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SOMMAIRE

Multimodal (self-)feedback to foster metacognition in a second language writing environment: the teacher's perspectives

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Résumé

Malgré de nombreuses recherches sur le feedback correctif, très peu d'études ont tenté d'enquêter sur le rôle du feedback dynamique fourni par l'élève et sur la manière dont il favorise la métacognition opérationnelle. Dans cet article, nous discutons du concept complexe de métacognition, le processus multicouche d'écriture en tant que locus de métacognition, et la capture en temps réel du comportement de l'apprenant en L2 par la technologie de capture d'écran (SCT). Finalement en nous appuyant sur une étude antérieure (Hamel, Séror et Dion, 2015), nous proposons le regard de l'enseignant les comportements observés au cours de l'étude initiale en présentant trois (3) séries de questions, observations et recommandations.

Mots-clés : écriture en langue seconde, métacognition, technologie de capture d'écran, rétroaction multimodale, conception de tâches, processus d'écriture.

Abstract

Despite considerable research on corrective feedback, very few studies have attempted to investigate the role of student self-given dynamic feedback and how it fosters operational metacognition. In this paper we discuss the complex concept of metacognition, the multilayered process of writing as a locus of metacognition, and the real-time capture of L2 learner behaviour through screen capture technology (SCT). Drawing upon an earlier study (Hamel, Séror & Dion, 2015), finally we offer the teacher's inside look at behaviors observed during the original study by presenting three (3) sets of questions, observations and recommendations.

Keywords: second language writing, metacognition, screen capture technology, multimodal feedback, task design, writing process.

1. Introduction

Numerous research studies have set out to examine the effects of corrective feedback (CF) on the written work of second language (L2) learners (e.g. Ellis, 2010; Hyland & Hyland, 2006; Ferris, 2006). Some studies have investigated how feedback can help L2 learners improve their "editing and revision skills" to become more self-directed writers who can eventually write in their L2 autonomously (Van Beuningen, 2010). Others, adopting a cognitive approach to CF, have studied whether (and how) the feedback provided by L2 teachers will lead to the development of L2 (Manchón, 2009; Ellis, Sheen, Murakami, & Takashima, 2008; Ortega, 2009; Sheen, 2007). This psycholinguistic lens has helped researchers examine the cognitive and communicative aspects of feedback not as a means that helps L2 students to learn to write better but rather as a process that contributes to the cycle of writing to learn (see Manchón, 2009 and Manchón, 2011). Yet other studies have explored different modes and forms of feedback: oral or written, teacher or peer-generated, computer-mediated or face to face, summative or formative (Hyland, 2003; Ferris, 2006; Leki, 2006, Hyland & Hyland, 2006).

At the core of all feedback forms mentioned above lies the "black box" of metacognition. Unless we address the complexity of metacognition, the feedback loop is incomplete at best because it does not include the learner as the initial and pivotal segment of the learning chain. But how can we address this complex entity? Technology available to L2 teachers and learners has facilitated the feedback process by making the black box more accessible.

Screen capture technology (SCT)—also referred to as screencasting, video screen capture, video screen technology, and video capture technology— is believed to be an efficient tool that captures the actions of a learner while writing in their L2. This distinctive feature of STC offers a more direct access to a more intricate and deeper system of learning to write in a second language (Hynson, 2012). SCT allows both for video and audio recording of the computer screen as well as oral comments made while completing a task. These double-component recordings provide any "spectator" with actual evidence and traces in the recorded video and audio. This evidence can then be considered that of a student-in-action, both in movements and in thoughts. Once these pieces of evidence have been collected, they can be viewed and commented on in the aim of triggering reflection and critical thinking, all operations of higher learning activity. This particular operation can thus be seen as the expression and articulation of what goes on in the black box of metacognition, a form of feedback loop, whether for learners in regard to their learning process and its outcome or for the instructor who, upon seeing and listening to the recording, can appreciate and comment on the student-in-action, learning to write in a second language (See Canny, 2016).

However, the reflection we are about to provide is one of caution. It seems that there is a considerable gap between SCT as a tool applied in a pedagogical context for a more direct observation of metacognition-in-action and its efficiency as a reliable source of information about a learner's metacognitive processes. It is not certain that this tool can truly position the individual as the initial and pivotal segment of the learning chain. It can be argued that the SCT does not offer a reliable guarantee of accessing the black box of metacognition in action only through its capacity to view/record and/or listen to accounts of the metacognitive processes. Everything depends on what the learners offer to the viewer/listener, on what the learners have to say about their viewing and listening, on what perceptions and interpretations an instructor provides while viewing and listening. However, this caveat should not hamper the presentation of some of the outcomes that SCT makes possible.

