"*THE TABLET IS ON THE TABLE!*" - THE NEED FOR A TEACHERS' SELF-HETERO-ECO TECHNOLOGICAL FORMATION PROGRAM

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Abstract

The Federal Government has started the distribution of tablets to teachers in public schools in Brazil. However, no preparation has been provided to guide professionals on how to use the tablets for pedagogical purposes. As a result, teachers have been carrying tablets around or leaving them alone on their classroom tables. Considering this situation, my discussion is focused on the reflection upon the possibility of adopting a ternary conception of formation processes – the *self-hetero-eco formation process* ─ to help teachers learn how to use tablets for educational purposes; and on the potential of such a process to congregate teachers in the joint creation and maintenance of a Didactic Digital Material/App Data Bank.

Introduction

The Federal Government has started the distribution of tablets to a great part of teachers of English (and of other disciplines) in Elementary and High Schools in the city of São Paulo and in the main capitals of Brazil. Regardless of the undeniable value of such an ambitious initiative that has affected public institutions, no orientation has been provided to instrumentalize these professionals to employ tablets as a didactic resource to be used in class with students or out of class to prepare lessons and/or evaluate ready-made materials available on the Web. Consequently, the *yellow tablets* have been carried around by teachers and left alone on classroom tables without any meaningful use or consistent pedagogical practice. This is the context that motivates the discussion brought by this paper, which is focused on the need to provide technological formation to those professionals who have a tough workload (around 50 classes a week), little free time, and, rare, non-privileged financial conditions to take specific extension courses on educational technology.

Grounded on *complexity* principles (Morin, 2008, 2010), and especially on the studies made by Moraes (2007), Freire (2009), and Freire and Leffa (2013), this paper presents some reflections upon the possibility of adopting a ternary conception of formation processes to help teachers learn how to use tablets for educational purposes. This particular ternary conception associates three dimensions together ─ *self, hetero*, and *eco* ─, so that they may provide teachers' education with an original and, to some extent, more meaningful connotation.

By understanding technological formation as a *complex,* interwoven, non-fragmented ternary process, that is, a *self-hetero-eco formation process* (Freire, 2009; Freire & Leffa, 2013), it would be somehow possible to deal

with what is now taking place in Brazilian public schools and, from this ternary perspective, congregate teachers of English (and hopefully of other disciplines) in the creation and maintenance of a *Didactic Digital Material/App Data Bank* – as will be discussed in this paper.

In order to reach the two objectives that guide this paper ─ firstly, to reflect upon the possibility of adopting a ternary conception of formation processes; and secondly, to illustrate the potential of a *self-hetero-eco formation process* to bring together teachers in the joint creation and maintenance of a Didactic Digital Material/App Data Bank — this paper starts by presenting some digital resources and indicating what route they took to enter the educational field. After that, the *self-hetero-eco formation process* and its technological perspective are addressed in their conceptual features and educational implications. Following this section, the paper narrows its focus on the tablet as a didactic tool and on ways of evaluating and preparing digital materials so that a data bank may be generated and managed by teachers. To conclude this paper, some final remarks are presented in order to reflect upon the relevance to apply a *self-hetero-eco formation process* to develop teachers in a technological sense so that they feel more confident to integrate tablets in their professional practice.

Digital Resources and their Route to Schools

Looking back over the last four decades, it is perceived that the advent of computers may be considered a "watershed" (Bottentuit Junior, 2012, p.126) that provoked, among many visible transformations, the automatization of routines in all knowledge areas; new forms of accessing, processing, conveying, and storing information; new work-related routines; the creation of a "both extraordinary and surprisingly sustained speed" (Levy, 1997, p.1), and the creation of never thought of jobs and professions.

