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Multimodal and Multisensory Approach to Teaching and Learning Vocabulary

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Abstract.
The paper explores the impact of the use of a dialogical and multimodal approach to teaching and learning vocabulary on young learners.
It draws on a classroom research project that investigated the use of the dialogical inquiry approach informed by the philosophy for children. It also calls on a multimodal and multisensory approach that makes use of haptic technological interfaces that allow for the learning experiences to go beyond the use of audio-visual senses. The aims of the project were twofold: to develop and implement a dialogical approach to teach vocabulary and, more specifically, the semantic relationship between words; and to examine the impact of using a multimodal and multisensory approach with the use of digital technologies on the learning process of young learners. The presentation will focus on the later aim and, more specifically, on the possible impact of the adoption of a multimodal and multisensory approach on the vocabulary learning process and how it might influence the learners' experiences and behaviors. It will conclude with a discussion about the need to understand that the use of multimodality and multisensory as an approach to enhancing the teaching and learning of vocabulary is complex, and that it needs to be understood in terms of an ecosystem where all elements of the system are interrelated. It is the interplay between the different multimodalities and the multisensory affordances offered by the emergent haptic technologies that contribute in enhancing the learner's learning process and, in turn, the acquisition of vocabulary knowledge.

Keywords: technologies; semantic relations; haptic affordances; ecosystem; learning

1 Introduction

The Lexical Research Community (LRC) is a dialogical, multimodal and multi-sensory teaching approach to teach the notions of meaning links between words (synonymy, antonymy, thematic words and family of words).
The development of this didactic approach is the result of a collaborative research-action partnership with teachers and their elementary students in a Canadian school in a multilingual context, and university researchers. The project was made possible thanks to the financial support of the Social Sciences and Humanities Research Council of Canada (SSHRC). The main goal of the research project was to develop a didactic approach that favors the use of the spoken word as a tool in the service of meaning-learning, and to appeal to the new multimodal and multi-sensory possibilities offered by new mobile and digital technologies.

At first, the article explores the theoretical framework that has enriched the development of the LRC approach. This is followed by the presentation of the on-line pedagogical resource "Lexical Research Community" which allows access to the various resources as pedagogical support to enable the implementation of the LRC in the primary classroom and secondary school in the context of teaching French in a minority and plurilingual context and in a second language in French immersion programs.

2 Theoritical Framework

2.1 What research tells us about lexicon teaching

Research shows that teachers focus their lexical work more on one-off exercises (Calaque, 2000) or text lists prescribed by textbooks (Anctil and Charron, 2006). In addition, the literature notes a weak emphasis on systematic teaching of the lexicon (Dreyfus, 2004) and that teachers make very little use of the potential of the oral as a tool at the service of lexicon learning (Calaque, 2000) and dialogical pedagogical activities (Fisher and Doyon, 2000). However, research on the teaching of the meaning of words (eg, Nonnon, 2008) indicates that discursive approaches are preferred for the development of the lexicon. In previous work, Mazière (1993) also recommended using personal practice of the pupil's language and using the word's potential to work through the meaning of words. Although there are certain dialogical didactic approaches for teaching vocabulary, such as those advocated by Marzano (2004), it is limited to acquiring vocabulary (number of words) rather than deepening the meaning of words. Literature also shows us that knowledge of a word is multidimensional (meaning, form, usage) and gradual (to understand it for use in different contexts) (Aitchison, 2012). Thus, the adoption of dialogue as a pedagogical approach becomes essential in order to allow students to coconstruct their understanding of the meaning of a word. For example, for students, the word "succeed" is probably not new to them, but what does this word mean, its nuances, its opposite and what meaning does it share with other words (success, fail , exam)? The knowledge of the words requires an exercise of deepening on the part of the pupils and, more particularly, "the relations which unite the words is important to structure the semantic memory, because it is the connections which make that the words are available and understood in situation of oral or written communication "(Lavoie, Pellerin, Girard, 2017, p.15).

2.2 An approach inspired by the philosophical research community

The name and the didactic approach of the Lexical Research Community (LRC) are inspired by the Philosophical Research Communities (PRC), a pedagogical model created by the philosophers and pedagogues Matthew Lipman and Ann-Margaret Sharp under the name of Community of Philosophical Inquiry (CPI) (Lipman, Sharp and Oscanyan, 1980). This pedagogical approach is based on the principle that education helps children understand the meaning of what they are learning. The CIP approach advocates the autonomy of the child and the practice of dialogue (Sasseville and Gagnon, 2012).

