A triangular approach to motivation in Computer Assisted Autonomous Language Learning (CAALL)

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Abstract

This study was carried out in a language centre, in French higher education. Teachers and researchers had contrived a pedagogical system labeled guided autonomy which combined class attendance in groups and self-study in the self-study room. This kind of autonomous and technologically enhanced learning system will be referred to as CAALL (Computer Assisted Autonomous Language Learning) in this paper. To investigate and reflect critically on the students' practices in CAALL, it was decided to carry out an extensive triangular study, cross-checking different data (Raby, 2003, 2005). The data pertained to what students did (physical behaviors while working), and to how they felt about it (verbal behaviors in the form of journals). Six students volunteered to take part in that experience. They were observed six times consecutively while working autonomously. In addition, we analyzed the journals in which they wrote about their feelings in connection with the CAALL system. From the students' observations, three strategic models emerged (epistemic, procedural and mixed). From the journal analyses, different motivational attitudes appeared, ranging from enthusiastic appraisal to stark rejection. One unexpected result yielded by the triangular approach was the importance of internal factors (the learners' characteristics) versus external factors (the learners' environment) in the process of appropriation of the new learning system.

Keywords: CALL, learning strategies, autonomous learning, motivation, triangulation

1 Introduction

This research was carried out in a university language centre, in France, by an interdisciplinary team using the theoretical constructs of educational cognitive ergonomics (Raby, 2005) and L2 motivation (Dörnyei, 2003). The team involved specialists in EFL, statistics, cognitive psychology, social psychology, and educational science. The purpose of this empirical research was to find out how students gradually master, or fail to master ,Computer Assisted Autonomous Language Learning (CAALL).

The research question was: Is a CAALL system a motivating learning environment? The answer required a conative social/cognitive/affective analysis and a research procedure taking into account those three dimensions. Therefore, the research was grounded in *triangulation*, a qualitative approach which recommends integrating different theories, methodologies and data sets, to try to overcome the biases that spring from one point of view only, i.e. one researcher, one theory, one method or one *datum*. The first part of this paper will describe the research setting. The second part will focus on the triangulation theory, presenting the cognitive and motivational frameworks supporting our empirical study. The third part will present a triangular interpretation of the data, in order to examine the motivational patterns generated by the CAALL environment.

2 The research context

In the university where the research took place, the students could study Law, Political Science, Economics, and Social Sciences, and most departments delivered courses in English for Special Purposes (ESP). It meant that the learners mainly studied written English and had little opportunity to do communicative English and could rarely take a second language. As a consequence, in the 1990s, a language centre was set up to cater for the learners' diverse needs

2.1 The research setting and equipment

The language centre is an independent building with six language classrooms, two rooms equipped with a language laboratory and one self-study room, divided into two parts. One part is devoted to electronic equipment (fifteen computers, eleven TV sets and video recorders). In the second part of the room, the learners find the available printed and written material (course-books and exercise-books, pedagogical guides, newspapers, periodicals, dictionaries, etc.), and also electronic resources (videocassettes, CD-ROMs and the Internet).

2.2 The pedagogical system

There are five permanent language teachers in the centre: two English teachers, one German, one Spanish, and one Italian teacher, plus ten part-time teachers. This team has adopted the pedagogical system of *guided autonomy*, inspired by theories on autonomous and self-regulated learning (Benson & Voller, 1997; Benson, 2001; Boackerts, 1999; Little, 1994). The concept of 'guidance' refers to the role played by the teachers who act as tutors during the face-to-face sessions.

  In collaboration with their tutor, the students must develop a specific project, such as preparing for a foreign certification such as the TOEFL, or the Cambridge Certificates. They can use the different media available. Once a week, one tutor regularly meets the same group of learners during guided sessions in which the teacher checks attendance and helps the learners with their work. In addition to these guided sessions, the learners must complete twenty-three self-study sessions on their own, in the self-study room. The sessions normally take place once a week, but students can organize these sessions

according to their schedules, provided that they complete twenty-three sessions in all. Every three weeks, native students enrolled at the university are present to help out during the self-study sessions. When the learners come to the self-study room, they are greeted by a member of the administrative staff who asks them to fill in a grid, listing the resources they use and the type of work they plan to do. A printed pedagogical guide to autonomous learning explains to them how to make use of the resources available, and of the electronic equipment. It also encourages them to ask the tutors for help. Three times a year, the tutors have an individual interview in the target language with each member of their group, to find out how the individual students feel about their progress and their project, and to advise them. Finally, the learners are also asked to keep a journal of their autonomous learning experiences.