Following computers, comes the Internet with a whole set of possibilities. It allows us to get involved in a multimedia environment, in the cyberspace, breaking down relevant and previously steady concepts such as *distance*, *space* and *time*. The Internet has then modified the "communication paradigm" (Bottentuit Junior, 2012, p.126) in content and form, generating meaningful transformations in interpersonal interaction. Communication has changed from letters to e-mail, from fax to scanned documents attached to messages, from telephone calls to Skype or Voip sessions, from face-to-face or phone conversations to SMS or *whatsapp* messages ─ to mention some of the current moves. In other words, *fast* becomes *simultaneous*; speed and rhythm have been transformed in an irreversible way.

Nowadays, besides computers connected to the Internet, there are other kinds of portable technological devices, such as notebooks, netbooks, cellphones, smartphones, and tablets, for instance, which have been constantly updated, and which are responsive to the features of *mobile learning* or *m-learning*. According to Rodrigues (2007), *m-learning* corresponds to a learning modality through the use of mobile devices with wireless communication, in a transparent way, with a high degree of mobility. O'Malley et al. (2003) seemed to agree with this perception by understanding mobile learning as

taking place when the learner is at a not fixed, predetermined location or when s/he takes advantage of the learning opportunities offered by mobile technologies.

 Mobile devices — particularly cellphones, smartphones, and tablets — have then become very popular and preferred by users in general, due to some specific features. They are portable, wireless, and easy to connect to the Web from almost any place like shopping malls, cafeterias, restaurants, bookstores, theaters, movie theaters, parks, supermarkets, and so on.

Considering that this paper is focused on tablets, it is worthwhile exploring its concept. Tablets may be defined as small, lightweight, mobile devices that may be used either vertically or horizontally, just like an ordinary notebook (Bottentuit Junior, 2012).   Tablets have a digital keyboard and a web browser, supporting the access of various kinds of files (*pdf*, *word*, *excel*, etc.), and specific applications (*apps*). Compared to cell phones and smartphones, they have a bigger and more comfortable screen: a feature that makes them an excellent tool to access and consume information available on the Web. However, compared to computers, they also reveal limitations. For example, the reduced size of the keyboard associated with the size of the screen impacts negatively on the typing of long texts.

This quite brief summary displays the variety of technological options we have when the need is to choose a device to be used for educational purposes. Nevertheless, the route they took to the educational field was not that simple and natural, particularly when the teaching of foreign languages is taken into consideration.

According to Warschauer (1996) and Warschauer and Kern (2000), the introduction and use of computers in the English learning process — known as *computer-mediated language learning*, or CALL — is depicted by three relevant phases. Although dates are not strictly fixed, the authors stated that the first phase, which took place between 1970 and 1980, might be named Structural CALL, due to the emphasis given to accuracy and to the structure of the language. From this perspective, computers were used as tutors in drills and practice that basically aimed at memorization.

The second phase, that took place from 1980 to 1990, revealed a more communicative perception of teaching and learning, aiming at language *fluency*. The use of computers therefore reflected this perspective, and machines were used for communicative practice in which structure and grammar were evoked implicitly. This phase is then known as *Communicative CALL*.

The third phase, identified by the authors as *Integrative CALL,* has been taking place in the 21st century. In this phase, the massive influence of the Internet and its multimedia resources have been crucial to allow access to authentic multimedia material and to the language that is actually spoken by native speakers with all of its linguistic, social and cultural peculiarities. The focus moves to *agency,* and students are required to be important agents in their own

knowledge construction, also counting on the help of computers and all multimedia resources available.

The argument presented above synthesizes the way computers enter foreign language education in the United States ─ the country on which the mentioned authors focused their research. Nevertheless, the landscape in Brazil is quite distinct, with other features, other educational nuances and, consequently, other historical sequence and influences.

To some extent, Reis (2010, p.58) responded to the challenge of investigating the Brazilian context by undertaking a state of the art on CALL in which she considers Ph.D. dissertations, MA theses, journal articles, and book chapters as references. She concluded that CALL in Brazil may be also divided into three phases (see Table 1).