What the present article has to offer is more of a "pedagogical pause" for and of reflection, a pause that serves as a moment, and creates a sober distance from where to appreciate what a piece of technology might promote regarding access to the black box versus a more pragmatic appreciation of what it indeed provides access to, and this in the context of one 'experiment' with the SCT in an advanced L2 writing course.

Content and structure of the paper

This paper draws upon an earlier study [1] (Hamel, Séror & Dion, 2015) but develops a stronger focus on the pragmatic quest for metacognition. It aims to determine what happens in a classroom when the pedagogical focus is placed on metacognition and its development. While this paper is based on the data gathered in the research project mentioned above, we intend to offer a teacher's but also some students' inside look at behaviors that were observed during the experiment. For this reason, the present article is to be considered as an issue paper [2], a document that provides an opportunity to inform a reflection on the use of SCT in an advanced SL university writing classroom as soundly and objectively as possible. We view our reflection in this paper as an active way to learn more about metacognition through examining the actual performance of students giving themselves feedback and its implications for teachers. Also, we see this paper as an opportunity to examine conclusions of the primary study from another angle, an insider's perspective. The present reflection is generated by one of the two teachers involved in the Hamel, Séror & Dion study (2015).

This paper is structured in four sections to document and examine some paths and pedagogical practices of practitioners-researchers. First, we discuss metacognition and present some supporting research on metacognition, its nature and importance, and the implications of "tracking" metacognition. Secondly, we focus on writing in another language as the topic of instruction with the added value that writing per se serves as an entry door to access metacognition, making metacognition visible. We then briefly present an overview of research on L2 writing processes and end this section with the challenge of capturing the process of L2 writing to access the "black box" of metacognition, thus introducing the SCT.

In the third section, we examine the design of digital writing tasks that were not specifically designed with the visibility of metacognition in mind but for the completion of which SCT would be used. In the fourth section, the voice of the teacher is "heard" in her appreciation of the feedback opportunities of the experiment, in the "natural" context of an advanced L2 writing course at university level. The paper concludes with final remarks and recommendations from an insider's perspective who had a chance to pause and reflect before deciding whether or not to proceed with another application of SCT for future teaching practices.

2. Section 1: it's all about metacognition!

2.1. Another way to approach writing

In the context of L2 writing, individuals learn to write in order to be able to write on their own. In order to write independently, a learner will, eventually, have to master the entire written code and the rules of a language from orthography to word order, and from the chain of written thoughts to best expressed ideas, to punctuation and voice, and to message and tone. Writing is

cognitively demanding because efficient written communication relies on a mastery of all the components of the written code (Cumming, 2011).

In L2, this mastery is built via "learning to write" (Manchón, 2011), a process during which the learner relies on the support or scaffolding of instructive and pedagogical systems, whether they be instructors and/or any of the available writing tools (dictionaries, spell checks, grammar books, different online sources, etc.). Ultimately, however, this external scaffolding is temporary, and the learner will have to ensure "self scaffolding" if the aim of learning is to reach writing autonomy and efficiency and become confident in one's inner knowledge about the written language. This mastery of writing will in turn serve as a "springboard" to use writing as a powerful learning and communicating instrument for the dissemination of whatever content is to be written about. However, getting to this point requires not only a true mastery of language mechanics and semantics but also a deeper understanding of writing strategies that develop through behaviours and a solid awareness of the self as a writer. This represents a "qualitative shift" in the whole process as this shift operates under the guidance of metacognitive processes, namely those related to self-awareness, self-determination, and self-direction, characteristics generally used to describe people as "agents of their own thing" according to Klume (1982 as cited in Hacker et al., 2009). It is only when the metacognitive processes are closely associated with the act of writing that the written production and its writer will truly benefit from this "qualitative shift". This is what most researchers in the field describe as an additional dimension that is added to cognitive processes, a dimension where the learners activate their own knowledge in combination with the use of their own metacognitive processes, those that are often referred to as "cognition about cognition" or "thinking about thinking". The goal of teaching successful writing makes it imperative that we understand metacognition more, in order to teach it more, so that, ultimately, our students use it more, thereby improving their writing processes and hopefully their production.

2.2. What about metacognition?

Flavell (1976) defines metacognition as people's understanding of their own cognitive processes, products or anything linked to them. Flavell also specifies that "metacognition refers, among other things, to the active monitoring and consequent regulation and orchestration of these [cognitive] processes in relation to the cognitive objects or data on which they bear, usually in the service of some concrete goal or objective" (Tarricone, 2011:2). It could also be linked to what Hacker (1998) labeled as "deliberate monitoring and regulating". Metacognition is complex: "a perplexing, mystifying [...] construct [...], 'obscure', 'fuzzy', 'faddish', 'messy', 'a many headed monster' (Tarricone, 2011:3). Tarricone's "conceptual framework of metacognition" provides evidence of the complexity of metacognition, and this paper understands metacognition as a constant and complex "back and forth" between the components of reflection: definition, conceptualizations, multi-level categorizations, cognition, learning, memorizing, and so on.