2.3 Discursive approaches to teaching lexicon

In addition to the dialogic approach of children's philosophy, the discursive approaches of teaching lexicon concerning the teaching of the links of meaning guided the development of the LRC

approach. These approaches give a crucial role to the communication process in the constitution of social reality and in lexical development and deepening. Thus, according to these approaches, it is better to learn words in context of interaction than to learn words in isolation. The research works of the authors Plane and Lafourcade (2004) also state that semantic work is initiated by the analysis of the verbal language of the learner: "semantics can only have for object those mental representations triggered by and apprehended at through the verbal material that gives them body "(p.52). Thus, learning the lexicon implies a relationship between the learner and his experience of words.

In the context of pedagogical practices informed by discursive approaches, the active participation of pupils is essential. It is important to note that this participation is not limited to speaking only (Van Compernolle and William, 2013) but includes active listening, observation, nonverbal reactions, and artifact production during discussion. According to Goodwin (2007), the interaction develops thanks to the mutual reflexivity of the speakers and the receivers, as both actors guide the exchanges.

Mondada and Pekarek Doehler (2004) recall that learning the concepts and the level of language skills are inseparable from the plurality of social and cultural contexts in which learners live. The student already has a representation of words determined by his age, his social background, his personality, his origins and his first language. Thus, the context influences the interaction (Van Compernolle, 2015) and the vocabulary of a person. Some research indicates that children from economically disadvantaged backgrounds have a more limited vocabulary than children from socioeconomically advantaged backgrounds (Hart & Risley, 2003). The research team wanted to realize this didactic approach in a context where the linguistic, cultural and migratory plurality of learners would contribute to the sharing of lexical networks so that they enrich each other through dialogue and peer listening. As Plane and Lafourcade (2004) point out, an important part of the understanding of meaning relationships between words is the discovery of the links between words, the world, and speaking subjects. The LRC takes the position that to discuss the meaning of words with all students allows the co-construction of meaning.

2.4 The concept of multi- modality and multi- sensorality and the new digital and haptic technologies

Emerging research in cognitive science and neuroscience evokes the importance of multimodal and multi-sensory learning. The concept of multimodality refers to the deployment of several modalities simultaneously (eg visual and audio) (Jewitt and Kress, 2003). According to the results of a meta-analysis (Cisco, 2008), the addition of modalities such as the visual to the audio would contribute to significant gains in learning basic structures as well as in learning higher order learning. Moreover, according to this same research, when students are engaged in learning tasks that use a multimodal approach, their performance surpasses that of students engaged in single-mode tasks.
The emergence of the use of new digital technologies with a touch screen in the classroom is also contributing to access to new multimodal and multi-sensory possibilities previously unimaginable (Pellerin, 2018).
According to Pellerin (2017) the use of spoken language combined with the potential offered by tactile tablets (voice, images, sounds, tactile and sensory interactions with screen) allow students access to different modes of representation and expression. In addition, these new multi-modal and multi-sensory possibilities allow the collection of digital traces (recording of voice and tactile interactions with the screen) which make it possible to "make visible both the internal dialogue as

well as the actions undertaken; that is, what he thinks and does when he performs the task, but also how he engages in processes of metacognitive self-regulation throughout them "(p.224).

2.5 The steps of the LRC process

The goal of the LRC is to develop discourse skills while learning lexical notions in multimodal and multi-sensory ways. In addition, it aims to develop metacognitive thinking skills on the part of students about the words they encounter in their oral speech and to equip them to explain their thoughts about the relationships these words have with the spoken word.

This process takes place in five stages: 1- philosophical discussion and active listening; 2- collaborative analysis of the definition; 3- the modeling of lexical strategies; 4- the realization of the lexical heuristic maps (paper and digital); and 5- the collaborative dialogue on the links of meaning.