Table 1

CALL Phases in Brazil

Phases		Topics (References: Publications, Theses, Dissertations)
1ST Inclusion of technologies in foreign languages classes	1998-2000	The use of Internet in universities and schools
	2000-2002	Digital literacy
2ND Use of technology in the preparation and utilization of didactic materials	2002-2004	Preparation of didactic material for the digital context and pedagogical online intervention
	2004-2006	Digital genres in cyberspace
3RD Evaluation of language activities in digital context and reports of experience about teaching mediated by computers	2006-2009	Activities and practices in cyberspace

Although not included in Table 1, but mentioned in the author's PhD thesis (Reis, 2010), two pioneer researchers should be mentioned when the history of CALL in Brazil is focused on: in 1983, Leffa started investigating CALL by researching on an online dictionary, and, in 1992, Freire concluded her MA research (*Interaction and Computerized Simulation: A Proposal on CALL*), which is the very first research on CALL in Applied Linguistics in Brazil. These research works reveal that the introduction of computers in foreign language education had in fact already started in the 80's, before the Internet's advent, therefore, and before 1998, the date which indicates the beginning of the first Brazilian phase, according to the mentioned author's investigation.

As illustrated in Table 1 and expanded by the comment that follows it, the research on CALL started in the 80's; was focused on the Internet from the end of the 90's, and has been intensely developed from that decade on. Compared to other countries, it is possible to assert that the introduction of computers in the Brazilian educational field began late; nevertheless, its evolvement happened very fast to the point that it has reached almost the same extent of some developed countries. Unfortunately, similar assertion cannot be made about mobile devices. In this case, application and research are in an initial phase in Brazil and in many countries. We still have a lot to do to use these technological tools, investigate them, and learn from practice.

The *Self-Hetero-Eco Formation Process* and its Technological Perspective

As mentioned in the Introduction, teachers of English have received tablets but no orientation on how to apply them in their work-related practice. In other words, they lack technological formation ─ provided neither *pre-service* nor *in*-service ─ to explore the potential tablets (and technological tools, in general) have in order to use them in the classroom with their students and out of the classroom to prepare their lessons.

The emphasis on the terms *pre-service* and *in-service* is deliberate to indicate that the conclusion of the undergraduate course becomes the turning point that, by providing the student with a *certificate*, defines his/her entrance in the teaching career and qualified stay in the job market. This certificate ─ which means the official license to teach ─ distinguishes therefore two linear moments in the formation continuum: first comes the preparation to practice ─ or the *pre-service moment,* ─and after that the autonomous professional practice ─ or the *in-service moment* (Freire, 2009).

However, this is only a *time* distinction based on *having* or *not having* finished the undergraduate course. In fact, it does not correspond to what often happens in Brazil where many undergraduate students already teach in private language courses, for instance. In this case, because they are inserted in the job market, they are not in a *pre-service* situation anymore; but considering their student status, they may be kept under this label.

This example illustrates a contradiction that reveals that teachers' formation should be named according to other references because this linear, temporal one showed itself weak and unreal for what has been actually happening, at least in some contexts. A unique concept is then necessary: a concept that may be more responsive to the contradictions and ambiguities of a complex ~~life~~ reality, one that may indicate that teachers' formation may happen everywhere and that it is an endless, lifelong process. My claim is that the *self-hetero-eco formation process* (Pineau, 1988; Pineau & Patrick, 2005; Moraes, 2007; Freire, 2009; Freire & Leffa, 2013) can respond to such features, as explained below.

Pineau (1988) developed the *tripolar formation theory,* which is composed of three movements ─ *personalization, socialization*, and *ecologization* ─ that generates three formation poles, respectively:

- *self formation* that is depicted by the action of the self as an individual and social subject, who becomes responsible for his/her own formation, and who becomes the subject and object of his/her formation;

- *hetero formation* that is represented by the action of individuals on others, indicating the social dimension of the formative process and, therefore, the co-formation; and

- *eco formation* that is evidenced by the action of the environment on individuals, revealing the environmental and ecological dimension of the formation process.

