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CALL and the development of learner autonomy: Towards an activity-theoretical perspective

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Abstract

While the concepts and principles associated with learner autonomy underpin a broad range of CALL applications and research projects, current debates and research paradigms in CALL do not provide adequate tools and models to investigate in depth the relationship between CALL and the development of learner autonomy. This paper explores the potential of cultural-historical activity theory to study this relationship. Starting from the complex and multidimensional nature of learner autonomy, it highlights some of the weaknesses in the CALL literature addressing some aspects of this relationship. Following a presentation of the main tenets of cultural-historical activity theory (CHAT), including the notion of contradiction which is at the core of CHAT, it then seeks to demonstrate how activity theory can assist us in rethinking our understanding of learner autonomy in the context of technology-rich language learning environments and in formulating suitable criteria and questions, which can guide judgemental and empirical analyses. The paper concludes by illustrating some of the principles explored through examples drawn from an activity-theoretical judgemental analysis of a French module delivered to first year students in Dublin City University.

1 Introduction

The concept of learner autonomy, originally defined by Holec (1981: 3) as the "ability to take charge of one's own learning", has been the focus of renewed interest in the last decade, both in the area of educational research in general and in applied linguistics in particular. Benson and Voller (1997: 5) maintain that "the promotion of autonomy in language learning has links to developments elsewhere in the field of education [...] and has been sustained and nourished by innovative work in the field of self-directed learning and self-access". In turn, self-access and self-directed language learning have been encouraged by the "growing role of technology in education" (Benson & Voller, 1997: 6).

Our understanding of learner autonomy often stems from the idea of independent language learning. Early independent learning environments aimed to provide a context for

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the exercise and the development of learner autonomy, through the provision of self-access facilities, whether physical (e.g. as part of a language centre) or virtual (e.g. through the use of telecommunication technologies or Virtual Learning Environments). These contexts, along with the language teaching methodologies associated with them, presented the background for early definitions of learner autonomy: the autonomous language learner takes responsibility for her own learning and can do so without teacher intervention or outside a formal curriculum (Dickinson, 1987).

These earlier conceptions, however, soon constituted a restrictive definition of learner autonomy (Little, 1990; Benson, 2001) and have led to many difficulties for self-access facilities that have often remained underused (Mozzon-McPherson & Vismans, 2001). Benson (2001) further argues that self-access centres may even prevent the development of learner autonomy:

> "One of the important lessons of the spread of self-access over the past three decades, however, is that there is no necessary relationship between self-instruction and the development of autonomy and that, under certain conditions, self-instructional modes of learning may even inhibit autonomy." (Benson, 2001:9)

Autonomy is both independence and interdependence (Little, 1991; 1994). Independence entails taking responsibility for one's own learning, setting objectives, and making informed pedagogical decisions based on some form of self-evaluation. However, learners exercise their independence within a specific sociocultural context where interdependence, through socialisation and the nature of their interaction with peers and teachers, will impact on the levels of control they exercise and develop (Little & Dam, 1998; Benson, 2001). Conversely, Benson (2001: 49) argues that "control over learning necessarily involves actions that have social consequences". The development of learner autonomy can be seen not only as the development of 'individual' autonomy but also as the development of a social, and even political autonomy through which a group of learners will *collectively* take responsibility for and control of their learning.

Autonomy is therefore a complex multidimensional concept. Following Benson's (2001) approach, it can be defined in terms of control over the learning process and content, which both involve individual learners within their constituted social groups. Autonomy encapsulates individual and social constructs. These constructs are interrelated and influence each other over time, thus conferring a developmental status to autonomy. Yet, the tension between individual and social, or between independence and interdependence, is not that easily resolved.

Furthermore, the explosion of the Internet and the advances of mobile telecommunication technologies have added a new dimension to the concept of learner autonomy, that of electronic literacies, as suggested by Shetzer and Warschauer (2000: 176):

> "Autonomous learners know how to formulate research questions and devise plans to answer them. They answer their own questions through accessing learning tools and resources on-line and off-line. Moreover, autonomous learners are able to take charge of their own learning by working on individual and collaborative projects that results in communication opportunities in the form of presentations, Web sites, and traditional publications accessible to local and global audiences. Language

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> professionals who have access to an Internet computer classroom are in a position to teach students valuable lifelong learning skills and strategies for becoming autonomous learners."

Understanding the development and exercise of learner autonomy in technology-rich language learning environments thus requires an analytical framework that integrates the psychological (individual), political (social) and technical dimensions of learner autonomy (Benson, 1997) while acknowledging the central role of CALL tools and artefacts as mediators of the language learning process. This paper proposes that cultural-historical activity theory can provide such a framework.

2 Assessing the potential of CALL for learner autonomy

If educational technology is linked to the renewed interest in learner autonomy, Benson argues that "claims made for the potential of new technologies in regard to autonomy need to be evaluated against empirical evidence of the realisation of this potential in practice" (Benson, 2001:141). Indeed, the relationship between CALL and learner autonomy is either discussed at a theoretical level – for example, Levy (1997) distinguishes between the tutor and tool roles of the computer and argues that the computer tool is more likely to foster the development and exercise of learner autonomy – or remains only a starting point on which design principles or decisions are based (e.g. Kaltenböck, 2001; Groß & Wolff, 2002).

The need for empirical evidence of the realisation of the potential of CALL is not restricted to the development and exercise of learner autonomy. In an attempt to address the lack of systematic procedures and valid methods for CALL evaluation, Chapelle (2001) argues that it should entail both judgemental and empirical analyses:

> "The judgemental analysis should examine characteristics of the software and task in terms of criteria drawn from research on SLA. The empirical analyses address the same criteria but through data gathered to reveal the details of CALL use and learning outcomes." (Chapelle, 2001: 54)

Chapelle (2001) outlines a set of six criteria for evaluating CALL tasks that provide the basis for the formulation of research questions, appropriate methodologies and data collection: language learning potential, learner fit, meaning focus, authenticity, positive impact and practicality. Interestingly, learner autonomy does not figure explicitly in Chapelle's model. Rather, it appears to be subsumed across a number of criteria such as authenticity, practicality, and positive impact. According to her own definition, positive impact emphasises the importance of metacognition in the language learning process. Her proposed questions and criteria in relation to the positive impact of CALL tasks mainly relate to the development of language learning strategies enabled by the task (Chapelle, 2001: 68). Positive impact can therefore be understood as partly referring to the effects of the CALL task on the development of learners' independence.