3 Triangulation: concepts and practice

3.1 Introducing triangulation

Triangulation is characteristic of qualitative research conducted in natural settings (Gable, 1994; O'Malley & Valdez Pierce, 1996; Maxwell, 1996). Qualitative methods were originally developed by field anthropologists, sociologists, or ecologists, concerned with studying human behaviour as it normally occurs, with as little intervention as possible on the part of the researcher. In triangulation, the structured and overlapping use of multiple theories, multiple research methods, multiple researchers and/or multiple data sources is aimed at three main goals. First, to overcome the biases that spring from a single viewpoint; secondly to account for the observed learning situation holistically, taking into account cognitive, affective, and social factors; thirdly, to obtain confirmation of findings through the convergence of different perspectives. In the context of naturalistic educational settings such as CAALL, triangulation seeks to highlight unexpected elements, and to arrive at a deeper and more complex understanding of the language learning context. To account for the process of task redefinition in CAALL, two main theoretical frameworks are required. A cognitive framework, combining individual (Piaget) and social (Vygotsky) constructs, is necessary to account for the emergence of learning strategies and a socio-affective framework (Dörnyei, 2001; 2003) is necessary to account for the way in which individual or social factors influence the students' motivation.

3.2 Combining cognitive theoretical constructs

3.2.1 Redefinition of the task: a cognitive ergonomic construct
(Leplat & Hoc, 1983; Leplat, 1997, 2000)

In ergonomics, a *task* is what is planned or expected; an *activity*, what actually goes on. Leplat and Hoc, two French ergonomists, devised a *task/activity* construct which traces the successive transformations of the task by different participants, as it is actually carried out. This dynamic model is called *Task Redefinition* (TR). Drawing on Leplat's constructs, we have studied TR in different CALL situations (Raby, 2005; Raby, Baillé, Bressoux, & Chapelle, 2003).

In CAALL, the work situation associates a language learning *task* and a *learner*, in

two *specific conditions*: 'autonomous work' and a 'technological setting'. We believe that in such situations, the Task Redefinition process is even more important, because the task design is distributed among the teachers, the material designers, and the students themselves, who are not just simple performers of an *expected* or *prescribed* task. Two theoretical constructs will serve to elucidate the learning process. Piaget's model of scheme development will illuminate the individual process while Vytgosky's activity theory will highlight the social process (Vytgotsky, 1962, 1978).

3.2.2 Piaget's dynamic model of 'scheme' development (Anderson, 2001)

Piaget's *scheme theory* served as our conceptual framework for the consideration of individual cognitive aspects of the learning process. According to Piaget, from early childhood on, the same discovery pattern is repeated in more and more complex situations. Faced with a new situation, learners find themselves in a stage of *disequilibrium*. New demands incite them to develop adaptive procedures, using or transforming the environment so that they can apply pre-existing structures or schemes to it. This second stage is called *assimilation*. Gradually, existing structures evolve into a new learning scheme, which takes into account the new traits of the learning context. This third stage is called *accommodation* and leads to a mental state of equilibrium.

Before starting the language centre's guided autonomy course, the students had no experience of CAALL. This study looks at the way in which they developed, or failed to develop, new learning schemes. What representation of the new learning scheme may be extracted from the journals they kept? To what extent did they manage to reach the accommodation stage?

3.2.3 Vygotsky's socio-cognitive Activity Theory (Vygotsky, 1962, 1978; Leontiev, 1981; Lantolf & Appel, 1994; Engeström, 1999; Blin, 2004)

Vygotsky and his followers built up a theory to account for the development of children's autonomy. Lev Vygotsky sees collaborative action as being shaped in childhood when the convergence of speech and practical activity occurs and entails the instrumental use of social speech. It has to be hypothesized from the subjects' "behaviours of discourse".

