Language Tasks Using Touch Screen and Mobile Technologies: Reconceptualizing Task-Based CALL for Young Language Learners

Activités langagières et technologies mobiles : un changement de paradigme dans la conception des tâches en apprentissage des langues assisté par ordinateur pour jeunes apprenants

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Abstract

This article examines how the use of mobile technologies (iPods and tablets) in language classrooms contributes to reconceptualization of task-based approaches for young language learners. The article is based on a collaborative action research (CAR) project in Early French Immersion classrooms in the province of Alberta, Canada. The data collection included digital ethnographic observation in the classrooms, students' artifacts, and interviews with teachers and students. The findings outline how the use of mobile technologies such as iPods and tablets contributes to reconceptualization of language tasks by allowing young learners to create their own learning environment and meaningful language tasks, as well as self-regulate their language learning process. The research also provides evidence of how the use of mobile technologies helps reconceptualize task-based approaches for young language learners that reflect learning principles from the interdisciplinary research fields of neurosciences and cognitive sciences, as well as Vygotskian sociocultural theories in second language acquisition (SLA).

Keywords: iPad; iPod; second language; young learners; touch screen technologies; mobiles devices; collaborative action research.

Résumé

Cet article étudie la façon dont l'utilisation des technologies mobiles (iPods et tablettes) dans les classes de langue contribue à la refonte des approches basées sur des tâches pour les jeunes apprenants. L'article se fonde sur un projet de collaboration recherche-action (CRA) dans les classes initiales d'immersion en français dans la province de l'Alberta, au Canada. La collecte de données comprenait l'observation ethnographique numérique dans les salles de classe, les artefacts des élèves, et des entrevues avec les enseignants et les étudiants. Les résultats ont montré comment l'utilisation des technologies mobiles telles que les iPods et tablettes contribue à

la refonte des tâches et des activités langagières en aidant les jeunes apprenants à créer leur propre environnement d'apprentissage et des tâches langagières pertinentes, à s'autoévaluer et à réguler leur processus d'apprentissage linguistique. La recherche met aussi en évidence la façon dont l'utilisation des technologies mobiles contribue au remodelage d'approches basées sur les tâches qui reflètent les principes d'apprentissage fondés sur de nouvelles théories d'apprentissage ainsi que sur les théories socioculturelles de Vygotsky sur l'acquisition d'une seconde langue.

Introduction

Research in the field of computer-assisted language learning (CALL) in the last two decades has provided ample evidence of the value and potential of technologies in enhancing language teaching and learning (e.g., Chapelle, 1997; Levy & Stockwell, 2006; Warschauer & Healey, 1998; Warschauer & Meskill, 2000). The emergence of new interactive and collaborative Web 2.0 online tools has also helped language teachers to contemplate new pedagogical approaches (e.g., Wang & Vasquez, 2012; Warschauer, 2004) and new strategies for CALL task-based language learning (e.g., Chapelle, 2001; Guichon, 2012; Hampel, 2006, 2010; Lamy & Hampel, 2007; Luzón & Ruiz-Madrid, 2008; Siekmann, 2008).

In the last few years, new mobile technologies have also emerged, becoming ubiquitous tools in today's society. Although the term *mobile technologies* is not new to the field of CALL (Burston, 2013), it does go beyond portable computers such as mobile personal laptops, and earlier versions of smartphones and MP3 players (Godwin-Jones, 2011). The definition of mobile technologies adopted in the context of the present research is first aligned with Godwin-Jones's (2011) description of emergent and mobile technological devices—such as iPod, new smartphones, and tablets (e.g. iPads) —that have enhanced hardware and OS capacities. These mobile devices offer advanced built-in functionalities such as video cameras and voice recognition, as well as access to online software programs known as *apps* (short for "application"). These apps also provide new voice recognition features and audio and video tools such as ShowMe and Puppet Pals, which create new learning environments that were not available previously on personal computers such as laptops. Moreover, the "touch screen" feature of the iPods and tablets (e.g., iPads), which corresponds to an electronic visual display, allows the user to directly interact with the interface rather than using a mouse or any other intermediate device. This tactile interface makes the touch screen one of the most distinct and powerful features of mobile devices such as iPods, tablets, and smartphones.

The use of these touch screen and mobile devices and their access to online apps is making its way into educational contexts, and educators are starting to contemplate the potential of these devices for educational purposes. The field of CALL research has also started to explore the potential of the use of mobile technologies for mobile assisted language learning (MALL; see review of MALL implementation studies, 1994–2012, in Burston, 2013) to support second language learning and teaching.

However, literature and research on MALL have been mainly concerned with mobile devices such as smartphones (e.g., Burston, 2013; Chu, 2011; Stockwell, 2010, 2013) and with adult learners (university and college students) who demonstrate intermediate or advanced levels of

language competencies in the second language. Although there has been some recent research on the use of emergent mobile touch screen devices such as iPads in the context of language learning (e.g., Lys, 2013), such research still focuses only on adult or adolescent learners in English as a second language contexts. In addition, these studies have been more concerned with vocabulary learning activities (e.g., Stockwell, 2010) and grammar exercises (e.g., Li & Hegelheimer, 2013). Research in CALL concerning the use of touch screen and mobile technologies such as iPods and tablets is still for most part in the early stages, especially with regard to young language learners (Pellerin, 2012a, 2012b). Moreover, the issue of task-based language learning linked with the use of these new touch screen and mobile technologies in the primary language classroom (children ages 5–12) is very much unexplored.