Preparatory step
Some preparatory knowledge is necessary for the smooth development of the didactic approach of the lexical research community. We propose activities on the notions of synonymy, antonymy, words of the same family and thematic words, and on the structure of an entry of a word in the dictionary. The activities take place over 4 periods of approximately 50 minutes. (Http://crl.recherche.usherbrooke.ca/index.php/etape-0/)

Step one: Philosophical discussion of the meaning of a word
The group is split in two: one part discusses in circle, and another observes the exchanges outside the circle. The discussion is captured on video. After 15 minutes, the groups change roles. At the beginning, the teacher provides a primer to start the discussion on the word of the day. The teacher guides the exchanges. It uses a discussion guide that contains questions to guide the discussion of the relationship between words. As for the observers, they have a lexical heuristic card to record the words heard during the discussion. (Http://crl.recherche.usherbrooke.ca/index.php/etape-1/)

Step two: Collaborative analysis of the discussion
After the philosophical discussion, the teacher encourages students to formulate a definition orally. Then, they consult the dictionary and enrich the information by adding, for example, their sentence-example or by nuancing the proposed definitions. This moment is also used to explain the different parts of a dictionary entry (word class, abbreviation, number of meanings, etc.). Our observations show that the philosophical discussion of the word of the day positions children in a critical perspective against the definitions proposed in the dictionary. (http://crl.recherche.usherbrooke.ca/index.php/etape-2/

Step three: Modeling of lexical strategies
The teacher chooses a video clip in which we hear different words with links of various meanings. This excerpt is taken from the recording of the philosophical discussion (step 1). She expresses her metalinguistic reasoning by using the lexical strategies of the lexical decision tree. The metacognitive and metalinguistic questioning by the teacher serves as a support tool to guide the student in his cognitive process and the appropriation of the notions of the links of meaning. Together, as a lexical research community, students and the teacher can explain lexical strategies. (Http://crl.recherche.usherbrooke.ca/index.php/etape-3/)

Step four: Realization of the heuristic lexical map
Students pick up their observer cards used in the philosophical discussion (Step 1). They try to categorize the words noted according to the four different semantic relations (thematic words, words of the same family, synonyms or antonyms) on the heuristic lexical map. The lexical heuristic map can be completed on paper or by means of a video capture screen application on a touch pad. The two supports of lexical heuristic maps allow the acquisition of semantic relations as well (Lavoie, Pellerin, 2017). One of the advantages of making the lexical heuristic map using the touch pad is to have access to the student's metalinguistic reasoning through video recording. To complete the heuristic lexical map, the student uses the lexical decision tree as a memory reminder of lexical strategies learned. (Http://crl.recherche.usherbrooke.ca/index.php/etape-4/)

Step five: Collaborative Dialogue on Semantic Relations
In teams of two or three, students confront their perceptions with the support of the lexical decision tree (Figure 1). Self-help and co-construction of lexical knowledge are at the heart of this stage of the lexical research community. This moment is used by students to verbalize lexical strategies to explain the semantic relations to their teammates and to answer the questions of their peers. The dialogue allows students to compare, negotiate and co-construct their knowledge of the meaning of words.
During reflective practice, the teacher leads students to verbalize what they have learned; the difficulties they experienced; the strategies they used, etc. This step can end with an exchange with the whole class when certain ambiguities persist. (Http://crl.recherche.usherbrooke.ca/index.php/etape-5/)

3. **Methodology**

3.1 The preferred research methodology for this project is based on a qualitative research paradigm rooted in epistemological perspectives that are both participatory and critical. The concept of participation adopted as part of this research invokes the involvement of the players concerned, namely the teachers and the students. Each step of the process and each of the tools were developed by the research team and then experimented and commented on by the actors. The whole process of experimentation was documented by digital ethnographic observation (Pellerin, 2012) using digital tablets. Finally, the whole process and its tools have been improved with regard to the recommendations of the actors.

3.2 Context and actors in research
The research project took place at a primary school in the metropolitan area of the city of Montreal, in the province of Quebec, Canada. Although the school is located in a predominantly French-speaking context, a strong multi-ethnic and multilingual concentration is found among the student population. The deprivation index (socio-economic background index and family income index) is at the most disadvantaged level, 10 on a scale of 10. It is known that children from economically disadvantaged backgrounds have a more limited vocabulary than children from socio-economically advantaged backgrounds (Hart and Risley, 2003). Two primary (grade 4) classes were selected on the basis of a convenience sample (n = 38 students), under the responsibility of two female teachers who responded to our invitation. All 38 students participated in the various activities planned as part of the implementation of the LRC steps as learning activities as part of the routine of the class.