Initially, children do not exert much control on their environment. At the stage of *other-regulation*, they are able to carry out certain tasks, thanks to the scaffolding help provided by a mentor or a peer. Next, children begin to assimilate planning, controlling and evaluative strategies, until they reach the *self-regulation* stage which involves meta-cognitive processes such as reflexive thinking. Self-regulation cannot be observed directly since it is a mental process, it has to be extracted or hypothesised from the subjects. Therefore, researchers need to resort to observations which can only operate at the level of a specific task, not at the level of a general linguistic program. The level of the task corresponds to *action* level in activity theory such as that described by Engeström (1987). At the action level a specific goal, such as understanding a text, directs the students' actions and may be segmented into subgoals, such as skimming or scanning the text. Goals are not stable because individuals – being active participants in tasks – are likely to modify, postpone or abandon their goals altogether; which is why we need a dynamic model, such as task redefinition, to account for this instability. Students' actions can also be broken up into the successive executive or control

procedures necessary to carry out a task. These actions always involve interaction with other members of / actors in the learning community; hence the development of socio-constructivist approaches in the educational field.

Vygotsky also accounts for the social way in which individuals create or manipulate tools (artefacts or symbolical systems like languages) in order to carry out their actions. In the case of computer-assisted language learning, the technological tools serve as mediators between the target language and culture and the learner. As Warschauer puts it;

'What is thus significant about various tools-such as the computers writing implements, or language itself-is not their abstract properties but rather how they fundamentally transform human action.' (Warschauer, 2005: 42)

In the first part of this study, the pedagogical goal imposed on the students was to prepare autonomously for a language examination, and the task under scrutiny was a comprehension task. It involved subgoals such as scanning or skimming the text, identifying and understanding the lexicon or idiomatic patterns, focussing on discourse patterns, practising to get used to the examination format, etc. While observing six students at work on their comprehension task, the researchers recorded their work, and the notes they took. This led them to develop models of task redefinition which were interpreted in the light of Piaget's and Vygotsky's theories.

3.3 Motivation in CAALL

Drawing on Dörnyei's dynamic model (Dornyei, 2001: 84-100) we propose the following definition of motivation in CAALL:

Motivation for language learning in autonomous, technologically enhanced contexts can be defined as the dynamic and changing mental state that generates a desire to:
- *acquire a foreign language,*
- *take and keep the initiative for work,*
- *maintain one's effort until the work is completed,*
- *regulate and evaluate ones' work through interactions with electronic tools and interactions with peers or tutors.*
- *renew the learning experience*

The motivational process is achieved only if these five conditions are fulfilled.

Motivation is not too difficult to describe, since it offers strong behavioural indicators; but it has proved much more difficult to account for, for example, why are people (de)motivated for a specific task or in a specific context. Factors influencing motivation are usually divided into two main categories: internal factors (involving learner characteristics), and external factors (involving the learning environment, including the teacher, the task, the material used, evaluation procedures, etc.). We analysed the students' journals to identify the internal and external factors which tend to initiate and sustain, or undermine motivation. Among the numerous theories and constructs which claim to analyse and explain motivation, we selected those which were relevant to the CAALL contexts and which were likely to be operationalised in the empirical study.

3.3.1 Internal factors

Integrative versus instrumental motivation

Gardner's precursory work and recent models (Gardner, 1985) are particularly relevant to the autonomous element in CAALL. According to this theory, learners who are *integratively* motivated (who follow personal goals and enjoy socializing) are more motivated and in a more permanent and successful way than learners who are *instrumentally* motivated (whose motivation responds to environmental demands). Integrative learners are those who like the language for itself while instrumental learners like to please their parents or their teachers.

Self-efficacy beliefs

In Bandura's (1993, 1997) *self-efficacy* theory, our perception of our ability to achieve a certain level of performance determines our ability to motivate ourselves to act. Individuals with a high sense of self-efficacy see difficult tasks or learning contexts as challenges which can be mastered, rather than as obstacles or threats. They maintain a strong commitment to their goals, even in the face of failure. In contrast, individuals with low self-efficacy shy away from difficult tasks, which they consider as threats because they are convinced they will not be able to meet the challenge. The present study seeks to find out to what extent the necessity to cope with three different domains (L2 learning, technical mastery of the computer, and self-regulated work) raised or lowered the students' feeling of self-efficacy.