Tarricone (2011) also provides evidence that reflection is the "quintessence of metacognition", with "active reflection, [...or] tagged reflexivity, trigger[ing] metacognitive strategies including the self monitoring and regulation of strategies". We consider that self-knowledge and self-awareness must both support and be supported by reflective and introspective processes, a sort of constant reasoning, the "higher level" of metacognition, a level most appropriate at university. Therefore, any training in the area of metacognition at university must generally

work toward a capacity to properly trigger agency on the part of the student. What is agency? Bandura describes it as, "*le pouvoir d'agir*", "*le pouvoir de faire en sorte que les événements surviennent*", "*les actes réalisés intentionnellement*" (2007: 13). What we are looking for is a Self that is active and autonomous in the practice of self-reflection, a Self that can move from the Thinking-Self to the Assessing-Self, students who can provide their own feedback on their performance as the actor or the agent making general writing or SL writing happen. While the proximity and the intertwinedness of the concepts underpinning metacognition, autonomy and reflective practice may seem confusing, these multi-dimensions of learning to write constitute the basis of our context.

This intertwinedness is a *sine qua non* condition of any situation in which metacognition is involved, a weave which is not meant to be confusing even if it sometimes feels like it. In a classroom/teaching situation, we acknowledge that it is multi-faceted, but also and always rich, deep, and insightful. This kind of "appreciation" suits a university population, particularly during the process of learning to write in SL, which is in fact an "immersion" process of active reflective involvement, agency exercises, and informed decisions (Dion, 2011). If writing constitutes, "applied metacognition", [because writing is] a production of thought for oneself [...] under the direction of one's goal-directed metacognitive monitoring and control" (Hacker et al. 2009:159), then the translation of this reflection into an "external symbolic representation" is notable. In learning-to-write in SL, the reflection involves every word, which has to undergo a selection process, a decision-making process as the writer opts for "masculine" or "feminine", "agreements", "conjugations", etc. In fact, writing can only be carried out with constant feedback at all kinds of levels, and this is even more the case in L2 writing where the writer has to be the very first provider of feedback. Feedback therefore seems to be very much present in SL writing, which makes it more traceable, and more visible – especially if the writer is provided with the proper tool.

Accessing the black box therefore seems to be essential when teaching SL writing. However, there remains the caveat of the inherent difficulty of accessing this black box, let alone "seeing it"! The quest for "visibility" has generated interest and even enthusiasm among researchers in writing, especially with regard to process, which includes feedback. Any findings in this area should be of interest for university educators.

2.3. Visible metacognition, possible feedback

Now that it is known that writing is itself metacognition in an applied form, the challenge to address in our context is how to make the metacognitive behaviours implied in writing better known and understood by the student engaged in learning to write. Revealing and accessing the so-called "black box" has been of interest to researchers for a few decades now, and several methods have been deployed to pursue this: think-aloud protocols were used by pioneers Flower and Hayes (1980); the directed retrospection technique was used by Kellogg (1987). More recently, the eye tracking technology was reported on by Hacker et al. as "providing continuous measures of processing time, attention, and effort" (2009:164). Even more recently, Hamel, Séror and Dion (2015) have published on the need to find more ways to track, follow, investigate and give feedback to students during the writing process because of their generalized computer use. Hence, the rise of keystroke logging technology, a new adaptation of the eye tracking technology, and the beginning of the use of video capture. However, this research has largely been done from a perspective "outside the learner", as observations and research

"feedback" on the activity rather than as opportunities for the learner to access the inside "operations" of their own writing processes, consciously and directly observe and utilize what is captured as personal self-feedback. Thus, moving the writers to proceed, act on the process, and the product, in autonomous control of the end results. For researchers, SCT opens the door to "the direction of goals" as described by Hacker et al. (2009; 2009), the monitoring, the control that ultimately allows the translation into letters, words, "agreements", etc. While journals could give feedback on all the above, nothing surpasses real time observation made possible with Screencast technology.

3. Section 2: focusing on the l2 writing process

3.1. Research on L2 writing process and metacognition

The importance of metacognition for L2 makes it essential for researchers to understand and appreciate it. We see the shift from traditional product-oriented research to process-oriented research on L2 writing as a move towards metacognition as metacognition is fundamental to any process.