This article aims to contribute to this limited body of knowledge by examining how the use of mobile technologies such as iPods and tablets contributes to the reconceptualization of approaches to language tasks for young learners in classroom contexts. In particular, it examines how the use of these new touch screen technological devices supports the designing of learning environments and language tasks, informed by emergent theories of learning provided by interdisciplinary fields such as neurosciences and cognitive sciences as well as principles of language learning grounded in Vygotskian sociocultural theory for second language acquisition (SLA). The article also examines the pedagogical shift from instructional approaches to task-based learner-centered approaches that support the shared creation of learning environments and language tasks by teachers and learners, to promote active and meaningful language learning for young learners.

Theoretical Framework

In order to provide a global understanding of how learning takes place, as well as the learning environment required to optimize the learning process, the use of mobile technologies such as iPods and tablets in the context of language learning for young learners will be examined first through the lens of learning theories from interdisciplinary research fields. The theoretical framework will also be informed by sociocultural theories in SLA, based on Vygotsky's theory of the mind, to provide further understanding of the need for a shift in CALL task-based approaches toward the types of tasks that allow young language learners not only to create their own learning environment, interactions, and learning trajectories, but also to self-assess and regulate their language learning development.

Learning Principles Based on Theories of Learning

Anderson (2004), in his work about the development of theory and practice of online learning, discussed the importance of theories in helping us to see the "big picture." According to Anderson,

> This broader perspective helps us to make connections with the work of others, facilitates coherent frameworks and deeper understanding of our actions, and perhaps most importantly allows us to transfer the experience gained in one context to new experiences and contexts. (Introduction section, para. 1)

Influential scholarly work (e.g., Bransford, Brown, & Cocking, 2000), has provided collective knowledge from various interdisciplinary fields—including cognitive science, neuroscience, and

educational psychology—that contribute to better understanding and knowledge about how the brain functions and how people learn. Such high-level theoretical and empirical frameworks provide the lenses that Anderson considered necessary for understanding developments in the research about learning, and for understanding how such research has contributed to producing the following guiding principles that can be applied to designing learning in various learning environments.

Students' prior knowledge

- Students come to school with a range of prior knowledge, skills, beliefs, and concepts that significantly influence the building of new knowledge.

- "There is a good deal of evidence that learning is enhanced when teachers pay attention to the knowledge and beliefs that learners bring to a learning task, use this knowledge as a starting point for new instruction, and monitor students' changing conceptions as instruction proceeds." (Bransford et al., 2000, p. 11)

Active learning and meaningful learning

- Learning tasks need to be perceived as relevant to students and connected to the world and their own reality. Such tasks need to be based on real-world problems, and organized around subjects that will foster intellectual, cognitive, and emotional engagement with students. (Bransford et al., 2000; Cisco, 2008, Friesen, 2009)

- "Students learn more when the concepts are personally meaningful to them. . . . This translates into a need for authentic learning in the classroom . . . students learn topics in ways that are relevant and meaningful to them." (Cisco, 2008, p. 11)

- As our knowledge about the complexity of the nature of learning and the various physiological, cognitive, and emotional factors that influence the process increases, effective designs for learning need to include a variety of modalities to promote multimodal learning (CAST, 2011; Pellerin, 2013), which "has been shown to be more effective than traditional, unimodal learning." (Cisco, 2008, p. 14)

Metacognition

- Students need opportunities to develop awareness about their learning process and learning content. To improve the outcomes of their learning and to become aware of their strengths and weaknesses, they need to engage in metacognitive processes that involve self-monitoring and self-regulation of their learning. (Bransford et al., 2000; Hartman, 2001)

- "A 'metacognitive' approach to instruction can help students learn to take control of their own learning by defining learning goals and monitoring their progress in achieving them." (Bransford et al., 2000, p. 29).

- "Learning is optimized when students develop 'metacognitive' strategies. To be metacognitive is to be constantly 'thinking about one's own thinking,' in search of optimizing and deepening learning." (Cisco, 2008, p. 12)

- Metacognition is directly related to learner autonomy by making the learners agents of their own thinking and learning (Benson, 2007; Bransford et al., 2000; Holec, 1981; Nunan, 1995).

Although emergent learning theories differ in some aspects, they share an emphasis on considering children as active agents of their learning, who are able to set goals, carry them out, and assess and regulate their learning. Based on new understanding gained from interdisciplinary learning research, learners are no longer seen as mere passive recipients of transmitted knowledge, but as creators of their own learning environments, learning activities, and ways to assess to their own learning outcomes.

Research in the field of teaching a foreign language to young learners has also expanded in the last decade, especially with regard to teaching English (e.g., Cameron, 2005). Knowledge about how young language learners learn a second or additional language allows teachers to make informed choices about pedagogical approaches and instructional strategies to optimize the language learning of all young learners (Cummins, 2008; Rueda, 2008).

CALL Tasks That Promote Creative Language Learning in CALL

In the last three decades, task-based design approaches (Ellis, 2003, 2005; Nunan, 2004; Willis, 2009) in the field of second language teaching have emphasized authentic use of the target language through meaningful tasks that allow linguistic skill building. These approaches promote the creative and spontaneous use of language through tasks and problem solving, as well as providing an opportunity to link the use of the target language to real-world activities. They also involve the concept of scaffolding, which was informed by Vygotsky's theoretical construct of the zone of proximal development (ZPD) and adapted by van Lier (1996) in the context of language learning. In task-based design approaches the concept of scaffolding is incorporated through a "teaching strategy consisting of episodes, sequences of actions, and interactions which are partly planned and partly improvised" (van Lier, 1996, p. 100).