Chapelle's (2001) evaluation criteria and research questions do not seem to address the tension between the individual and the social highlighted at the beginning of this section. Her approach, however, goes beyond a mere evaluation of CALL artefacts and highlights overlapping themes between evaluation of materials or tasks, and empirical

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research (Chapelle, 2001: 157). CALL evaluation, as it is generally understood in the literature, is often equated with empirical research, even though they serve different purposes. While evaluation can be seen as a kind of empirical research, the latter has a wider agenda and aims to further our understanding of particular phenomena or to answer specific research questions. Evaluation of materials or tasks, on the other hand, is more restrictive in its scope as it is primarily directed towards making decisions in relation to the design features of a particular artefact or environment. Chapelle's redefinition of evaluation of materials, which "is seen as an argument about appropriateness for a particular purpose rather than as a categorical quality judgement" (Chapelle, 2001: 157) and her distinction between judgemental and empirical analyses thus constitute a useful starting point for examining the relationship between CALL and learner autonomy beyond evaluative purposes. Judgemental analyses would aim at assessing the potential of CALL tools and artefacts for the development and exercise of learner autonomy, while empirical analyses would focus on the process and the outcomes associated with the development of learner autonomy in context.

The developmental nature of learner autonomy suggests that such analyses, and in particular judgemental analyses, should be carried out at a macro level (e.g. at the level of a whole language learning programme) as well as at a micro level (e.g. at the level of a particular course or specific language task carried out over a period of time within the overall programme) rather than at the level of engagement or interaction with a particular CALL artefact.

An example of a broad judgemental analysis of the potential of CALL to promote the development and exercise of learner autonomy is given by Benson (2001). Keeping with his definition of learner autonomy as "the capacity to take control of one's learning" (Benson, 2001: 47), Benson assesses technology-based approaches to language learning in terms of the potential for the exercise of learner autonomy offered by behaviouristic, communicative and integrative CALL (Warschauer & Healy, 1998). From the beginning, CALL applications have been designed to give learners some level of control over some aspects of their language learning. While earlier applications mainly allowed control over the pace of learning and a limited choice over the mode of interaction with the program (e.g. instructional, practice or testing mode), more recent CALL applications, such as the use of Internet either as a resource for independent learning or as a tool for publication, offer much broader opportunities for the exercise of learner autonomy. Furthermore, by enhancing opportunities for collaborative language learning through the use of Computer Mediated Communication technologies, the Internet "also appears to facilitate learner control over interaction" (Benson, 2001: 139). Table 1 illustrates the correspondence between Warschauer and Healy's (1998) historical overview of CALL and Benson's (2001) analysis of the potential for learner autonomy afforded by CALL applications and technologies.

However, the relationship between the use of CALL and the development and exercise of learner autonomy is not as straightforward as Table 1 may suggest. For example, Benson (2001), following Kenning (1996) on concordancers, remarks that, "as in the case of self-access, it may be that learners require a degree of autonomy in advance in order to use new technologies effectively" (Benson, 2001: 140). Similar remarks have been made in the case of CMC and tandem learning: while Schwienhorst (1998) claims that Multi-users Virtual Reality (e.g. MOOS) has the potential to support the development

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Table 1. *CALL stages and the potential for learner autonomy*

Stage (Warschauer & Healy, 1998)	CALL applications and technologies	Potential for learner autonomy (Benson, 2001)
Behaviouristic CALL	Drills, vocabulary and grammar	Control over pace of learning; Control over mode (e.g. instruction, practice or testing);
Communicative CALL	Text reconstruction, games, simulations (problem-solving, cognitive engagement, spoken communication with peers)	Control over path taken
	Word-processors, desktop publishing packages, concordancers and databases	Control over text creation and interpretation
	(Computer tool used to facilitate linguistic processes involved in achieving non linguistic goals or to achieve linguistic goals that could not otherwise easily be achieved)	Control over process of learning; Development of metacognitive skills and metalinguistic awareness (i.e. cognitive and metacognitive autonomy)
Integrative CALL	Multimedia, hypermedia and interactive technologies promoting integration of skills (CD-ROMs)	Control over the selection of materials and over strategies of interpretation
	(Rich linguistic and non-linguistic input, new language presented through a variety of media, branching options)	
	Internet: email, on-line discussion, web authoring	Control over access
	Large collaborative projects (opportunities for collaborative learning)	Control over learning content; Control over interaction

of language use and learner autonomy in the case of tandem learning, Little (1996) argues that learner autonomy is a necessary condition if tandem learning is to be successful. Some CALL applications may therefore promote the development and the exercise of learner autonomy, provided that learners are already significantly autonomous.

The views expressed so far are the results of judgemental analyses based on experience, intuition or theoretical reasoning. They do not address the cultural and social context underpinning the use of these technologies. Few studies provide the empirical analyses that are called for by Benson (2001). Some authors examine the development of learner strategies in a computer supported language learning environment (e.g. Atlan, 2000), others look at CMC activities and focus on the potential for reflection on both language and the language learning process (e.g. Lamy & Goodfellow, 1999). However, few CALL researchers explicitly address the development of learner autonomy in technology-supported language learning environments, with perhaps the notable exception of Murray (1999).