Over approximately the past two decades, numerous studies have examined the process of L2 writing. These studies include those that have investigated similarities between L1 and L2 writing (Zamel, 1983; Hall, 1990; Uzawa, 1996; Vedder, 1999; Leki, Cumming & Silva, 2008), those that have studied the cognitive aspects of L2 writing (Silva, 1993; Qi, 1998; Chenoweth & Hayes, 2001), and those that have explored collaborative L2 writing (Strobl, 2014; Storch 2005). They have all concentrated on one common theme: the behaviour of learners - their writing strategies, certain skills they utilize or should utilize, things they know they should think about while completing a task. The focus on learner behaviour substantiates our claim above about process-oriented research on L2.

The strategies employed by L2 writers that are of interest to researchers are numerous.

Brainstorming ideas, outlining, drafting, editing and revising are only some strategies that L2 writing researchers take an interest in and collect data on in order to draw pedagogical conclusions. Also, (teacher) researchers may be keen to investigate the use of writing skills such as correct spelling, grammar, lexical use or the interaction of users with available online tools while writing (see Hamel, 2013). The key strategies and skills necessary for effective writing provide researchers with invaluable data to identify and analyze learners' behaviours. However, and as stated above, the focus of this article is on how to enhance *learner autonomy* among L2 writers. To do this, we need not only to access the L2 writers' black box but also, and ultimately, we need to ensure that the learners themselves have access to this black box. Not only the researchers need to know what kinds of decisions learners may make and why, but more importantly learners need to be aware that they are constantly making decisions and need to do so efficiently and reliably.

We maintain that if we have access to the process of writing, we can also access that black box and treat it as an "object" that affects the writing process. Therefore, we adopt a metacognitive approach in investigating the L2 writing process, and believe we can foster metacognition if we use appropriate writing tasks based on the data collected on L2 writers' behaviours. This seems to be the only way the learner will in turn develop the capacity to be informed from within

about any decision related to writing. Learners, therefore, become the object of their own learning.

3.2. Capturing the process of L2 writing to access the black box

The fundamental aim of writing is to convey the intended message of the writer; and so, as Hacker et al. (2009) assert, the production of thought for both the writer and the audience is a desired outcome in writing. This makes writing a social endeavour that necessitates negotiation of meaning at a cognitive level between the two parties involved. However, if we assume that writers technically move from point A to B during the process and that they would like the audience to get the same message, a metacognitive feature also should be added to the process as writers need to monitor their steps. Fowler and Laird (2014), Kellogg (1994), Hayes (1996) and Gourgey (1998), to name a few, are all proponents of the metacognitive monitoring model of writing.

In a metacognitive model, L2 writers develop their own thinking processes (Gourgey, 1998) by selecting metacognitive strategies such as planning and understanding different steps of task completion and reflecting on each step. Instructors utilize scaffolding techniques to help students (self-)regulate writing. Highly-skilled L2 writers are those who self- monitor while writing and employ metacognitive strategies at every single step of their writing, be it planning, drafting, editing, interpreting, evaluating or revising. Making use of established writing strategies helps L2 writers reduce their cognitive load while writing in their L2 and actually improve the quality of their L2 writing (Schoonen et al. 2003). But how can we "capture" the use of these metacognitive strategies? Or, in other words, how can we access and open the black box? We think the most effective way to access the black box is to capture the process of L2 writing.

Despite the growing interest in methods that support students in targeted reflection on and exploration of what writing represents so that they can improve their metacognition and self-regulation as writers, a challenge remains: detailed descriptions of what happens when a writer drafts an L2 text (descriptions of students' knowledge and actions) are scarce (Leki, Cumming & Silva, 2008; Leon & Pigg, 2011). This scarcity is due in part to the difficulty and complexity of the documentation work involved in capturing—authentically and in real time—the vast array of actions and steps involved in writing a text, not to mention the fact that these actions often happen outside the classroom, and over several work sessions. Therefore, the processes students go through remain largely invisible and not observed by the instructor who normally only receives the final written product. The instructor must then deduce rather than observe directly the processes and strategies used to generate the final production.

Fortunately, technological advances have recently opened the door to new ways of evaluating the learning writer's behaviour just as they have literally transformed the act of writing in itself, as most students interact, compose, and work on texts on a computer, a tablet, a phone even, rather than in analogue mode of pen and paper. As technology has transformed the act of writing itself, technology has also provided researchers with opportunities to capitalize on the affordances of digital writing tools: the computer can record actions, activities and events almost automatically as the user and the tool interact, thus creating digital traces of students' behaviour in a digital environment. Among those technologies, video capture has incited the

greatest interest within the teaching community and is seen as a way to strengthen the effectiveness of more traditional approaches (Emmison, Smith, Smith, & Mayall, 2012).