Studies in the field of computer-assisted language learning (CALL) have also explored the pertinence of the concept of language task within the unique technology-mediated context that CALL provides. Scholars working in the field of CALL have investigated the nature of the language tasks that would take place in language interaction mediated by technology. Chapelle (2001) was the first to propose a set of detailed criteria to determine the appropriateness of a given CALL task for supporting language acquisition.

The emergence of mobile technologies as tools to support language tasks is also attracting the attention of researchers in the field of CALL. Stockwell (2007) suggested that smartphones "have the potential to become a more integral part of language learning courses as opposed to the more supplemental role often assigned to computer labs." However, the language tasks designed in this new CALL context still reflect, for most part, highly organized language tasks that gear the learning toward predetermined task outcomes.

Emerging technologies are contributing to the development of many new opportunities to guide and enhance learning that were unimagined even a few years ago (Bransford et al., 2000, p. 4). Research indicates that these technologies are helping to create new learning opportunities as

well as new learning environments in the context of second language learning (e.g., Godwin-Jones, 2011; Jeon-Ellis, Debski, & Wigglesworth, 2005; Stockwell, 2010).

The use of mobile devices such as iPods and tablets (e.g., Apple iPads) and access to mobile apps (Godwin-Jones, 2011) also holds potential for contributing to the design and implementation of creative and interactive language tasks (Lys, 2013; Pellerin, 2012a, 2012b) that can be designed and assessed by the language learner.

This view of task-based learning supported by the use of mobile technologies reflects a growing body of research in second language acquisition, grounded in part in Vygotskian sociocultural theory, which supports a more dynamic view of the concept of task (e.g., Ellis, 2003). "In this view, tasks are understood to be fluid constructs that become transformed by the individuals who enact them in their classroom activity" (Kahn, 2012, p. 91). This perspective on shared power and distribution of communication in the language classroom is also linked to a more emancipatory interpretation of the ZPD concept, which is found in the work of Newman and Holzman, Lantolf, and Dunn and Lantolf (as cited in Lantolf & Thorne, 2006). Moreover, Dunn and Lantolf have suggested that

> from the sociocultural perspective, second language learners have a second chance to create new tools and new ways of meaning . . . and gain self-regulation through linguistic means. In an important sense, L2 learning is about gaining the freedom to create. (cited in Lantolf & Thorne, 2006, p. 275)

There is also a growing body of classroom-based studies grounded in Vygotskian sociocultural theories; these studies have "focused on the tools learners use to control their own second language development" (Kahn, 2012, p. 91). The kinds of tasks based on theoretical frameworks associated with Vygotsky's sociocultural theories can provide opportunities for learners to help shape their own language learning environment and trajectories, and their own learning outcomes.

Concept of Affordance

Research on the use of mobile technologies, particularly smartphones, in CALL contexts has addressed the affordance of these new technological devices in terms of their physical characteristics (Godwin-Jones, 2011; Stockwell, 2013). In the literature on the use of mobile technology in education in general, the affordance of mobile technologies has also been discussed in terms of the *accessibility*, *immediacy*, *personalization*, and *intelligence* that they offer to learners (see Pouezevara, 2012).

However, this paper will adopt a more ecological perspective on the concept of affordance, as suggested by Hartson's (2003) four types of affordances:

- *cognitive affordance* (design feature that helps users in knowing something);

- *physical affordance* (design feature that helps users in doing a physical action in the interface);

- *sensory affordance* (design feature that helps users sense something, especially cognitive affordances and physical affordances);

- *functional affordance* (design feature that helps users accomplish work). (summarized in Hartson, 2003, p. 323, Table 2)

This perspective on types of affordance is appropriate to the present inquiry into the use of touch screen and mobile technologies for young language learners, as it reflects the role that these technologies play "in supporting users during interaction, reflecting user processes and the kinds of actions users make in the task performance" (Hartson, 2003, p. 316).

The concept of affordance adopted here is also aligned with the universal principles found in the UDL curricular framework (CAST, 2011). "The UDL framework provides guidance for the development of curricula to furnish options and remove barriers to learning among students with learning difficulties and disabilities, and among students with diverse learning needs and preferences" (Pellerin, 2013, pp. 49–50). The UDL curricular framework is guided by three main principles that have been informed by research in neuroscience: multiple means of representation, multiple means of action and expression, and multiple means of engagement (see CAST, 2011, for further discussion). The significance of its link with the use of touch screen and mobile technologies and reconceptualizing the task-based approach for young language learners is that UDL promotes the adoption of instructional strategies and technological tools aimed toward supporting, scaffolding, and enhancing learning for all students.

Thus, the use of touch screen and mobile technologies such as iPod and tablets (e.g. iPads) in the context of language learning for young language learners needs to be examined so we can see how these technologies help make it possible for language learners to create and design learning tasks that allow for greater control over their own language learning. Moreover, we need to explore how the use of these technologies may contribute to the concept of metacognition, which is directly related to learner autonomy in that it makes the learners more aware of and responsible for their own learning (Benson, 2007; Holec, 1981; Nunan, 1995).