This lack of empirical evidence seems to be at odds with the claims made by many

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developers or researchers in relation to the significance of learner autonomy as a guiding principle for the design of CALL tools and artefacts, and of technology-enhanced language learning environments. The intricate and multidimensional nature of learner autonomy and of its development certainly contributes to the complexity of potential studies in this area. Evaluating the potential of a CALL artefact or tool, whether specific or generic, for the development of learner autonomy requires an understanding of both the process and product of this development in a variety of contexts. It also requires a set of criteria or questions guiding judgemental and empirical analyses, and appropriate data collection and interpretation methods, which will provide a way of measuring the development of learner autonomy, either quantitatively or qualitatively. In the absence of either, evaluating the potential of CALL for learner autonomy against empirical evidence may well be an impossible task. Furthermore, current models for CALL evaluation (e.g. Chapelle, 2001; Hémard, 2003) tend to emphasise the individual dimension of language learning and generally focus on the use of discrete CALL tools or artefacts, if not on discrete elements of same (Levy, 1999: 99). Most of them aim at deriving a "quality judgement" (Chapelle, *op. cit.*), and thus do not provide an integrated framework for analysing both the process and the product of the development of learner autonomy. New paradigms are called for, which should offer guidelines to carry out adequate judgemental and empirical studies. The next sections will explore how cultural-historical activity theory can assist in providing such paradigms.

3 Activity Theory concepts and principles

Cultural-historical activity theory is a multidisciplinary field originating in Marxist philosophy and Vygotsky's cultural-historical psychology (see for instance, Chaiklin, Hedegaard & Jensen, 1999). In particular, it draws on Vygotsky's (1978) concepts of mediated action and on Leontiev's (1978) activity theory.

There are many approaches to activity theory as an object of study and to its use in trying to understand human and social practice. Two are particularly relevant to educational endeavours in general and to CALL in particular: activity-theoretical approaches to Human Computer Interaction (HCI) (see Nardi, 1996) and the use of activity theory principles to analyse organisations undergoing transformations as a result of technological innovations. The latter has been the focus of the research conducted by the Centre for Cultural Historical Activity Theory & Developmental Work Research (CHAT & DWR) led by Engeström at the University of Helsinki.

3.1 Engeström's Activity Theory model

Leontiev (1978) defined activity in terms of three constituents (subject, object and tools) operating on three different levels: collective activity, group or individual action, and automatic operation. An individual or group (the *subject*) carries out a number of *actions*, (or a chain of actions), that are directed towards an *object* (goal or motive). The important characteristic of group or individual actions is that they are goal-oriented: "actions are purposeful, and importantly, not automatic" (McCafferty *et al.*, 2001: 289). The collective activity is determined by its object or motive: similar actions can serve different activities if they are directed towards different goals. Actions become routinised and

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automatised, and thus become operations, when they cease to be goal-directed.

In carrying out an action, the subject is assisted by a set of tools (or mediating artefacts), which mediate the relationship between subject and object. Tools can be technical or psychological. They are culturally constructed and transmitted: artefacts embody the culture that created them and are the expression of cognitive forms developed within that culture (see for instance, the different functions embodied in scientific calculators used in different cultures), thus "carrying with [them] the history of the relationship" (Kuutti, 1996: 27). Tools and artefacts take part in the transformation of the object into an outcome, which can be desired or unexpected. They mediate the relationship between the subject (individual or team) and the object of the activity, thus transforming them, and empower the subject, whose actions can be enabled and enhanced by their use. However, they can also be limiting by obscuring some aspects of the object of the activity: a tool or artefact may restrict the interaction between subject and object "from the perspective of that particular tool or instrument only" (Kuutti, 1996: 27).

Engeström (1987) expanded Leontiev's model and defines the basic structure of an activity system in term of six constituents – object, subject, tools and artefacts, community, rules and division of labour – operating on the three levels identified by Leontiev (1978). The subject is not acting in isolation but is a part of a community, which comprises those participants sharing the same object. The relationship between the subject and the object is mediated not only by tools and artefacts but also by explicit and implicit rules and conventions. The relationship between the community and the object of the activity is in turn mediated by a division of labour, which encapsulates both the horizontal distribution of tasks between peers and the vertical distribution of power between participants. An activity is a systemic formation and mutual relationships exist between all its constituents, even though the triangular relationship subject – object – community forms the basis of any activity system (Kuutti, 1996: 27). Following Engeström (1987), activity systems are conventionally represented by 'triangles'.

Engeström's model goes beyond a mere description of the relationships between the different constituents of an activity system. Activity systems are multivoiced formations where different subjects, whether individual or team, bring their own histories and construct the object in different ways, through their status in the division of labour and their level of familiarity with the mediating tools available (Engeström, 1999). These different constructions of the object may be converging or conflicting and subjects may not be aware of the object of the activity until it has been transformed into an outcome. The awareness of the actual object of the collective activity is often gained through a retrospective analysis of the subject's own practice (Centre for CHAT & DWR). Consequently, the object is constantly in transition and under construction. The object can manifest itself in different forms for different participants at different times. Tools and objects are interchangeable during the activity: the participants' unfamiliarity with a tool results in a shift from tool to object and vice-versa (Hasu & Engeström, 2000).

Activity systems interact with others and evolve over a long period of time. They do not exist in isolation and the interaction between activity systems results in the internalisation, at the collective or individual levels, of external components or influences. This internalisation of external components creates disruptions and imbalances within the activity system. Breakdowns, tensions and internal contradictions are seen as source of development as the activity system as a whole works through these contradictions.

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Engeström (1987; see also Centre for CHAT & DWR) identified four levels of contradictions. Level 1 corresponds to primary inner contradictions within each constituent component of the central activity. Level 2 corresponds to secondary contradictions that emerge between constituents of the activity system following the importing of new elements into the existing system, which, for example, create conflicts between a new object and the existing tools and artefacts. Level 3 depicts a tertiary contradiction that "appears when a culturally more advanced object and motive is introduced into the activity" (Centre for CHAT & DRW), such as the introduction of a new teaching and learning curriculum which may be resisted by some elements of the old teaching and learning activity systems. Finally, level 4 relates to the quaternary contradictions emerging between "the changing central activity and its neighboring activities" (Centre for CHAT & DRW).