Screen capture technology (SCT), also known as video screen capture (VSC) or video screen technology (VCT), is a software-based or online technology that allows users to capture their computer screens as well as their voice and their image, producing an audio-visual document to share with their instructors, to review their own actions, or to share with others (Hamel and Séror in Caws & Hamel, 2016). SCT seems to be an efficient tool to not only record the behaviour of L2 learners while writing but also analyze L2 writing processes and sequences of events traditionally hidden but no less essential (See Séror, 2013 and Hamel, Séror & Dion, 2015).

What SCT captures then becomes a multimodal 'object' of learning: to the learner, it offers an opportunity to witness this first-hand view of the process, the strategies used throughout this process, and the end product. To the teachers, SCT offers an opportunity to perceive and act upon the "object", thus becoming a new pedagogical practice that can be exploited via task design.

These multimodal resources become an ***object of learning*** in teachers'/researchers' interventions and can serve to reconsider or, in some cases, reshape teaching practices. Teachers as well as researchers are able to draw upon these findings to offer suggestions to their students as well as their colleagues about how to give students constructive feedback based on the behaviours observed in the (video) data file. Other teacher researchers may exploit these multimodal resources to design new tasks that target certain areas they deem important or with which their students need help. Also, in an ideal world when students view themselves at work, they should be able to do the same to a certain extent, even operate more efficiently if trained.

4. Section 3: designing digital l2 writing tasks that foster metacognition

4.1. Reflection about the construct of a task design

Dynamic learner data collected authentically can serve pedagogical purposes, in particular for the design of L2 writing tasks that foster metacognition. We consider L2 writing task design through the combined perspectives of data-driven learning (DDL) (Boulton, 2012) and task-based language teaching (TBLT) (Byrnes & Manchón, 2014) as well as CALL design. Furthermore, we situate pedagogical design interventions within an action-based paradigm (Lier, 2007) in CALL. Such a paradigm emphasizes "the intentional goal-oriented behavior of individuals [... with] action [being] steered and regulated cognitively based on thoughts and feelings. [...]. Furthermore [...it is] influenced socially, [reflecting] communicative as well as internal processes." At the core of any action-based paradigm lies the notion of "agency", one which Bandura (2007) defines as "the personal power to act [...], the individual's influence on one's functioning and environment." Therefore, the situation of pedagogical task design within this paradigm insists on starting from the learners as intentionally goal-orienting themselves, responsible for steering and regulating their actions and decisions, cognitively aware of themselves as empowered actors of their learning processes and productions. Those perspectives consider the importance for students to self-process information, self-observe, make and test hypotheses and therefore construct knowledge or as Johns (2002) states, "become language detectives to explore language data themselves." The *construct* of 'task' as defined

by Ellis (2003) and in particular of the L2 writing task is here at the core of our approach to L2 writing task design.

Samuda and Bygate (2008) define a task as 'a holistic activity which engages language use to achieve some non linguistic outcome, with the overall aim at promoting language learning, through process, product or both' (p. 69, as cited by Nitta & Baba 2014: 114). Hence, these task characteristics: 1) a task must pose some linguistic challenge to promote language development; and 2) a task must prioritize meaning to encourage learners to construct discourse (Nitta & Baba, 2014: 114). Although primarily meaning-focused, a task is a subtle 'marriage' of meaning and form.

In basic pedagogical reality, a teacher must work around the realities of L2 learners, with full consideration of their investment, and their performance in conjunction with the development of their capacities for real communication. What a task can do is to set conditions under which students are asked to perform and develop their L2. A task is a set of inputs that stimulate a resulting output to reach beyond the original input. This output is accomplished as a result of repeated interactions involving the learner with the instructor but ultimately self-involving the learner with the same intent. "Acting out" the task with this task design engages the learning process metacognitively. The pedagogical considerations should provide the learners with the chance to "self organize" their actions within their personal L2 system, as "a consequence of interacting with the task" (Nitta & Baba, 2014). Hence, the role of the task is to 'produce opportunities for optimal language learning conditions' (Nitta & Baba, 2014:107) i.e. for a simultaneous engagement in meaning-making and language processing' (Nitta & Baba, 2014:108).