Method

The study was informed by a qualitative, interpretative research methodology (Denzin & Lincoln, 2008), and made use of the collaborative action research (CAR) model (Pellerin, 2011). Since CAR has been shown to be transformative by engaging teachers in systemic inquiry (spiral of action and reflection; Carr & Kemmis, 1986; Riel, 2010) with the goal of improving their teaching practices (Anadón, 2001; Denos, Toohey, Neilson, & Waterstone, 2009), it was understood to be the most suitable methodological approach for the nature of the inquiry.

The inquiry was also informed by a grounded theory as qualitative research approach (Glaser & Strauss, 1967). It was first guided by a generative question based on the theoretical framework, but with the intent to let more specific questions emerge during the inquiry:

- How does the use of these technological devices support the designing of learning environments and language tasks, based on interdisciplinary informed theories of learning as well as principles of language learning grounded in Vygotskian sociocultural theory for SLA?

Moreover, in accordance with the postmodern concept of inquiry, and unlike most CALL questions investigated using a positivist paradigm, this generative question should by no means be understood as being static. The present inquiry does not aim at providing answers to this

specific question, but rather builds from it in order to gain greater understanding of the phenomenon being explored.

Participants

The study involved 16 teachers from two elementary schools that hosted Early French Immersion programs in a school district in a rural suburb of Calgary, Alberta. The distribution of the French Immersion teachers was as follows: four Grade 1 teachers, three Grade 2 teacheCrs, one multilevel teacher (Grades 1 and 2), three Grade 3 teachers, two Grade 4 teachers, and three resource teachers. All teachers voluntary participated in the CAR project.

Data Collection and Analysis

Following the CAR methodology, the data collection was achieved on an ongoing basis by the teachers in their respective classrooms. Teachers gathered digital documentation (examples of students' use of iPods and tablets, such as audio and video recordings; digital projects achieved with educational applications such as Puppet Pals, ShowMe, Educreations); this documentation was also part of another study (not presented here) in which the teachers engaged in a process of reflection and inquiry about their students' learning. The researcher (the author) was also engaged in data collection through digital ethnographic observation in the classroom, the gathering of students' artifacts (examples of students' use of iPods and tablets), discussion and semistructured interviews with teachers, and informal interviews with students during the classroom observations. Following a reflexive approach (Pink, 2007) that involves the active participation of the participants in the process of data analysis and interpretation, the teachers and the researcher met on regular basis as a group to engage in discussion, analysis, and interpretation of the various sources of data (Pellerin, 2011).

Since the study involved human subjects, it was necessary to obtain ethical clearance from the university's Research Ethics Board (REB). Thus, before any gathering of data by the teachers and the researcher, an information letter that briefly described the aim of the project and the proposed methods was distributed to the parents of all students enrolled in each classroom involved in the project. Students in all classrooms were also informed of the project and were considered active participants and co-researchers along with the teachers and the author.

The triangulation of the data (digital documentation from multiple sources; Denzin & Lincoln, 2008) and continual data analysis were achieved by means of "thick description" or layers of interpretation (Geertz, 1973). A coding process aligned with qualitative research approaches (Miles & Huberman, 1994) was used to analyze the raw data obtained from the various sources. In turn, the coding process allowed the identification of initial and emerging categories. The initial coding categories were guided by the conceptual framework of this study. A second set of categories also emerged from the data itself, consistent with the grounded theory method of qualitative data analysis (Glaser & Strauss, 1967; Strauss & Corbin, 1994).

Findings and Discussion

The qualitative analysis of data gathered from different sources throughout the CAR research project has allowed the emergence of several key themes. These themes further our understanding about how the use of touch screen and mobile technologies such as iPods and tablets contributes to the reconceptualization of language learning tasks and activities for young

learners. Such a reconceptualization reflects learning principles from the interdisciplinary fields of neuroscience and cognitive science research, as well as Vygotskian sociocultural theories in second language acquisition. These key themes also demonstrate how the use of touch screen mobile devices is aligned with the concept of affordance suggested by Hartson (2003). In particular, the outcomes of the inquiry into the use of technological devices by young language learners reflect the four types of affordances proposed by Hartson: *cognitive affordance*, *physical affordance*, *sensory affordance*, and *functional affordance* (p. 323). These outcomes provide us with tangible evidence of how these four types of affordance provided by the use of touch screen and mobile technologies

- allow the creation and designing of new learning environments by the young learners and promote active engagement in authentic and meaningful language learning tasks;

- further promote social interaction among learners, and dialogue that fosters peer scaffolding and metacognitive reflection on the learning processes as well as the product; and

- allow choices in the ways learners may engage in the learning tasks, as well as how they may choose to demonstrate their new knowledge and understanding in the context of language learning.

This section will discuss four core key themes that have emerged from the data analysis: (1) creating authentic and meaningful language learning, (2) autonomy of the learner in creating learning environments and language learning tasks, (3) metacognition and conscious awareness of the language learning process, and (4) emergence of self-reflective assessment and regulation of the language learning process.