These contradictions result in the restructuring of the initial activity system through the construction and adoption of new solutions that may take the form of new rules and division of labour, but also of new objects and tools. This process is called externalisation (Engeström, 1999). Internalisation and externalisation occur in 'expansive cycles' (Engeström, 1999). Through externalisation, new knowledge is constructed, which is then internalised as the new activity system stabilises itself.

3.2 Example: modelling a language learning activity system

Engeström's model provides an analytical framework and a terminology (admittedly both quite complex at first) to describe a variety of activities as they unfold in practice. In particular, it is possible to use activity theory to model and to represent a particular language learning activity as seen from the perspective of different actors participating in the learning activity. For example, a close examination of the syllabus of a French module, delivered over a period of twelve weeks to approximately forty first year students in Dublin City Universisty (DCU), provides the basis for the following narrative and for its graphic representation given in Figure 1. Here, the module itself constitutes the activity system under study. This module is organised around the collective creation of a website directed towards French speaking students intending to come and study in DCU. Different sections of the website are to be realised by smaller teams cooperating with each other.

Motivated by the initial object of the language learning activity, in this case the construction of the website, the subjects (who can be individual students, teams, or even teachers) carry out chains of actions that are oriented towards the realisation of the website. These goal oriented actions may focus on language use, such as the creation of the information given by the site or the writing up of minutes of team meetings, or on the development and acquisition of transferable skills, such as information retrieval, basic HTML skills, or organisation of meetings, to mention but a few.

The realisation of actions by the subjects is mediated by a number of tools and artefacts. The latter may have been externally created and include, *inter alia*, French websites providing linguistic information on topics relevant to the students' chosen themes (e.g. accommodation, university facilities, student finances, entertainment, etc.), Irish sites providing content information, and a variety of reference materials such as dictionaries. As the activity unfolds, artefacts are also created by the subjects, such as written

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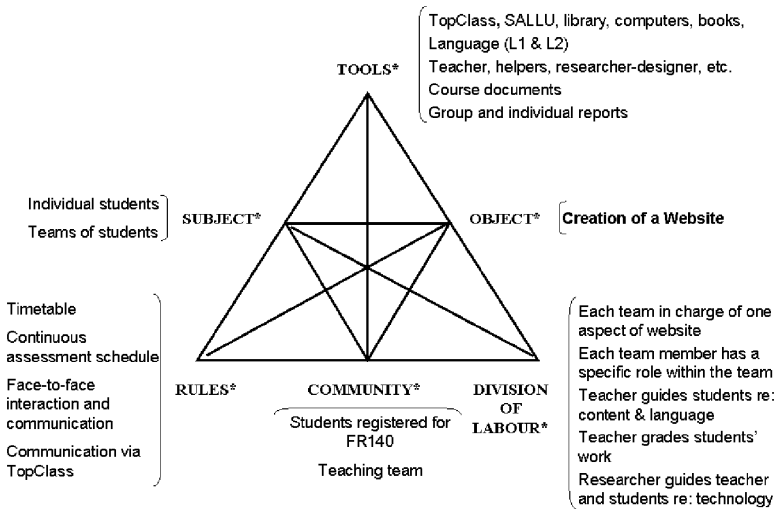


Fig. 1. A representation of a language learning activity system

or spoken texts (e.g. content for the website, reports, minutes, postings, oral presentations, etc.). Non-material tools can be of a cognitive or metacognitive nature, such as planning and intentions, organising, and decision-making, and include both the first and second languages. Material tools include technology, such as networked computers available in the self-access language unit (SALLU), a Virtual Learning Environment (i.e. TopClass), and generic software, such as Microsoft Office, email, or concordancing software (WordSmith Tools), which are all externally enabled by the university.

The individual subject belongs to a wider community comprising her class group and the teachers. The community's collective activity is mediated by the range of available tools and language learning artefacts previously outlined, in particular by communications tools provided by the VLE, and by a certain division of labour. The division of labour is horizontal, where a team of students collaborate and distribute the realisation of sub-tasks (e.g. research, between themselves, and also vertical. In that case, the teachers impose a certain way of completing the task and grade the students' performance. Finally, a number of rules and conventions, such as the assessment regulations and the requirement to use French to communicate, mediate the relationship between either the subject or the community and the object of the learning activity.

Through the realisation of the activity or actions, the object is transformed into an outcome, which can be measured in terms of language performance, transferable skills and learner autonomy. In other words, as students direct their actions towards the construction of the website, they develop and consolidate a range of skills and competencies that can be assessed. As the language learning activity unfolds, a number of influences, external pressures or internal contradictions, such as the participants' unfamiliarity with the technology, may momentarily disrupt the activity and change its object.

The representation of the language learning activity system developed so far is still essentially descriptive. It provides nevertheless a starting point to carry out judgemental and empirical analyses, which can address a variety of issues and research questions relevant to the investigation of the relationship between CALL and learner autonomy. The

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interweaving of individual and collaborative actions mediated by technology indeed offers a suitable context for such an investigation. It is necessary, however, to further explore the mediating role of tools and artefacts, and in particular that of Information Technology, from an activity-theoretical perspective.

3.3 Activities and the mediating role of information technology

Starting from an HCI research perspective, Kuutti (1996), argues that the relationship between activities and information technology is complex because "information technology can support and penetrates activities at all levels" (Kuutti, 1996: 34), i.e. at the operation, action and activity levels.

At the level of operations, information technology can allow the automation and substitution of human operations (e.g. calculations, spell checks, data manipulation and updating, document formatting, etc.). At the level of actions, "information technology can serve as a tool in manipulative and transformative actions directed to an object or to a part of it" (Kuutti, 1996: 34). Such tools may include word-processors and other editors, spreadsheets, presentation software, or drawing tools to mention but a few. At this level, "Information Technology can also help in actions that are directed toward sense making" (Kuutti, 1996: 34) and support "communicative actions between participants" (Kuutti, 1996: 35). The former class of technology may also include anything that will help participants to take part in the activity (email, computer conferencing, etc.) while the latter may include not only on-line resources but also courseware or training packages. Finally, Information Technology "can be the principal enabler for an activity" (Kuutti, 1996: 35) by either connecting the participants, for example via a network or platform, or by enabling participants' awareness of the object of the activity.