4.2. The SCT tool: "*Screencast-o-Matic"* and examples of recycling dynamic learner data into task design

Capturing the L2 writing process enables the digital collection of dynamic learner data that can be recycled into teaching interventions (Caws & Hamel, 2013). Screencast-O-Matic (SOM), the tool used for data collection in the original research, is in a sense filling the information gap by altering the locus of learning, which is now deliberately placed in the task to dynamize the learning process. Seeing the results of a SOM unit in real time can be most valuable, and in more than one way. It can serve as a new form of feedback possibility with the teacher literally entering back into the writing situation, but in real time; it thus offers a "prolongation" of direct and possibly more personalized feedback. For the instructor, it can serve to collect data in and from these sessions and use them as occasions and pedagogical moments to guide pedagogical interventions shared directly with the students, or stimulate future task design. Such rich multimodal data provide direct observations collected from various types of visible (and audible) actions and verbalizations of learners while performing digital L2 writing tasks. Underpinning these observations are questions addressing the whole working experience of the writer and, with some luck, accessing metacognitive moments and agency, directly observing the so-called efficiency, or inefficiency, of autonomy in action in the L2 writing task process. These observations can lead to recommendations for improving the writing process more or less directly, or more directly so in the case of task design by the instructor. The intent of the following section is therefore threefold: to show examples of SOM-captured behaviours; to provide examples of possible reflections that require further understanding; and to further

utilize the actions made visible by SOM. It is also possible to assess some added value and recommend avenues for future use.

The following are examples of three sets of "questions-observations-recommendations" that were drawn from a few dynamic learner data which emerged from the original research corpus (Hamel, Séror & Dion, 2015).

5. Observations offering recycled dynamic data for future task design

For the purpose of this paper, the authors have considered an "after-the-fact" approach to some student materials gathered for the original research project by Hamel, Séror & Dion (2015). The idea was to expose some perceived outcomes, not recorded at the time of project, from the use of the screen capture component in an SL writing university classroom. We, therefore, present three (3) sets of observations itemized around three (3) aspects of the research project: using writing tools; improvement; and evidence of metacognition. Each set is organized according to three (3) points: the first is **Questions** as in questions of researchers and practitioners when planning the project. The second is **Observations**, as in the "factually noticed and seen", which include examples of actual SOM observed management of the learning process, the ease or discomfort, the use or neglect of the instrument for the purpose of the learning process, difficulties observed, best practices, in silence or commentary, on what matter, in what depth, consciously or not. After reviewing some of the observations**,** we suggest some **Recommendations**, explicit suggestions for potentially better practices, as a result of a better or a different use of VCT in order to better serve the learning of L2. The three sets are presented as tables below.

5.1. Set 1: using tools

Table (1) shows a set of questions, observations and recommendations regarding the use of available tools and resources by the students. Students at the advanced level in SL writing are well aware of the importance of using linguistic resources. All had been reminded of the importance of securing their decisions. With SOM, it was possible to directly "see" how they fulfilled this important requirement of the assignment.

Questions	Observations	Recommendations
Did learners used online dictionaries or other types of linguistic resources (e.g. translators, grammar checkers, etc.) during the L2 writing task process?	Learners tend to use 'generic' online dictionaries and linguistic resources (e.g. WordRef)	Learners should be explicitly encouraged to actively use 'specialist' linguistic resources (e.g. term banks, collocation dictionaries); These resources could be curated and demonstrated (VSC walk-through, class time practice, FAQ, consultations) ahead of the task process by teachers and peers;

Which ones, when, what for and to which effect?	They mostly consult dictionaries to find morpho-syntactic information (gender and verb conjugation) and translations (L1 to L2); Learners Struggle to find complex lexical units (e.g. collocations) in dictionaries. Learners rarely consider going further while using a consultative tool (dictionary, thesaurus). They rarely practice any form of double checking or even reverse checking.	Dictionary search models could be provided *(showing efficient and less efficient search paths, VSC extracted from the dynamic learner data)*; Learners should observe their dictionary use habits during their L2 writing process (VSC) and critically reflect on them *(guided by questions such as those above; comparing habits with expert models and peers)*.
Did learners use the tools efficiently, in full depth, as metacognitively as possible?	Very little time spent on using tools and overall tools are used incompetently.	These reflective resources of the self should also be curated and demonstrated with a list of avenues of reflection and advice on how to manage those avenues to make them suit the learning process. A discussion on the time factor is essential.

Table 1. Questions, observations and recommendations
regarding the use of available tools by advanced L2 learners

5.2 Set 2: working on improvement

Table (2) shows a set of questions, observations and recommendations about students' work on the improvement of their writing quality. At the advanced level, students have the necessary linguistic skills and acquired strategies to improve the quality of the first draft of their writing. Using SOM during the writing and revision processes offers a window into how they approached this.