Creating Authentic and Meaningful Language Tasks

The findings provide evidence that the use of touch screen devices such as iPods and tablets by young language learners contributes to these learners' creation of authentic and meaningful task activities that further promote the development of their oral language competencies. For example, students in a Grade 1 classroom (6–7 years old) were engaged in independent and self-directed learning activities in "learning centres," using iPods to make video recordings of their own puppet shows. Students first chose a puppet from those made available in the classroom, and then started to create their own dialogue and interactions using the puppets as the main characters. To construct authentic and meaningful dialogue with their puppets, students needed to use existing language resources built up from previous experience with language (Cameron, 2005) used in the classroom. In the context of the Early French Immersion program, the vocabulary had already been introduced through curriculum subjects such as Mathematics (numbers and shapes); Science (animals, foods, colors, etc.); and thematic units in Language Arts (including reading and writing) such as fairy tales, snowmen, teddy bears, and spring is in the air. Thus, instead of rehearsing a predetermined chunk of talk, students were creating their own oral tasks, using words and phrases to create their own dialogue with the puppets. Working in pairs or small groups, students would take turns using the iPods to video record their puppet show. As a result, they were also creating their own listening activities by constantly replaying and listening to the video recording. Similar activities were also created through educational apps

such as Puppet Pals, in which the students were able to create their own dialogue between characters selected from the program (e.g., a dragon and a princess; see Figure 1), or by taking pictures of their friends with the tablets to included them as characters in their storyline.
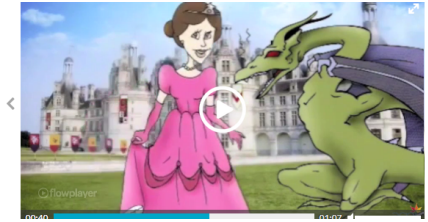

Figure 1. The learner (Grade 1) used the Puppet Pals app to create her own dragon and princess story (https://capsulesorales.csj.ualberta.ca/index.php/les-capsules-video/loral-et-les-technologies-numeriques/raconter-une-histoire-avec-puppetpal-apps).

Other examples of language tasks created by the young learners with the use of iPods and tablets included storytelling based on pictures selected by students or based on their own imagination, retelling stories based on books read, dramatic plays, TV talk and interview programs, creation of music videos, show and tell about personal experiences, providing directions for finding a treasure on a map (also created by students; Figure 2), and giving specific instructions on "how to blow a bubble with gum" or "how to eat an Oreo cookie." Through listening to and viewing their own audio/video recordings of their use of the second language, students were able to reflect on their work, and to judge what was good about it and what needed to be improved. The young learners demonstrated a high level of cognitive engagement in the oral practice, and greater motivation toward using the target language with the use of the mobile devices, by making several recordings of the same activities with the intent to improve each time.

Figure 2. The learner (Grade 2) used the video recording feature available on an iPod to provide directions for finding a treasure on a map (https://capsulesorales.csj.ualberta.ca/index.php/les-capsules-video/loral-et-les-technologies-numeriques/lutilisation-de-ipod-au-service-de-la-production-et-levaluation-de-loral).

When asked, a Grade 3 learner said that he preferred using iPods/tablets when speaking in the target language. He explained that the technical devices allow the learner not only to produce language but also to revisit it by listening to the audio and/or video recording. Moreover, the tangible traces of the learning provided by the technological tools allow the learner to engage in a reflection on the outcomes of the tasks (self-reflection and regulation will be discussed further in the fourth theme).

> Researcher: Qu'as-tu fait avec le baladeur (iPod)?
>
> Student: J'ai parlé à propos d'une histoire qui s'appelle Loup et puis j'ai dit ce qui était arrivé et fait et puis j'ai entendu moi dire ce qui est arrivé.

Researcher: Donc tu as parlé et puis tu as écouté ce que tu as dit?

Student: Oui.

Researchers: Est-ce-que tu préfères parler avec le baladeur ou sans le baladeur ? Et pourquoi?

Student: Avec le baladeur parce que tu peux entendre après quels mots anglais tu as dit . . . après quand je fais, comme le autre fois que je fais je peux dire ces mots et pas les mots en anglais.

These findings support the differentiation of types of affordance suggested by Hartson (2003). The use of touch screen and mobile technologies such as iPods and tablets promote engaged learning, based on the engagement theory proposed by Kearsley and Shneiderman (1999). Engagement theory "is intended to be a conceptual framework for technology-based learning and teaching" (para. 1). Engaged learning means that learners are meaningfully involved in their learning and that the learning tasks "involve active cognitive process such as creating problem-solving, reasoning, decision-making and evaluation" (Basic Principles section); these processes correspond to the higher levels of the cognitive domain in Bloom's taxonomy. The use of these technological devices provides cognitive affordance by supporting language tasks that allow learners to engage in authentic and meaningful language learning, thus helping to optimize the building of knowledge and skills pertaining to language.

Since the young learners can directly interact with the interface, they have opportunities to create and design their own learning tasks; this "Create" component "makes learning a creative, purposeful activity" (Kearsley & Shneiderman, 1999, Basic Principles section). The physical and functional affordances provided by the iPods and iPads contribute to greater learner engagement, which in turn increases learners' motivation to learn because they develop a sense of control and ownership over their learning. The meaningful and purposeful tasks supported by the use of iPods and iPads reflect the necessity to create meaningful and purposeful activities in the language classroom, as advocated by various learning theories. Thus, the different properties of these touch screen technological devices come to play a crucial role in promoting active and meaningful learning, which is a key factor in optimizing the learning process according to learning theories based not only on neuroscience and cognitive sciences but also on engagement theory.