As remarked by Kuutti himself, this classification is not comprehensive, nor rigid, as the boundaries between the three levels of an activity are somewhat blurred and depend on the subject and object of real life activities and situations (Kuutti, 1996: 32). This hierarchical structure of activities assumes a degree of flexibility in relation to boundaries between collective activity, individual or group actions and routinised operations. This flexibility, according to Kuutti (1996: 32), makes it difficult to generalise what an activity is and what an action is. Indeed, actions that are repeated over time and practised within the activity may become operations, i.e. actions that have been routinised and automated. Conversely, a change in conditions may trigger an operation to reverse to the action level. Similarly, what constitutes an action from the perspective of a specific actor (e.g. project manager or teacher-designer) may be an activity for somebody else (e.g. programmer or student). Consequently, a certain amount of overlap may exist between the different levels and their associated supporting technologies, as a shift between the various constituents may occur during the different transformative stages of the activity.

The apparent flexibility of activity theory concepts and principles raises a number of epistemological and methodological issues and challenges. In particular, defining the unit of analysis entails delineating with precision the boundaries of an activity system. While activity theory stipulates that activity constitutes the minimal unit of analysis (Leontiev, 1978; Engeström, 1987; Cole & Engeström, 1993), it does not provide precise guidelines on how to define what actually constitutes this unit of analysis. In the

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example given in the previous section, the unit of analysis is defined as a complete module. It is however possible to divide this activity system into sub-activity systems corresponding to the 'sub-activities' in which different participating teams are engaged.

Other methodological and epistemological issues relate firstly to the notion of time and the need to analyse a learning activity across multiple timescales (Lemke, 2001), and secondly to the actual design of activity theory based research programmes, which usually adopt developmental research methods or formative experiments (Engeström, 1999: 35–36). Discussing these issues in depth would go far beyond the scope of this paper. Due to space limitations, the next section will only illustrate some of the directions enabled by activity-theoretical perspectives on the study of CALL and learner autonomy.

4 An activity-theoretical perspective on the study of CALL and learner autonomy

4.1 A multilevel approach to CALL and the development of learner autonomy

The supporting functions of IT identified by Kuutti (1996) illustrate the level of control that computers can support or even exercise at different levels of the activity. The correspondence between levels of activity, CALL and learner autonomy is illustrated by Table 2, which attempts to synthesise both Kuutti's classification and Benson's analysis summarised earlier in Table 1. The third column lists the types and levels of control potentially matching Kuutti's supporting function of IT and the last column proposes a classification of corresponding CALL technologies.

According to Kuutti (1996: 37), "by using activity theory, it is in principle possible to discuss issues belonging to different levels within an integrated framework". The categories of control identified in Table 2 suggest a correspondence between the three levels of activity and the three versions of autonomy discussed by Benson (1997) and briefly recalled in the introduction to this paper (i.e. technical, psychological and political autonomy). A multilevel approach to CALL and learner autonomy, along the lines suggested by Kuutti, thus provides an integrative framework, where both social and individual characteristics of learner autonomy can be taken into account.

As briefly discussed earlier in this article, Chapelle (2001: 52) proposes a set of principles, criteria and questions for evaluating CALL. The adoption of a multilevel activity theoretical approach to the study of CALL and learner autonomy leads to the modification of these principles and criteria. Chapelle's principles are expanded through a shift from language learning as the principle object of the language learning activity to language use and learner autonomy as motives for the overall activity. Language learning thus becomes the desired outcome of the activity. CALL-mediated tasks are now viewed as goal-oriented actions or chains of actions carried out by individuals or groups, and whose direction is given by the motive of the overall collective language learning activity. A set of questions guiding a judgemental analysis can now devised (see Table 3).

Where learner autonomy underpins the design and implementation of language learning environments mediated by technology, the above questions can inform the design and evaluation of such environments. For instance, they can focus the designer's attention on certain design features and on the appropriateness of the tools and artefacts, with

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Table 2. *A multilevel activity-theoretical classification of CALL tools and artefacts for learner autonomy*

Levels of Activity	Potential supporting role of IT (adapted from Kuutti, 1996: 36)	Potential level of control and criteria for learner autonomy	CALL tools and artifacts supporting and mediating language learning activity
Collective activity	Enabling the automation of a new routine or construction of a new tool Enabling something to become a common object Enabling the negotiation of new rules Enabling the formation of a new community Enabling the reorganisation of the division of labour Supporting learning and reflection with respect to the whole object and activity	*'Political' Autonomy* Control over the overall language learning environment Control over the common object of the language learning activity Control over the social structure of the language environment Control over the content of language learning Development of 'collective' metacognitive skills	Internet Hybrid systems Virtual Learning Environments and groupwares LAN CMC
Individual or group actions	Supporting transformative and manipulative actions; making an object manipulable Supporting communicative actions Supporting sense-making actions within an activity Making tools and procedures visible and comprehensible Making the set of rules visible and comprehensible Making the network of actors visible Making the work organisation visible and comprehensible	*'Psychological' Autonomy* Transparency of technologies Control over access Control over the selection of materials and over strategies of interpretation Control over path taken Control over interaction Development of metalinguistic awareness Control over the narrative of a program	Word-processors and editors, presentation software, spreadsheets, concordancers Email, computer conferencing Multimedia, courseware and training packages (CD-ROMs, DVDs, Web) integrating the four skills Games, simulations, text reconstruction Electronic resources (dictionaries, corpora, web resources, databases)
Routinised or automated operations	Automating routines and triggering predetermined responses Providing data about an object	*'Technical' Autonomy* Control over pace of learning Control over mode of learning (practice	Drills and practice, automated feedback Grammar and spellcheckers

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Table 2. (*Continued*)

	Embedding and imposing a certain set of rules	or testing)	Testing, submission of assignments
	Creating an implicit community by linking work tasks of several people together		Automated generation of teams or pairs
	Embedding and imposing a certain division of labour.		