Questions	Observations	Recommendations
Did learners attempt to reformulate, correct or rearrange segments of their text during the L2 writing task process?	Learners do often manipulate segments of their text during the task process, more so when revising a draft.	Learners should be trained to manipulate (identify in texts, construct, correct, reformulate) lexical units. Learners should also be trained to understand the impact of contexts, the "profondeur et justesse" of their decision making process.
Was this self-initiated or did it occur as a result of feedback?	Since students showed more of themselves during the revision of the text, most actions were self-initiated, or after their use of online tools.	They should observe their own focus on form and text manipulation habits during their L2 writing process (with VSC).
Which types of linguistic forms did they focus on (e.g. vocabulary, specific grammatical units)?	They tend to focus on *single vocabulary items* (single units) and morpho-syntax (agreement, verb conjugation). Morpho-syntactic correction tends to be more successful than *vocabulary selection or reformulation*, in particular when it involves complex lexical units.	Learners should be trained to attend to collocations, V + prep constructions as well as anaphoric and cohesive and progression markers.
Where these text manipulations successful?	Learners therefore *struggle* with reformulation and its use to connect ideas, sentences, and paragraphs, even at a basic level. As with their use of the resources mentioned above, Learners lack efficient organization, fair factual assessment of the scope of the task and an in-depth understanding of the steps and the time involved in improving writing.	Students should be lead to critically think about these (guided by information providers, one of them being the teacher, but ultimately themselves as learners).
What was overlooked?	Learners tend to *overlook* collocations, *to ignore* text cohesion, progression makers,	In order to fully conduct the revision process to better serve the necessary linguistic and

	anaphora i.e. multi-words, distributed lexical units.	communicative intentions, students need to be trained "to be detectives" of their own writing too. Reading out loud, having an independent reader, slowing the pace of the work could yield improvement.
Why so?	They generally attend to their text in piecemeal fashion, without consistently maintaining the message and its intent.	It is important to understand a text as whole, understand the parts and the totality, and take all text aspects into consideration.

Table 2. Questions, observations and recommendations about working on the improvement of writing by advanced L2 learners

5.3. Set 3: evidence of metacognition

Table (3) presents a set of questions, observations and recommendations on evidence of student metacognition and self-reflection while completing writing tasks. Again, at the advanced university level, students have enough mastery of the linguistic and discourse components of writing in LS to make informed decisions, to think critically of their productions, express various concerns and/or satisfaction with the way they are completing tasks. Metacognitive moments and expressions of self-awareness, self-determination, and self-direction were witnessed with SOM as students practiced as "agents of their own thing" (see Klume, 1982).

Questions	Observations	Recommendations
Did learners verbalize any thoughts (judgements and assessment, strategies, difficulties, agency statements, feelings, questions such as those suggested above; did they compare habits with those of expert models and peers, *etc.)* during the L2 writing task process? If so, when did that occur?	Learners do not tend to verbalize their thought during the L2 writing task process.	Learners should be encouraged to reflect about their writing style. Each writer is unique in his/her way of composing text.
What was the content of the verbalizations, the added value of their thoughts? How did they use the fact that they uttered the	However, when they do, it opens windows into their metacognition, the strategies	But how to assess "judgement", assessment, critical thinking, by which criteria, for what purpose are all signifiers of practicing

content of their reflection out loud?	they use, the knowledge they have or admit they lack, etc.	metacognition actively, efficiently and autonomously.

Table 3. Questions, observations and recommendations
on evidence of student metacognition while completing writing tasks

As seen with the content of the above sets, questions lead the mind to observations, reflections, decisions for future actions, followed by more reflections and decision-making processes. Questions have been as varied as questionnaires in this project. Some could be interested in questioning the timely execution of tasks, the added value of taking more or less time to finish, or being stalled during the writing process, this impression of "going in circles" that is so often mentioned by students when writing in L2. Others could be interested in observing and concentrating on the quantity of the language produced, the nature of the linguistic decisions and choices, their explicitness, their precision. Yet others could focus on the overall quality more than the quantity of actions, and on how to instill this value when pressed for time. The outcome of any L2 writing task carries its load of metacognitive decisions, in turn shedding light on the essence of the task in order to eventually master the complexity, the accuracy, the fluency of the language in question. Not only can teachers seek this type of direct feedback from the task execution itself, but students themselves can do so with proper training.

If complexity, accuracy and fluency are the recognized language performance properties (Vercellotti, 2012), both teachers and students should seek to qualify as well as quantify the decision-making and the execution process as presented or appraised by questions and reflections. This is not to say that SOM should be solely focused on the quantification of the writing process and therefore limit feedback to an exercise of "How many this and that". Any learning comes with the responsibility to integrate the dimension of "evaluation"; in the present case, however, the evaluation will first and foremost be that of the self in action, with the student reaping the most valuable effects from being involved in the task itself, from being the "subject" as well as the "object" of the learning process. The goal of using SOM is to find a way for a learner to activate and benefit from the notion of "self-initiated and controlled progress", as in "more of one's capacity": more self-initiated knowledge, more self- engaged as a reliable, efficient and autonomous learner-writer, more skilled with self and instructor written corrective feedback (cognitive, behavioural and affective). This is the way for both the teacher and the learner to fine-tune their approach and in-depth metacognitive awareness and ultimately, the autonomy of the self about the writing to be written (Han & Hyland, 2015).