Considering the argumentation presented by Pineau (1988, 2006), Pineau and Patrick (2005), and Moraes (2007), Freire (2009, p.19) reflected upon the viability of interpreting such a ternary conception from the perspective of four distinct dimensions: *action, subject, formation object*, and *relations*. Her interpretation, which was reviewed by Freire and Leffa (2013, p.11-14), is summarized in Table 2.

Table 2

Ternary Conception of Formative Processes: A Contrasting View

<table>
<tr><td rowspan="2"></td><td rowspan="2"></td><td colspan="3">Poles</td></tr>
<tr><td>Self Formation
(Personalization)</td><td>Hetero Formation
(Socialization)</td><td>Eco Formation
(Ecologization)</td></tr>
<tr><td rowspan="4">Dimensions</td><td>Action</td><td>Individual
(action of the individual on the *self*)</td><td>Social
(action of the individual on other individuals)</td><td>Ecological
(reciprocal action of the environment on the individuals)</td></tr>
<tr><td>Subject</td><td>Individual</td><td>Social</td><td>Ecological</td></tr>
<tr><td>Formation Object</td><td>The subject</td><td>Co-formation</td><td>Relationship between human and environment</td></tr>
<tr><td>Relations</td><td>Internal
(mainly)</td><td>External
(mainly)</td><td>Ecological
(mainly)</td></tr>
</table>

Table 2 displays the continuity that, according to Pineau (2006), connects all the constructs on which the ternary tripolar theory is grounded. They are depicted as essential parts of an inconclusive whole. They are always articulated and they alternate themselves continuously; therefore one of them may assume a central position in a specific moment of the formation process and may then change this position the moment after. From this perspective, each pole is defined, contextualized and emphasized only if contrasted to the others that complement it and, simultaneously, evidence its identity. There is no linear connection in the conception of the tripolar theory. The poles are interwoven together, sharing a relationship of complementarity that indicates

that they are complex constructs that obviously generate an emerging complex formation process.

Considering the interconnectivity that links all the constructs of the tripolar theory described, Freire (2009) suggested the term, an hyphenised written form ─ *self-hetero-eco formation* ─ which visually emphasizes "the simultaneity of the constructs that constitute it, [and] lets the formative processes free from a reductionist and simplified view, while simultaneously sheds light on individuals, their peculiarities, their interrelationships and the environment in which they constitute, develop and transform themselves" (p.2).

The *self- hetero-eco formation* view on formation processes evidences a whole set of constructs (poles and dimensions), as well as their interrelationships, whose complementarity makes the process unified, illustrating its multidimensional and multi-referential nature. These qualities indicate an undeniable systemic complex identity that gives rise to a non-totality feature, and that reveals itself as an ongoing, ever-evolving, lifelong process, as a teachers' formation process is expected to be.

If teachers' education is a *self-hetero-eco formation process*, teachers' technological education should be understood from the same perspective, since it is embedded in this concept, which is a kind of umbrella term. According to Freire and Leffa (2013), *self-hetero-eco technological formation* may be defined as an

> Action of the environment ─ a face-to-face action and/or a digital action ─ on individuals, which is mediated by singular tools, practices and languages, associated to these individuals' critical reflective action on the environment, on others, and on themselves. Individuals then use these tools, practices and languages-adequately in the construction/ deconstruction/ reconstruction of knowledge and in their critical insertion in the face-to-face and digital world, as citizens who are information generators, guardians and interpreters, and who may guide themselves to the whole formation of the self as human, social, technological, and planetary individuals. (p.15)

This definition emphasizes the action of the face-to-face or digital environments (*eco*) on individuals (*self, hetero*) who, mediated by tools (*eco*) and critical reflective actions (*self, hetero*), act on the environment (*eco*). When these individuals (*self, hetero*) appropriate unique tools (*eco*), they (*self, hetero*) may construct/ deconstruct/ reconstruct knowledge (*self, hetero*), and make new insertions in the environment (*eco*), provoking transformations on themselves (*self, hetero*) and on the environment (*eco*) where they are acting.