Table 3. *Questions for the judgemental analysis of language learning activity systems*

Level of activity	Questions
Collective activity	1. Is there any opportunity for a collective reflection with respect to the objects of the language learning activity? Which component(s) of the activity system may support or prevent it? 2. Is there any opportunity for the negotiation and implementation of new rules, the reorganisation of the division of labour, the formation of a new community and the construction of a common object? Which component(s) of the activity system may support or prevent these? 3. Is there any opportunity for the creation and internalisation of new tools and procedures? Which component(s) of the activity system may support or prevent them?
Individual or group actions	4. Are the initial set of rules, division of labour, and range of tools and artefacts made visible and comprehensible to all participants? Which tools or artefacts potentially contribute to making these visible and comprehensible? Which components of the activity system prevent such a transparency? 5. What amount of support is given to communicative and sense-making actions? Which components of the activity system potentially support or prevent communicative and sense-making actions? 6. To what extent can learners control, manipulate, or transform language learning content and materials. Which components of the activity system enhance or constrain learners' control, manipulation and transformation of language?
Routinised operations	7. Where does the locus of control lie? Which tools and artefacts support the embedding and automation of routines and procedures? Which tools and artefacts impose a certain set of rules or a certain division of labour?

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respect to the object of the activity, made available to the community at the outset of the activity. More importantly, they can provide the basis for subsequent empirical analyses, whether quantitative or qualitative, focussing on the three levels of activity. At the collective activity level, for example, one may want to look for evidence of the negotiation of new rules, or of the creation and internalisation of new tools. In order to interpret the findings, however, and to subsequently derive a quality judgement (i.e. to evaluate) with respect to the different components of the activity system, it is necessary to gain a better understanding of the developmental process that will reveal itself through the realisation of the language learning activity. Engeström's (1987, 1999) notion of contradictions, which are seen as source of development, is an essential construct in such a perspective.

Within an activity theoretical perspective, CALL tools and artefacts, along with many others, mediate the language learning activity itself. As such, they are essential components of the language learning activity system and thus contribute to the transformation of both the environment and the subjects participating in the activity (see the concept of reverse action as a characteristic of tools introduced by Vygotsky, 1978). Following Engeström (1999), the introduction of new tools and artefacts, such as CALL, in the language learning activity is likely to result in contradictions or tensions within and between elements of the activity system, and with other neighbouring activities. Identifying not only the contradictions that may directly affect the object and outcome of the language learning activity but also the way they have been resolved (or not), may thus further our understanding of the development and exercise of learner autonomy in context: the resolution of contradictions through, for example, the creation and subsequent internalisation of new tools or rules will provide some evidence of the development of learner autonomy, both at the collective and individual levels. The next section will illustrate some of the principles of activity theory in the case of the French module represented in section 3.2.

4.2 Application of activity theory: examples drawn from a judgemental analysis

The kind of activity-theoretical judgemental analysis proposed here does not constitute an evaluation of the outcomes of a prior instructional design phase. Its main purpose is to enable the researcher to identify areas or questions requiring further analysis. A secondary purpose of such a judgemental analysis may be to alert the designer or teacher to potential obstacles or contradictions that may reveal themselves as the language learning activity unfolds in practice.

An activity-theoretical judgemental analysis of CALL and learner autonomy focuses primarily on the tools and artefacts mediating the language learning activity and on the potential role of other mediators such as rules and division of labour. It also attempts to identify potential contradictions that may arise in the course of the realisation of the activity. Due to space limitations however, it is not possible to account for a comprehensive judgemental analysis. Therefore, the following discussion, centred around some of the questions given in Table 3, and located in the context of the French module described earlier, should only be seen as an illustration of activity-theoretical concepts and principles.

From a course designer perspective, the tools and artefacts mediating the language learning activity stimulated by the French module under study potentially enable a

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'political' autonomy, which entails a collective reflection with respect to the creation of the website as an object of the language learning activity, the negotiation and implementation of new rules, a re-organisation of the division of labour, and the creation of new tools and procedures. For instance, group and individual reports on work in progress provide individual students or teams with opportunities to appraise, question and criticise what they perceive as the object of the language learning activity and, consequently, to influence through their actions, and through the goals they set for themselves, the direction of the overall language learning activity. Technologies available through the VLE, such as the discussion lists, also potentially support collective reflection, as they give teachers and students the opportunity to initiate and to engage in a collective reflection at any time and outside the boundaries of the physical classroom.

In relation to the negotiation and implementation of new explicit rules, fewer opportunities may exist as a number of rules (e.g. assessment procedures and regulations) and a vertical division of labour (e.g. the teacher grades the students), which are imposed from the outside, implicitly constrain the level of opportunities for negotiation and re-organisation. However, group work allows for the negotiation of implicit rules and for a certain reorganisation of the division of labour: the allocation of roles within a team (e.g. group leader, secretary, webmaster, etc.), and the distribution of work between its members (e.g. research on and production of specific aspects of the chosen theme) constitute examples of a possible re-organisation of the division of labour. Similarly, new implicit rules governing communicative actions between participants, such as the adoption of an acceptable register, the use of abbreviations or 'smileys' in postings to the discussion list, and the content of messages, may be implemented.

Finally, the creation and internalisation of new tools and procedures relate to the notion of expansive cycles introduced by Engeström (1999a). New tools can be seen as outcomes of the activity as it unfolds (externalisation), that are then adopted as tools mediating subsequent actions (internalisation). Two sets of tools are particularly relevant here: the target language itself used throughout the module (i.e. the metalanguage used to talk about all aspects of the language learning activity itself and the lexical and grammatical structures associated with the chosen themes), and the range of metacognitive and transferable skills that may be constructed by individuals and adopted by the community during the course of the activity.

