interaction" and semantic principles "involve ways of achieving coherence of information, including alignment of the situation with the goal of the task (Greeno, 2011, p. 48). As Greeno put it, "these two kinds of principles are inherently interactive" (2011, p. 49). It seems to us that inquiring how the teacher's work (in particular what we refer to as "equilibration work") may enact a relevant relationship between systemic and semantic aspects in learning could be a promising avenue of research. It could be one of the goals of JATD, within a transactional perspective.

Technology-enhanced learning environment and JATD

We argue that technology-enhanced learning environment such as videoconferencing may offer regular opportunities to modify the very logic of teaching/learning practices. The reconstructed situation allows the students to position themselves as knowledgeable persons, entitled to produce relevant sentences in their mother tongue. We hypothesize that this positioning (Greeno, 2001, 2011; Harré & Van Langenhove, 1998) has a strong influence on the students' epistemic conduct.

One could assert that it has been done by augmenting the "degree of authenticity"of the situations. But the question is not so much that of the degree of authenticity as that of the *nature* of this authenticity. According to us, the empirical case study we provided in this paper is instructive from this point of view. By uttering *complete* sentences in their mother tongue, students do not meet the features of an "everyday situation", in which *only some words* could be sufficient to win the "monster game". But winning the "monster game" does not mean winning the didactic *learning game*, in that it does not afford relevant opportunities to learn. In the case study in question, as each student is entitled to provide other "foreign" students with accurate linguistic forms, the completeness of these forms can be seen as a warrant for better learning. In that way, the "authenticity" of the learning game is not an everyday life authenticity, it's a *didactic* authenticity – that one could see as the most rewarding authenticity in a learning situation.

Consequently, we argue, on the one hand, that technology-enhanced instructional practices have to enact counterfactual learning games, as we have seen in our case study, in which the logic of the situation itself puts the students in didactically authentic and relevant situations, that the teacher's equilibration work may concretize. On the other hand, our second case study clearly illustrates that videoconferencing can greatly enhance the transactional possibilities of the learning situations. Obviously this small-scale study represents a modest contribution to the debate about CALL research and the question of the effectiveness of videoconferencing. Multiple factors such as the learners' level, the teachers' expertise, the setting and the communicative situations have a significant effect on students' learning. Consequently, more research on videoconferencing and language learning in primary education needs to be conducted so as to investigate the specificity of the primary context and identify examples of good practice. Whatever could be the results of these investigations, we strongly believe that studying technology enhanced learning will lead us to reconsider the potentialities of JATD.

Finally, as we argued at the beginning of this paper, JATD stems from French Didactics and relies on it for its main concepts. But it seems to us that JATD represents an emerging paradigm for the educational sciences that could contribute to current research in the Learning Sciences Community, and more particularly with this

research, to CSCL. This research, according to us, leads to a new vision of the relationship between teaching and learning, a new vision of what could be a science of instructional practices grounded in a deep understanding of what learning is.

Endnotes

(1) In our work, we use the word "transaction" as Dewey elaborated it in his late work with Bentley (Knowing and the Known), in which they explain that the notion of transaction differs from the notion of interaction in the way it emphasizes the fundamental dynamics of activity.

(2) In the transcriptions, PT1 designates the teacher in the first episode, PTF the French teacher and PTE the English teacher in the second episode.

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