Autonomy of the Learner in Creating Learning Environments and Redesigning Language Learning Tasks

Because of their multimodal nature, the touch screen and mobile technologies such as iPods and tablets provide learners with greater autonomy to engage actively in language tasks designed to provide a choice of tools and learning environments that better support their needs and individual learning styles, in accordance with the principles of UDL (CAST, 2011). With these touch screen and mobile technologies, learners can create their own learning environment through multiple modalities—visual, audio, and tactile, as well as interactive modes—which in turn allow further autonomy by allowing the learner to choose the appropriate modes that correspond to their learning styles and needs (CAST, 2011; Pellerin, 2012b, 2013). Therefore, as indicated in previous studies (Pellerin, 2012b), the touch screen mobile devices also provide interactive and

collaborative contexts that support greater active engagement in the learning on the part of the learners. These findings are also consistent with an earlier study related to the use of iPads in regular classrooms:

> With the iPad, . . . students can learn visually, they can learn through audio, they can touch, or it can be an easier way to have notecards. It manages different learning styles and provides for a complex learning environment that supports retention and critical thinking. (Stansbury, 2010, p. 34)

In various classrooms, students would decide on the tools they would use to demonstrate their learning about a specific Science topic in an assessment task (in the context of French Immersion, the L2 is used to learn about other subjects in the curriculum). With the iPods in their hands, the students recorded their oral responses, and also made video clips of their demonstrations to indicate their understanding of the content learned during the science unit (Figure 3). The students were able not only to demonstrate their own understanding about the subject matter, but also to create their own language task assessment that demonstrated their competencies in language skills across the curriculum.

Figure 3. The learner (Grade 2) demonstrated her understanding of a science concept through her own video recording, which she made using an iPod (https://capsulesorales.csj.ualberta.ca/index.php/les-capsules-video/loral-et-les-technologies-numeriques/loral-et-lutilisation-de-lipod-au-service-levaluation-en-science).

Findings from classroom observation through digital documentation, as well as outcomes from interviews with teachers, reveal higher levels of engagement and motivation in all students during language activities supported by the use of digital technological devices. In particular, many teachers observed that their students with attention disorders benefited by the use of digital technologies, which helped them become more engaged in the second language activities and stay focused on the task at hand for longer periods. Because many of the digital technology devices provide multimodal experiences, students with sensory learning difficulties were more inclined to use these tools to support and scaffold their learning, even if it meant doing the activities repetitively. Usually, the learners chose to repeat the language tasks; thus they gained greater autonomy in the ability to perform the task and increase their level of competency. The evidence of these findings can be demonstrated in the following example. A Grade 1 student who was struggling to learn his alphabet in French demonstrated a lack of interest in practicing saying letters out loud. He became increasingly engaged in learning tasks when he started using the iPod, which allowed him to engage in various multimodal sensory activities. He became very motivated to record his voice saying the names of the letters of the letters in French, and later he listened to the recording with his teacher to assess his knowledge. He even asked his teacher if he could take the iPod home to further practice his alphabet in French, which resulted in the learner creating his own homework.

In the context of early literacy (reading, writing, speaking, listening, and viewing), the young learners were encouraged to read aloud to improve their fluency. Using the iPods, the learners became aware of the video function on the device and decided on their own to create a video of themselves reading. The learners took great pride in viewing the self-made videos and took responsibility for redoing the videos over and over again "to make it better" (as a Grade 1 learner said). The physical and functional affordance of the iPod also allowed the learners to engage in a process of self-evaluation about their reading process. The digital documentation (Pellerin, 2012a) of the reading process contributed to making the learning tangible and visible. In turn, the learners took ownership of their own learning and developed a sense of autonomy and responsibility regarding their learning process (Figure 4).

Figure 4. Grade 1 learners recorded their own reading process
(https://capsulesorales.csj.ualberta.ca/index.php/les-capsules-video/loral-et-les-technologies-numeriques/evaluation-formative-et-sommative-de-la-lecture-documentation-de-la-lecture-individuelle/)

The findings also indicate that touch screen and mobile technologies such as iPod and tablets provide the necessary affordances "in terms of properties" (Gaver, cited in Hartson, 2003, p. 323), as learners can engage in language learning tasks through multimodal sensory media. Once again, multimodal learning promotes greater engagement on the part of the learners, since it responds directly to their learning needs and interests. Therefore, these touch screen technological devices provide *sensory affordance* as well as *functional affordance*, which support multimodal learning—which in turn responds to the various physiological, cognitive, and emotional factors that influence learning (CAST, 2011; Cisco, 2008). The sensory and functional affordance also help promote a greater sense of autonomy, because learners have control over their learning and take responsibility for choosing the best tools to optimize their learning and to best demonstrate their knowledge and skills (CAST, 2011, Pellerin, 2013). Therefore, multimodal learning achieved with the use of iPods and iPads contributes to learner autonomy, which is crucial for successful learning for all language learners (Benson, 2007; Bransford et al., 2000; Freisen, 2009, Pellerin, 2013).

Metacognition and Conscious Awareness of the Language Learning Process

Research on learning has reiterated the importance of metacognition as another important aspect of children's learning. The concept of metacognition is also linked to the concept of conscious awareness under the Vygotskian sociocultural framework in second language acquisition (SLA). Conscious awareness "refers to learner autonomy, or learner ability to regulate their own cognitive processes and, therefore, their own learning, which is encourage by social interaction" (Kozlova, 2013, p. 60).