6. Conclusion

6.1. Some food for thought

It is fair to say that the introduction of any tool in a learning situation calls for multiple and diverse considerations including common teaching practices, personal preferences, previous experiences, etc. This is the case for learning goals and general in-depth involvement in the learning process. It is therefore important to give proper consideration to any "modified" learning environment to better guide and support students in line with the development of their

L2 writing skills. Students use these visual tools as natural instruments of communication. For them to be using this tech tool "because the project says so" to support them in their learning situation cannot be considered just "business as usual". It is essential to explicitly state the different perspective, one that is outside their normal use of technology. Therefore, there is a need for training, and learning about how to take new risks with the technology and benefit from the "SOM-mirror" to push their learning experience further. It is vital indeed that instructors highlight the affordances of the technological tool in relation to the course objectives by not only explaining its purpose and utility but by making *usages* of it that are targeted and sharply defined. This will help them get their bearings in a new instructional approach and lessen not only the students' but also the teacher's resistance, even if most students mastered the VSC technology and were therefore considered "naturally" able to use it to enhance the metacognitive processes.

As for their general appreciation, students enjoyed working with the SCT. They were generally not shy to show their work environment, even if sometimes viewers could be surprised at what was seen (student's bedroom environment!). Students enjoyed the opportunity to review and modify their writing process and to reflect on it out loud (without the web camera). They also welcomed multimodal feedback (with a web camera) from the instructor on their writing process and product. These students consider SCT "a good technological learning tool." Except for a couple of students, the rest of the class never really used the technology as the intended critical mirror of the self. They simply used it as the more familiar "selfie". But for optimal results, the assignments performed with SCT should be more explicit and precise, combining clear instructions, complementary resources, models and evaluation checklists to help the students perform their SCT under optimal conditions for optimal results. With this in mind, Teacher A was not surprised by the students' limited use of SOM since the outcome was relatively proportional to what she asked for, which wasn't really much.

6.3. From the instantly visible to the usefully visible or beyond selfies for the self

When reviewing how students used SOM, in this case a freelance use of SOM, with no specifics, it was remarkable how students, only by visualization, could come up with interesting comments about their process and products, especially in the first and second assignments. But although the material collected was rich in spite of this "organic" context, Teacher A observed a somewhat disturbing lack of organization in the revision process which in turn seemed to lead to a "skipping" of errors that were as numerous in the structure of the text as in its grammatical and lexical components. More disturbing was the fact that many of these errors were basic, in detection as well as in correction. Also noticeable was the fact, and pedagogic reminder, that students generally work around and according to the given instructions: very few will go beyond those. In fact, some students used SOM to simply read aloud their text without even any intention to improve what they declared as a completed assignment! Other students used SOM somewhat too late in the revision process, considering only minor touch-ups or general formatting of the assignment. In order to make SOM or any SCT better serve the students-users. Teacher A was of the opinion that more specific instructions were needed from the very start of the assignment.

Generally speaking, it is possible to notice and appreciate that with more explicit and specific tasks attached to the use of SOM as well as more instructions pointing in the direction of what to look for in order to make use of what has been noticed, SOM could serve the metacognitive

scaffolding components and strategies of a task more actively and efficiently. Hence, students should be asked to use SOM to explicitly notice various aspects of the process. This could be done by commenting on the organization of the text, the approach to revision, the ideas conveyed in the text, the clarity of expression, etc. There could also be more specifics linked to language itself such as attention to prepositions, collocations, gender, etc. The practice of reflection requires explicit training and educating in "directing the observation process". At the end of the day, even though SOM could be considered as a mirror of the behaviour, it does not necessarily ensure the actual tracking of the problems. Technical training is one aspect of the training, but "training to track and see" (structure, content, language, etc.) is essential if one wants this tool to really serve the goal of developing efficiency and reliable metacognitive autonomy for the writer.

While this tool can be associated to the practice of "Selfie", it is very different from the generally accepted use of "selfies." It may provide a picture one takes of oneself, but this type of selfie is not to be published on social media. Essentially, this "selfie" technology is meant to be used and developed as an instrument to enrich the initiator, the process and the product more than serve as a "message to generate comments and smiles".

Footnotes

[1] To learn more about the research design and the detail of the study, see http://www.heqco.ca/SiteCollectionDocuments/Writers_in_Action_ENG.pdf

[2] Issue paper in French is defined as "document de réflexion" What we present in this paper is in line with what Legendre (2005) refers to as "réflexion", or *" revenir sur [ses] pensées de façon à pouvoir analyser, étudier, examiner et approfondir plus consciemment une idée, un projet, une problématique, une situation, une connaissance, etc."*

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