3.3 The data collection

Each of the students participating in the study was part of a focus group of 4 or 5 people midway through the experiment. At the end of the experiment, all students participated in a semi-structured individual interview with one of the researchers and a face-to-face interview conducted using the ShowMe voice and video capture application. The individual interview conducted using the video screen capture application consisted of each student answering questions or completing sentences by recording their responses on the application (eg, What did they say? Which helps you most to learn: the paper word card; the digital map with ShowMe and the picture; or ShowMe with drawing? When I speak aloud with ShowMe, my brain ...). All of these data collection methods were designed to understand the benefits and limitations of each of the steps and tools in the didactic approach. According to author Pellerin (2017), "The potential offered by new digital and mobile technologies is also contributing to the emergence of new modes of observation that go beyond traditional audio-video recording" (p.7).

In addition, two semi-structured interviews were conducted with each teacher after class interventions. Each of the 38 students was invited to participate in a semi-directed individual interview at the end of the project and a mid-term project group discussion to discuss his learning experience.

The data analysis was conducted by emerging categorization (Paillé and Mucchielli, 2003) according to each step of the LRC. In a first phase of analysis, the codes used were "advantages" and "limits" per stage of the process. Then, the data was grouped according to the "benefits" named in the same step. The use of the Nvivo software was used for coding and contrecoding by two research assistants and the principal investigator.

4. Presentation and analysis of results

The following section presents the results that have emerged from the analysis of the semi-structured interviews with students (n = 38) and teachers (n = 2) at the end of the project. These results are organized according to two main codes: the advantages and the limits of the different stages of the dialogic and multimodal approach of the LRC.

4.1 The philosophical discussion for the sharing of ideas and lexical accessibility.

The majority of students, 32 out of 38, recognize the benefits of large group discussion for sharing ideas. From the interviews it appears that the multi-interaction stimulates and raises the level of reflection of all participants and the sharing of ideas:

(S4): with the group there are more brains, and there are more people who are intelligent.

(M16): if we listen we can improve, then as our ideas and make more complex mixtures ... more complete like that.

Of the 27 students who report the benefits of group listening, 21 of them add that speaking together in the group contributes not only to the development of ideas, but also - and perhaps most importantly - to find the right word. Social interaction would facilitate lexical accessibility:
(M5): my brain it gets used to people because if I speak alone I do not find the right words, worse if I speak with the whole group it's like that makes my task easier because if a person says one idea and the other person says another idea that goes with the idea that the person said so that it helps me and I talk a lot more than before.

4.2 Active listening of words with the observer card for lexical acquisition

Twenty-seven students out of 38 indicated that listening to others contributed more to lexical acquisition:
(S13): They use different words from me, so I will learn new [words].

A teacher compares the group listening activity to the individual written production. Sometimes the student does not respond verbally to the topic or question, but the mere act of listening actively to others acts as a catalyst for ideas:

(E1): Those who do not speak much are still active in an oral process because they hear what is happening. They can - without saying so - ask questions about what others have said in the discussion circle, unlike a student who does not write much and who is all alone, well, there is nobody who will feed him to write so he will remain frozen; he will be much less active than the pupil who does not speak but who participates by listening.

4.3 Active listening of words with the observer card to keep written records and discern sense links

As observers, the students on the periphery of the discussion circle noted on their observer cards the words heard that were meaningfully related to the word of the day. The observer card is considered easy for the students to complete because the students note the words from the discussion without analyzing them. For 8 students out of 38 and a teacher, this card appears as an essential complement to the group discussion, because it allows them to keep words that can be reused during the realization of their lexical heuristic card.

(S19): You can remember, you can write the things you need to know, and after that when you get to the final map you can do a lot of things.

One teacher and one student noticed that the observer's position facilitated the ability to discern the essentials of the accessory. As their understanding of meaningful connections progressed, students were able to use their lexical knowledge to score fewer words that were farther away from the target word.
4.4 The limits of philosophical discussion: Lexical accessibility

Difficulties related to the group discussion were mentioned by 5 of the 38 students. The challenges oscillate between the difficulty of finding the right words to express one's thoughts and the participation in the philosophical discussion while having to establish links of meaning simultaneously:

(M5): sometimes I question a lot and I cannot find words. That's why sometimes I say nothing during the discussion but sometimes I say one or two things.
The advantages of the paper heuristic lexical card: memory reminders and ease of use

Fourteen out of 38 students indicated a preference for the paper lexical heuristic card. The main arguments mentioned indicate that the images, the colors, the pictograms and especially the examples

act like memory reminders of the knowledge learned on the different links of meaning (n = 11). In addition, three students mention that this card is easier to use:

(M12): everything is already there and the ideas are a little clearer.