These opportunities, however, need to be transformed into effective actions to be realised. In that sense, they are *affordances*, as defined by Ryder and Wilson (1996) following Gibson's work (1979) on perception. If the language learning environment resulting from the instructional design process *affords* the development and exercise of learner autonomy at a collective level, its properties and capacities must be perceived by the participants for the affordances to become "effectivities" (Ryder & Wilson, *op. cit.*). Moreover, the participants, be they teacher or students, must have the *will* to act. In particular, the teacher's willingness and skills in enabling and promoting a collective reflection, a negotiation of rules, and a re-organisation of the division of labour will play a significant role, as will her own autonomy. In other words, the social and cultural structures that characterise the learning environment will shape and constrain the opportunities enabled by the various technologies available.

In order for participants to perceive the properties and the capacities of the learning environment – and therefore to develop and exercise a 'psychological' autonomy – these

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must be made visible and comprehensible at the level of individual or group actions. The course documents and the explanations provided in class by the teacher aim to make the rules, division of labour and range of tools and artefacts visible and comprehensible to all participants. For instance, a series of *Travaux Pratiques* (tutorials) documents support the sessions in the computer laboratory by giving detailed instructions on how to use various applications. Hard copies of these documents are given to students and electronic versions (HTML) are accessible via the coursework area in TopClass. These documents, however, are all written in French and thus may not be fully comprehensible to some students. At the collective activity level, the target language is seen as a tool enabling the creation and internalisation of new tools and procedures. At the level of individual actions, however, the target language can potentially prevent access to some aspects of the same activity.

The construction of the website involves the manipulation and transformation of language structures and content, and is mediated by a wide range of tools: browser and search engines to search for information and to create a corpus, use of shared directories to save and to access files, database to store and to manipulate information on texts, concordancing software to explore and analyse the corpus, wordprocessor to produce and correct written texts, and HTML to create the website. Each of these tools requires a level of familiarity on the part of the user. Also technical problems or software limitations may constrain the level of manipulation and transformation afforded by the software. As a result, the tool itself may temporarily become the object of the activity. Tools and artefacts, such as the target language and unfamiliar or unstable technologies, which can be enabling at the collective level, can therefore prevent visibility, comprehensibility, and manipulative and transformative actions.

At the operation level, the embedding and automation of routines and procedures are supported in different ways. Some mediating artefacts embed and impose a certain set of rules (e.g. required format and content of reports) and division of labour (e.g. 'who does what and when'). These artefacts, however, aim to mediate the actions carried out by learners until they become automated and routinised. In other words, they support the internalisation of routines and procedures that will contribute to greater learner autonomy and autonomous language use at the psychological level. At the other end of the spectrum, some of the technologies enabled by the university, and/or by the wider community, not only embed and automate a range of routines and procedures, they also assume total control over them. For example, the transfer of information between participants via normal email or TopClass discussion list, or the distribution of course documents via the TopClass coursework area are automated from 'the outside'. In between, some technologies allow a certain distribution of control between the machine and the user. The amount of control applied by the learner will depend on her will or intention to exercise it (see for example the autocorrect option in most word processing applications).

5 Conclusion

Space limitations did not allow for the in-depth exploration of methodological issues and procedures that is necessary to fully demonstrate the applications of cultural-historical activity theory in practice. In particular, it was not possible to include some

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empirical analysis. Nevertheless, the judgemental analysis reported above highlights some of the characteristics and properties of a language learning activity system with respect to its potential for the development and exercise of learner autonomy and of language use. It also provided some insights into potential internal contradictions that may reveal themselves in the course of the activity, by highlighting the dynamics between the three different levels. For instance, it was suggested that some tools, which provide affordances for the development of learner autonomy and language use at the level of the collective activity, may actually prevent its development and exercise at the level of individual or group actions. Similarly, while the repetition of actions may lead to their operationalisation and thus to an increased autonomy in terms of learning or language use, the embedding and automation of some routines or procedures may result in a decreased level of control on the part of the learners. Carefully designed formative experiments are thus required, that will attempt to describe, analyse and interpret the tensions, breakdowns, contradictions or disturbances preventing the object of the activity to be transformed in desired outcomes. Findings resulting from developmental research programmes may then enable the formulation of evaluative criteria and methodologies appropriate to specific social and cultural contexts.

Activity theory is not a method in itself, nor a theory in the usual sense of the term as it does not systematically allow us to predict phenomena, processes or outcomes. It does however provide a terminology and an analytical framework that help us to make sense of human and social practice in specific contexts, and more specifically where technological mediation plays a significant role.

While this paper has explicitly focused on the development and exercise of learner autonomy in the context of technology-rich learning environments, the value of activity theory concepts and principles for CALL research is only starting to be recognised. The complexity of its underpinning philosophical and epistemological assumptions, which at times translates into complex and somewhat obscure terminology and arguments, may have deterred many from engaging in activity-theoretical research projects. Yet, activity theory has entered the domain of educational psychology and technology. It is only a matter of time before CALL researchers and designers fully benefit from them.

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References

Atlan, J. (2000) L'utilisation des stratégies d'apprentissage d'une langue dans un environnement des TICE. *Apprentissage des Langues et Systèmes d'Information et de Communication*, **3**(1): 109–123. http://alsic.univ-fcomte.fr/ retrieved 11-06-2000.

Benson, P. (1997) The philosophy and politics of learner autonomy. In: Benson, P. and Voller, P. (eds.), *Autonomy and Independence in Language Learning*. London: Addison Wesley Longman Ltd, 18–34.