Bringing this definition to school settings and considering the tablet as the technological tool in question, it is possible to perceive that the subtle imposition to use the tool in the classroom (*eco*) has been generating an environment disruption (*eco*) that has impacted on the teacher of the English (*self*) who has no technological expertise to use this new device (*self*), and neither time nor financial conditions to take specific courses to learn how to

apply it to his/her professional practice (*self*). On the one hand, this teacher may do nothing; just forget the tablet on the table (*self*). On the other hand, s/he may start looking for information (*self*) on books and on the Internet. Perhaps, s/he decides (*self*) to talk to his/her peers (*hetero*) to find out any possible alternative or a way to study together (*hetero*) on how to explore the new device (*eco*).

In this sequence of actions, *personalization*, *socialization*, and *ecologization* showed themselves evident and associated together with them, the ternary tripolar theory emerged from what seems to be a quite common scene in schools. This is an illustration of a natural manifestation of the *self-hetero-eco formation process*. The sequence of actions happened in a spontaneous way, as a kind of problem-solving strategy, and not as a shared knowledge construction and formation process. These teachers would certainly benefit much more from situations like that, if they were aware of this process and on how to develop it ─ as presented in the following section.

Using Tablets for Educational Purposes

Leffa and Freire (2013, p.28) stated, when mentioning face-to-face or distance education, "There are three essential types of human communication and interaction: *one to one*, *one to many*, and *many to many*. " This quotation is relevant to start our discussion with because tablets are inserted in classrooms in which interpersonal interaction occur among one teacher and around 40 students at a time.

By receiving one tablet, the teacher perceives him/herself handling the technological tool in front of a large group of curious students who have nothing similar in hand. In this case, the difficulty the teacher may have in dealing with the tool itself is certainly aggravated by the fact that any suggested activity involving the whole group seems totally impossible, and any activity directed towards some of the students requires the remaining ones doing something else while waiting for their time to use the tablet, which is quite a difficult situation to cope with.

Deciding how to organize the students and what to do with the tool requires the teacher to leave a kind of familiar "comfort zone" in order to enter a complete unknown "risk zone" (Borba & Penteado, 2007, p.100), in which the tool stimulates the students' curiosity while awaking the teacher's apprehension. In this the scenario, the awareness of the *self-hetero-eco formation process* could help teachers to overcome technological barriers to reach individual and common educational objectives, by selecting one of the following alternatives ways of working.

- The teacher of English shares the tablet with one group of students at a time for them to research on a particular topic to be presented in class. Other groups may research on the same topic or on a complementary one in other sources to compare the information collected. All the groups may use the tablet to prepare slides for the final presentation. The teacher may look for applications (apps)

associated to the topics discussed and complement/expand the final presentation.

- All teachers of English in the school get involved in the design of tasks, discussing their difficulties and limitations in using tablets and sharing ideas that may empower them in manipulating the technological tool. To accomplish these tasks, they can include photos, films, videoconferences or textual communication, exploring the Internet connection through tablet mediation in order to establish the interaction between students from distinct groups .

- All teachers in the school get involved in the design of an interdisciplinary project, which involves the participation of various groups of students that will develop different parts of the whole by using different resources/applications available on tablets. The final product of the project may be presented in the digital format, accessed by tablets.

Reflecting upon the first alternative suggested, the teacher, although not technologically expert opens up room for experimentation by sharing the tool with the students and asking them to complete a quite simple, basic activity. In so doing, s/he preserves his/her face and gives the students an opportunity to spontaneously express themselves through the tool and its potential. The teacher is subtly leaving his/her *comfort zone* and entering the *risk zone*, daring to suggest a kind of different activity. In other words, the teacher creates a *self-hetero-eco formation* context, involving his/her students s/he learns from the situation, and from/with his/her students as well.