(M8): I have less things to do, I just classify and it's easier.

The limits of the realization of the paper map: no trace of the metacognitive reasoning

Although the visual supports of the paper map sometimes facilitate the task of classifying certain words, this card does not allow the students to hear and listen to each other, as is the case when using the paper.:

- (S3): when it gives words like impressive, interesting, it's more difficult to place them because I do not really know: I know if it's a synonym, thematic word, antonym or family?
- Researcher: And it's easier when you talk to your tablet?
- (S3): Yes.
- Researcher: Why?
- (S3): Because when I'm on the map, hmmm how to say, when you speak in your head it's harder to remember, then when you speak out loud it's easier, then the more you listen ...
One of the important limitations of the paper map reported by a teacher is the absence of traces of the cognitive processes deployed during the task and the lack of opportunity for the student to revisit his thought in order to engage in a process of metacognitive reflection his learning:

(E1): If it erased, it was erased forever. We could see traces below the times for those who erased less well, but we do not know why he placed a word especially in the synonymous meaning link when he should have been in the same family, well we did not know why.

The advantages of the digital card: to speak aloud to reflect, to draw to remember, to listen to one's lexical reasoning, to support lexical reasoning thanks to multimodality

The two most popular modalities for students were the aloud explanation and sensory interaction (drawing and finger writing) with the touch screen. A significant number of students (n = 20) out of 38 indicated that speaking out loud helped them find meaningful connections because it allowed them to focus better and think more effectively:

(S10): When I speak aloud on ShowMe, I concentrate more; my brain saves information.

(S13): My brain is thinking of other words when I speak with ShowMe; my brain has other ideas that I could add.

The voice-activated video capture application allowed students to photograph the heuristic lexical map (see Figure 2) or to reproduce it by drawing. Eighteen students indicated that sensory interaction through digital drawing when drawing the heuristic lexical map promotes the establishment of meaningful connections. According to them, they can activate the remembrance through the shape as well as the color, which allows to express meaning beyond the words:

(M18): Because drawing is like talking, a little, but without the words. Then talking without words is like expressing what you really mean without saying it.

The ability to revisit digital production at any time is also seen as an advantage for students. A significant number of students (n = 20) mention the benefits of metacognitive thinking to self-correct:

(M9): It's like I'm two, it's as if the tablet was another me.

(M12): It's like I'm entering a world where I show people how to do things and to myself, and that's a lot better than talking to yourself. But when I talk to ShowMe, too, I talk to myself, but it's like ShowMe is transporting me to a world where it's like talking to everyone and that's the fun with ShowMe.

In addition to listening again, remember that the modalities offered with ShowMe are finger or keyboard writing, speaking, photography and drawing. For 9 of the 38 students, multimodality facilitates lexical reasoning:

- Researcher: You spoke, you touched, you wrote, you drew, you listened. Did all these tools help your brain or mix you up?
- (S5): It helps me more, when I speak, I say what I think of words. When I touch, I try to place the words. When I listen, I tell myself if I made mistakes or not.
Researcher: That did not happen in your brain with the paper map?
- (S5) No, because we did not really talk and we did not touch.

5. Discussion

It should be noted that all the steps of the LRC have been analyzed in a linear manner, in terms of advantages and limits. However, the LRC is an ecosystem in which each of the stages interrelates. Indeed, we cannot privilege one step to the detriment of another or interchange the order without altering the results of the whole. The LRC is an approach where each step involves dialogic discourse and the use of multimodality.

Although all of these steps form a single didactical approach to teaching semantic relationships, students point out that there are benefits and limitations to certain stages. In light of the analysis of the results, students indicate that the stages of the philosophical discussion, the realization of the digital heuristic lexical map and the collaborative dialogue would have greatly contributed to their understanding of the semantic relations. These findings are in line with the discursive approaches to teaching the meaning of words (Plane and Lafourcade 2004, Nonnon 2008). In later work, Mondada and Pekarek Doehler (2004) argued that the meaning of words is built in interaction with others. This echoes the students' comments when they mention that philosophical discussion allows for more ideas. Through the interaction emerges a curiosity for words as well as a collaborative spirit to search,

find and deepen the meaning of words. As part of this study in a multilingual context, teachers were also able to observe the importance of starting lexical work with dialogue in order to create more context for the sharing of ideas and the networking of meaningful relationships. According to these, students feel less judged orally than in writing. More recent writings by Van Compernolle (2015) have reiterated the importance of starting semantic work from the representations and experiences of learners through dialogue. In the approach of the LRC, we find that the dialogical discourse during the stage of the philosophical discussion makes it possible to emerge the representations on the target word (Mondada and Pekarek Doehler, 2004, Van Compernolle, 2015) while reflecting the plurality the lexical and experiential baggage of children. It is this corpus of words produced by children that, in a second step, guides the stage of modeling lexical strategies.