Benson, P. and Voller, P. (1997) Introduction. In: Benson, P. and Voller, P. (eds.), *Autonomy and*

https://doi.org/10.1017/S0958344004000928 Published online by Cambridge University Press

Independence in Language Learning. London: Addison Wesley Longman Ltd, 1–12.
Benson, P. (2001) *Teaching and Researching Autonomy in Language Learning*. Harlow, Essex: Longman.
Centre for Cultural-Historical Activity Theory and Developmental Work Research, University of Helsinki. http://www.edu.helsinki.fi/activity/ retrieved 03-11-2003.
Chaiklin, S., Hedegaard, M. and Jensen, U. J. (eds.) (1999) *Activity Theory and Social Practice*. Aarhus: Aarhus University Press.
Chapelle, C. (2001) *Computer Applications in Second Language Acquisition, Foundations for teaching, testing and research*. Cambridge: Cambridge University Press.
Cole, M. and Engeström, Y. (1993) A cultural-historical approach to distributed cognition. In: Salomon, G. (ed.), *Distributed Cognition: Psychological and educational considerations*. Cambridge: Cambridge University Press, 1–46.
Dickinson, L. (1987) *Self-instruction in Language Learning*. Cambridge: Cambridge University Press.
Engeström, Y. (1987) *Learning by Expanding. An activity-theoretical approach to developmental research*. Helsinki: Orienta-Konsultit.
Engeström, Y. (1999) Activity theory and transformation. In: Engeström Y., Miettinen, R. and Punamäki, R.-L. (eds.), *Perspectives on Activity Theory*. Cambridge: Cambridge University Press, 19–38.
Furstenberg, G. (1993) *À la rencontre de Philippe* (videodisc program for Macintosh environment). New Haven, CT: Yale University Press.
Gibson J. J. (1979), *The Ecological Approach to Visual Perception*, Boston: Houghton Mifflin.
Groß, A. and Wolff, D. (2001) A multimedia tool to develop learner autonomy. *Computer Assisted Language Learning*, **14**(3–4): 233–249.
Hasu, M. and Engeström, Y. (1999) Measurement in Action: An Activity-Theoretical Perspective on Producer-User Interaction. http://www.edu.helsinki.fi/activity/pdfs/hasueng.pdf retrieved 29-05-2002.
Holec, H. (1981) *Autonomy in Foreign Language Learning*. Oxford: Pergamon.
Kaltenböck, G. (2001) Learner autonomy: a guiding principle in designing a CD-ROM for intonation practice. *ReCALL*, **13**(2): 179–190.
Kenning, M.-M. (1996) IT and autonomy. In: Broady, E. and Kenning, M.-M. (eds.), *Promoting learner autonomy in university language teaching*. London: Association for French Language Studies/ CILT, 121–138.
Kuutti, K. (1996) Activity Theory as a potential framework for Human-Computer Interaction research. In: Nardi, B. (ed.), *Context and Consciousness: Activity Theory and Human-Computer Interaction*. Cambridge, MA: The MIT Press, 17–44.
Lamy, M.-N. and Goodfellow, R. (1999) "Reflective conversation" in the virtual classroom. *Language Learning Technology*, **2**(2): 43–46.
Lemke, J. L. (2001) The long and the short of it: Comments on multiple timescale studies of human activity. *Journal of the Learning Sciences*, **10**(1&2): 17–26.
Leontiev, A. N. (1978) *Activity, Consciousness and Personality*. Englewood Cliffs, NJ: Prentice Hall.
Levy, M. (1997) *Computer-Assisted Language Learning – Context and conceptualisation*. Oxford: Oxford University Press.
Little, D. (1990) Autonomy in language learning. Some theoretical and practical applications. In: Gathercole (ed.), *Autonomy in Language learning*. London: CILT, 7–15.
Little, D. (1991) *Learner Autonomy 1: Definitions, Issues and Problems*. Dublin: Authentik.
Little, D. (1994) Learner autonomy: A theoretical construct and its practical application. *Die Neueren Sprachen*, **93**(5): 430–442.
Little, D. (1996) Learner autonomy and learner counselling. In: Little, D. and Brammerts, H.

https://doi.org/10.1017/S0958344004000928 Published online by Cambridge University Press

(eds.), *A Guide to Language Learning in Tandem via the Internet*. CLCS Occasional Paper No 46, Dublin: Trinity College, 23–34.

Little, D. and Dam, L. (1998) Learner autonomy: what and why? *The Language Teacher Online* 22.10. http://langue.hyper.chubu.ac.jp/jalt/pub/tlt/98/oct/littledam.html retrieved 25/04/2002.

McCafferty, S., Roebuck, R. and Wayland, R. (2001) Activity Theory and the incidental learning of second-language vocabulary. *Language Awareness*, **10**(4): 289–294.

Mozzon-McPherson, M. and Vismans, R. (eds.) (2001) *Beyond Language Teaching, Towards Language Advising*. London: The Centre for Information on Language Teaching and Research (CILT).

Murray, G. L. (1999) Autonomy and language learning in a simulated environment. *System*, **27**: 295–308.

Nardi, B. (ed.) (1996) *Context and Consciousness: Activity Theory and Human-Computer Interaction*. Cambridge, MA: MIT Press.

Ryder M. and Wilson B. (1996), Affordances and constraints of the Internet for learning in instruction. http://carbon.cudenver.edu/~mryder/aect_96.html retrieved 20-11-2003.

Schwienhorst, K. (1998) The 'third place' – virtual reality applications for second language learning. *ReCALL*, **10**(1): 118–126.

Shetzer, H. and Warschauer, M. (2000) An electronic literacy approach to network-based language learning. In: Warschauer, M. and Kern, R. (eds.), *Network-based Language Teaching: Concepts and Practice*. Cambridge: Cambridge University Press, 171–185.

Vygotsky, L. S. (1978) *Mind in Society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Vygotsky, L. (1986) *Thought and Language*, revised and edited by A. Kozulin. Cambridge, MA : MIT Press.

Warschauer, M. and Healy, D. (1998) Computers and language learning: an overview. *Language Teaching*, **31**: 57–71. http://www.gse.uci.edu/markw/overview.html retrieved 14-02-03.

https://doi.org/10.1017/S0958344004000928 Published online by Cambridge University Press