The findings reveal that the use of mobile devices such as iPods and iPads allows students to record their use of the oral language in various activities, and revisit their work by listening to the audio and video recordings. The revision process allows students to become consciously aware of their strengths, as well as noticing gaps (Ellis, 2005; Schmidt, 2010; Swain & Lapkin, 1995; van Lier, 1996) in their oral competencies in the target language. Students develop metalinguistic awareness through conscious reflection about their use of the target language. For example, students as early as Grade 1 became aware of the lack of French specific vocabulary necessary to describe an object while recording the description of a picture. The following example provides evidence of the emergence of metalinguistic awareness. While one student was engaged in video recording with an iPod his description of a winter scene from a self-selected picture, he became aware of his lack of a French word for the English word "sleigh." The recording provided tangible and visible evidence of the private speech in action which has been described by Vygotsky (cited in Lantolf, 2000, p. 88) as "higher forms of consciousness [arising] in the inner plane." The learning environment created by the learner with the use of the iPod also allowed this inner speech to become visible to the student, in turn becoming a tool to support the self-regulating metacognitive language process.

One of the criticisms often attributed to communicative language tasks is that they essentially focus on the meaning of the content rather than on the form: "the learners' goals and task outcomes are not explicitly language-focused" (Cameron, 2005, p. 30). It is also perceived as one of the pitfalls of programs such as French Immersion in Canada, which also emphasize meaning over form. The students using the iPods and tablets in the study were able to identify some grammatical errors in their speech such as "mon maman" instead of "ma maman." They also started to become aware of the need to use appropriate and well-organized structures in their use of the audio/video recorded language: "Non, tu dois pas dire je suis fini. . . ."

While working in pairs they were also able to able to provide some type of scaffolding to each other in providing the missing French words. For example, they were able to point out the wrong choice of a word while describing a picture "la lune . . ."; "non, c'est le soleil. . . ."

Oral tasks provided another example of mediation by peers. Students in Grade 1 were doing a video in which they provided instructions about how to dress up warm before going to play outside in wintertime in Alberta. One student provided the English words: "and the snow pants"; the other student provided (with higher intonation) the French translation: "les pantalons de ski." In another example from the same activity, one student said, "ca c'est Karen's boots," and the other made the correction: "les bottes . . . les bottes."

Thus, young learners' use of the mobile technologies not only promotes the creation of authentic and meaningful learning environments but also supports and promotes the development of learners' ability to become consciously aware of their language learning process. The use of these technologies also plays a major role in learners' taking responsibility for their own learning, as well as becoming active agents in the evolvement of their learning (Benson, 2007; Bransford et al., 2000; Holec, 1981; Nunan, 1995).

Emergence of Self-Reflective Assessment and Regulation of the Language Learning Process

"Metacognition also includes self-regulation—the ability to orchestrate one's learning: to plan, monitor success, and correct errors when appropriate—all necessary for effective intentional

learning" (Bereiter & Scardamalia, cited in Bransford et al., 2000, p. 12). The use of mobile devices such as iPods and tablets allows students to record their use of the oral language in various activities, and to revisit their work by listening to the audio and video recordings. The process of revisiting their learning process as well as the outcomes of the tasks is more than "judging" the quality of the work according to explicit criteria:

> Through the revision process with the teacher and/or with their peers, the students become aware of their own learning process and become their own observers of how they are learning. They also become aware of their learning strategies, thinking process and the way they construct their own understanding, as well as how they co-construct their knowledge with their peers. Through the process of documenting and revisiting, students become the ethnographers of their own learning process. (Pellerin, 2012a, p. 30)

The use of mobile technologies renders language learning visible through digital documentation (audio and video recordings), providing the learners with new means to self-assess and monitor their own language learning. By revising their own "traces" of the use of the oral language, learners engage in a metacognive process through self-reflection about their oral competencies in the target language, and self-regulate their own language development.

The research provides ample evidence of young language learners engaging in self-reflection during language tasks, supported by the use of mobile devices that allow for the "digital documentation or tangible and visible evidence of learning" (Pellerin, 2012a, p. 14). For example, while doing classroom observation, the researcher was able to witness learners redoing their recordings over and over again. (The students were to first audio record what they wanted to write, as a form of scaffolding to support their writing.) When asked why he re-recorded the oral description of his drawing of a pirate, a Grade 2 French Immersion student was able to explain that he had forgotten some details in his description, and that he need to redo it to be more accurate:

> Researcher: Pourquoi as-tu refait ton vidéo?
>
> Student: J'ai oublié une chose. . . .
>
> Researcher: Quelle chose as-tu oublié?
>
> Student: J'ai oublié de dire le chapeau noir.
>
> Researcher: Et tu as ajouté ce détail dans ta nouvelle vidéo?
>
> Student: Oui.

There was evidence during the classroom observation achieved by the researcher, as well as the outcomes of the interviews with the teachers, that students would use the mobile technologies as tools to monitor and regulate their own language tasks. For example, in one Grade 2 classroom students would first use the oral language to map out their ideas about their story. Then they would record their ideas with the iPods. Once they were finished recording, they reviewed their work as a group by listening to their own recordings in order to evaluate the quality of their group work. Listening allowed students to engage in a conversation about what appeared to be coherent and make sense, and what needed to be changed or improved. Wertsch (cited in Lantolf

& Thorne, 2006, p. 282) has described this type of scaffolding as a "dialogically produced interpsychological process through which learners internalize knowledge they co-constructed with more capable peers." It also supports the extended view of the scaffolding framework to peer interaction, as suggested by Donato (cited in Lantolf & Thorne, 2006) where "learners can scaffold one another or mutually construct assistance in much the same way experts scaffold the performance of novices" (p. 282). This later framework of peers' mediation was supported by a later study involving young language learners in the Early French Immersion program (Pellerin, 2005, 2008) engaged in peer interaction and mediation while completing a collaborative task supported with the use of computers.