Access to multimodality through the different stages of the CRL was also raised by both students and teachers as an important benefit of the didactic approach. The results from the functional and cognitive level data analysis of the digital map illustrate that the multi-modal and multisensory nature of the digital map has allowed students to discover or deepen meaningful connections based on their preferred modalities. Indeed, the use of the ShowMe application on the touch pad allows the recording of the user's voice as well as its sensory interaction with the touch screen (write with the finger or the keyboard, draw , move the images). Placed in free choice, all students without exception used at least two modes (eg voice and tactile interaction with the screen) to perform the tasks requested. These results echo research findings in the field of neuroscience (Cisco, 2008) and those in second language context with mobile technologies (Pellerin, 2014; 2017).

Another advantage of the digital map that emerges from the analysis of the results is that of the externalization of the internal dialogue which allows the awareness of the learning processes in the pupils. Thus, verbalization aloud allows the reflection and extension of ideas to establish semantic relationships.
According to cognitive science research, awareness is crucial in the development of metacognitive reflective skills (Brantford et al., 2000). In addition, second-language research (Lantolf and Thorne, 2006), informed by the internalized language theory put forward by Vygotsky (1985), identifies the relationship between language and thought and the importance of internal dialogue in the cognitive development of the student, since it promotes awareness and autonomy over the execution of tasks. According to Lantolf (2000), verbalized thought opens the possibility of thinking learners' discursive choices as traces of cognitive processes (Pellerin, 2017) and as relevant means for learning. The results of the data analysis demonstrate that, using the digital map, students engage in this dialogue with themselves aloud when they work alone on a complex task or when their teacher is unavailable to provide them with individual support.

The phenomenon of audience effect has also emerged from data analysis. The recording of the pupils' voices during the realization of the lexical heuristic card by means of the voice application and screen capture on the touch pad is, as it were, tinged with an effect of audience which abolishes the border between transmitter and receiver, making listening a highly active activity. Indeed, thanks to the digital heuristic lexical map, the student spontaneously positions himself as a presenter who explains to a fictional audience. Explanation to others can therefore be achieved without the physical presence of others. Nevertheless, the student remains conscious or aware that he produces his lexicon for himself, for a partner or for his teacher. Research has shown that this process, which includes voice

recording and multimodal interaction with the tablet, followed by replaying, and then adding, altering, or retrieving the digital document helps to support student's self-assessment and self-regulation (Pellerin, 2017b).

Conclusion

The Lexical Research Community (LRC) is an innovative approach that responds to a need for renewed literacy practices for a new era. In particular, it fills a gap in lexicon teaching, both by its dialogical and multimodal nature. The adoption of the term "community" emphasizes the importance of creating a synergy between students and the teacher, as well as between students around a common interest in the appropriation and understanding of the links of meaning between words. Within this community of learners, the interest in lexical learning is manifested by a climate favorable to exchanges and active listening. The term "research community" refers to the enhancement of curiosity about words, the discovery of new words, and the process of investigating meaningful links by or for students. Lexical research takes place at all stages of the didactic approach by encouraging attempts to explore various formulations in order to seek to clarify its lexicon, by showing openness to the semantic representations of other students, by inviting pupils to help each other in finding words and verifying their hypotheses on the links of meaning between words.

In light of the results of this study, LRC is an inclusive teaching approach that allows students to demonstrate their knowledge and understanding of semantic linkages through multiple modalities that generate interest and commitment to lexicon learning.

The results of this study reiterate the importance of adopting pedagogical approaches that promote the co-construction of knowledge through dialogue and access to multiple modalities offered by digital technology tools. However, this first phase of the study is limited to the perceptions of students and teachers about the benefits and limitations of each step of this approach. In the second phase of this study, a quantitative data collection was conducted to measure the effect of this approach on the acquisition of semantic relations (Lavoie and Pellerin, 2018 submitted). The results will also help to better understand the impact of the LRC as a multimodal and multisensory approach to the acquisition of semantic relations.

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