Considering the second alternative, the initial emphasis perceived is in a co-formation context in which teachers of the same discipline, associated together, design a task while discussing it and their emerging limitations. Nevertheless, in exchanging what they know and do not know, they may learn from one another and develop themselves by feeling more empowered to risk and use the tablet new resources and applications.

The third alternative displays a group of teachers engaged in an interdisciplinary project, sharing knowledge and caring for the students and for themselves. This is the most evident scenario of a *self-hetero-eco formation* context in which the term formation is understood from the teachers' and from the students' perspective. In this sense, it contemplates the more accurate meaning of the concept since it creates opportunity for evolvement of both agents of the teaching-learning process.

The alternatives here presented illustrate situations in which teachers are naturally involved in *self-hetero-eco formation* contexts: they learn from the situations they live in, even without noticing they are learning; they leave the comfort zone to enter the risk one together. Nevertheless, they may document their experiences, keeping records of the activities, tasks, or projects done, their objectives, results, and comments. They could create record files like those suggested in Figure 3 , which will then form a data bank.

By collecting information and describing all details, teachers can jointly create and manage a *Didactic Digital Material/App Data Bank,* which may be used by all the teachers in school or may be exchanged amongst institutions. These records materialize the actions done in the classroom and, therefore, what each teacher has been doing with his/her students with the mediation of technological tools. In other words, the records reveal movements of *personalization*, *socialization*, and *ecologization.* They also provide the teachers with a record of their technological development as users ─ which contributes to the perception of the teachers' own empowerment. To some extent, the data bank provides the awareness of the *self-hetero-eco-formation process*. If teachers reflect upon what and how they do what they actually do, they perceive that they have also evolved in a broader way: in a theoretical, professional, technological, and especially in a personal way.

DIDACTIC DIGITAL MATERIAL/APP DATA BANK		#1
TITLE		
NATURE	[ ] Activity [ ] Task [ ] Project	
	[ ] Disciplinary [ ] Interdisciplinary [ ] Transdisciplinary	
	Discipline(s) involved:	
COORDINATOR(S)		
TEACHER(S) INVOLVED		
INSTITUTION(S) INVOLVED		
STUDENTS' GRADE(S)		
ORGANIZATION	[ ] Individual [ ] Pairs [ ] Groups of ...... students	
OBJECTIVES	• Linguistic: • Social: • Cultural: • Behavioral: • Artistic: • Others:	
TECHNOLOGICAL TOOL(S)		
OTHER MATERIAL(S)		
DESCRIPTION (DEVELOPMENT)		
RESULTS		
COMMENTS (difficulties, limitations, advantages, suggestions, etc.)		

Figure 1. Suggestion for record file.

Final Remarks

Teachers of English in Brazil have been living an ambiguous moment to deal with. On the one hand, they have received a *tablet*, a quite modern technological tool to insert in their professional practice; on the other hand,

they have not received any kind of orientation on how to use this device as a pedagogical resource. As a consequence, some teachers just do nothing, whereas others have been looking for alternatives, reading articles, talking to other teachers, and trying to find ways to learn how to use that particular tool.

This second movement indicates a peculiar kind of formation process, the one in which the individual gets responsible for his/her own formation (*personalization*); interacts with others to expand possibilities, co-construct knowledge to reach co-formation (*socialization*), and interacts with the environment with/from which s/he learns (*ecologization*). This movement illustrates the *self-hetero-eco formation process* -- a complex process that teachers sometimes do but are not aware of it all the time to benefit more from it. As evidenced by the examples provided in this paper, this process may help teachers create steady links amongst themselves at school and resolve many difficult situations such as the need to overcome the lack of technological skills to use tablets.

Considering the insertion of technological tools for educational purposes, the idea of congregating teachers together and jointly creating and maintaining a Didactic Digital Material/App Data Bank may not only impact on the use of the tablet itself but also on interpersonal relationships, intensifying respect, companionship, friendship, among other very important ties that should link people together.

By accomplishing the two objectives suggested here, tablets may not be left alone on the table anymore.

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