 However, in light of the findings of this research, the concept of scaffolding needs to be further linked to the metacognitive framework that includes self-regulation. Mediation by peers also involves self-reflection and regulation of learning. Students involved in the language tasks in which they mapped out their ideas for their story, as described earlier, provide evidence of peer scaffolding and mediation that support this metacognitive framework. This framework also calls on self-mediation, as well as peer scaffolding and mediation, and self and peer regulation of their learning. The tangible traces of language learning provided by the use of mobile technologies allowed students to engage in metacognitive reflection about their learning as well as self- and peer regulation through a second or third recording of their work. Their teacher explained:

> Avec un début, milieu, fin. Fait qu'ils devaient parler ensemble pour savoir qui allait commencer, qui allait continuer et qui allait finir, et comment allait être leur histoire. Après avoir parlé ensemble, puis essayé quelques fois, ils se sont enregistrés avec le baladeur pour voir si c'était logique. Fait qu'ils se sont enregistrés, ils se sont écoutés, pis par la suite ils ont fait des changements et peut-être parfois réenregistré une troisième fois.[1]

Through peer discussion and interaction and the use of mobile technological tools such as iPods and tablets, language learners demonstrate conscious processes of reflection, monitoring, and evaluating, as well as regulation. These conscious processes which correspond to metacognition coincide with a greater sense of autonomy as well as accountability toward their language learning as suggested by many authors (e.g., Hartman, 2001; Holec, 1981; Nunan, 1995). Moreover, these findings indicated that the use of mobile devices such as iPod and tablets by the young language learners provided the necessary opportunities to develop awareness about their learning process and learning content.

Conclusion

CALL task-based approaches were first developed with the learning needs of mature learners (adults) in mind, and focused on language tasks that were linked to real-world tasks (e.g., filling out a form, making an airline reservation, taking a driving test; Long, 1985, p. 89). Moreover, CALL language tasks were developed based on knowledge from the field of applied linguistics and interaction with the computer, and were grounded in second language teaching that reflected

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[1] With a beginning, middle, end. That meant they had to talk to each other to decide who would begin, who would continue, and who would finish, and how the story was going to be. After talking about it, then trying a few times, they recorded themselves with the iPod to see if it made sense. So they recorded themselves, they listened to themselves, and then they made some changes and maybe in some cases re-recorded a third time.

the views of interactionism perspectives as well as communicative approaches to language teaching. To a lesser degree, there was a linkage to interdisciplinary fields of research such as neuroscience and cognitive sciences, which further increased our understanding of brain functions and how learning takes place, as well as theories of second language acquisition grounded in Vygotskian sociocultural theories of language learning (e.g., Ellis, 2003; Lantolf, 2000; Lantolf & Thorne, 2006).

Although literature on technology-mediated learning environments for young English learners abounds (see Parker, 2008, for further discussion), research concerned with task-based CALL for young learners of English and other languages is still very limited. For the most part, such studies perpetuate the same paradigm for designing CALL tasks geared to adult learners, as well as highly structured tasks designed by teachers (Kahn, 2012).

The present research proposes a reconceptualization of the designing of language tasks for young language learners. Such tasks would take into account how children learn, based on learning theories that have emerged from recent research in neurosciences and cognitive sciences (for further discussion, see, e.g., Bransford et al., 2000; CAST, 2011; Friesen, 2009), as well as how they learn languages, grounded in Vygotskian sociocultural theories of second language learning. This research also suggests a shift in shared power between teachers and learners in designing CALL language tasks in the language classroom. Moreover, it suggests a shift toward the use of new emergent touch screen and mobile technologies such as iPod and tablets for young language learners—in particular, use of these new mobile devices to create a new language learning environment (Godwin-Jones, 2011) that supports the designing of language tasks that will further contribute to the optimization of the language learning process, as well as the active engagement of the learners in self-reflection and regulation of their language learning.

It is also hoped that this research will further contribute to the body of knowledge in the field of language teaching and CALL, especially research focusing on young language learners. Such a reconceptualization of task-based learning among young language learners suggests a shift and toward learning-centered approaches (Cameron, 2005) that focus on the needs of the young learners, as well as the development of greater autonomy on the part of the learners and a greater sense of agency over their learning.

The existing research demonstrates that in general, using mobile devices in the classroom is beneficial for learners and the learning process (King, 2012). Also, an increasing number of studies in the field of education of young children support the use of technology by young learners (National Association for the Education of Young Children and the Fred Rogers Center for Early Learning, 2012). Such research contributes further to this growing body of knowledge in the field of language learning for young learners, especially in technology-mediated learning environments.

Nonetheless, there is not much research on the topic of touch screen tablets and mobile technologies for young language learners; as explained earlier in this article, most of the available research regarding CALL has addressed the use of mobile technologies such as smartphones (see, e.g., review on MALL, Burston, 2013) with adult learners and intermediate level learners. More studies are needed to further build our knowledge and understanding about how emergent touch screen and mobile technologies such as iPods, tablets, and smartphones can support language tasks and contribute to optimizing the language learning process of young

language learners, as well as promoting learners' autonomy and sense of agency over their learning.

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