Action control

Action control refers to the capacity to self-regulate one's actions (Kuhl, 1987; Boakert, 1999; Benson, 2001). Action control may involve cognitive or affective factors; it contributes to the appraisal process. If students feel they have a capacity to regulate a task efficiently, they will be more likely to sustain their effort. Little empirical research has been devoted to action control in L2 learning. While studying the students' journals, we looked for self-regulatory strategies as a sign that the students had found ways of enhancing, scaffolding or protecting specific language learning actions.

Attribution theory

Weiner's attribution theory (1992) investigates the *causal factor* in motivation. The way in which we attribute our successes or failures, either to ourselves or to situational demands, directly influences our perceived self-efficacy. *Internal attributors* – people who tend to lay the responsibility on themselves rather than on others – are usually more motivated and more efficient than *external attributors*, who tend to blame their environment. Usually, learners with high perceived self-efficacy attribute their failures to insufficient effort or deficient knowledge or skills which are acquirable, while low self-efficacy learners attribute them to low aptitudes or abilities which cannot be acquired. Weiner hypothesises that the most autonomous students are internal attributors.

3.3.2 External factors

The technological factor as a "motivating" factor

The relationship between technology and L2 motivation in language learning somehow

appears to be taken for granted: Information and Communication Technologies (ICT) favour motivation. For a critical view of these questions, see Chambers and Davies (2001), Warschauer (2005), Negretti (1999) and Chapelle (2003). Looking at the ICT literature (Egbert, 2005) we find the following claims: the computer provides the students with the necessary resources to achieve the task and to regulate it on-line (cognitive or linguistic tools, on-line dictionaries, spelling correctors, data banks); the hyper-media representation of knowledge makes it possible for the students to carry out different treatments involving a variety of procedures which enhance the learning process. Some authors claim that thanks to its fast treatment speed and great storage capacities ICT improves the cognitive capacities of the students (Myata & Norman, 1986). We tried to test these assertions against the students' appraisal of their language learning tools.

The teacher factor

Usually, in CAALL, teachers act collectively and have a high perception of the instructional efficacy of the learning environment, which leads them to set challenging goals for their teams and learners (Borges & Raby, 2001; Brodin, 2002) and design constructivist, communicative or pragmatic learning systems. The teachers in this study shared this teaching philosophy. However, they were primarily expected to prepare their students for external examinations such as the TOEFL, the TOEIC, or the Cambridge First Certificate which did not actually stimulate task-based or communicative teaching designs. The question was: Would the students be aware of that cognitive dissonance (Aronson, 1997)? Would it affect their own confidence in their tutors and more generally in the learning system? Did they see this limited contact with their teacher as a source of freedom and autonomy, or as a source of frustration – a lack of guidance and help?

The peer factor: vicarious learning

Bandura (1997) insists on the social dimension of the motivational process, particularly in academic settings. Seeing learners similar to themselves succeed by sustained effort increases the observers' feeling that they are also endowed with the capacity to master challenging tasks. Competent models not only provide a feeling of confidence, they also transmit knowledge and teach effective skills, procedures, strategies and rules for managing classroom demands. By the same token, observing others fail, despite sustained work, decreases the observers' confidence in their own capacity to achieve the same goals. In guided autonomy, students were encouraged to collaborate with their peers. Since they worked side by side, they had the opportunity of improving vicariously. Did they? Why or why not?

The task factor

Task models belong to *situated* or *local* models of motivation, which constitute the current trend of L2 motivation research today. "Interest in the motivational basis of language learning tasks can be seen as the culmination of the situated approach in L2 motivational research" (Dörnyei, 2003: 14). It is also dynamic and temporal, because it highlights the three stages of the motivational process: before, during, and after the task. Due to space limitations, it is not possible to account for the overall process here;

therefore, the following analysis of the students' journals – centered on their appraisal of the learning system – should be seen as a contribution to a model of motivation in CAALL, rather than a comprehensive account of the motivational process.

3.4 Summary of the theoretical triangulation

In order to account for the Task Redefinition process, two different types of constructs were combined. Cognitive constructs served to highlight learning patterns, while motivational constructs served to document the affective and social dimensions of the learning process. Each construct involved different sets of data: the student's physical behavior while at work, their linguistic productions, and their journals. Cross-checking these data enabled us to gradually disclose the motivational process.

3.5 The data cross-checking method

The cross-checking method is a form of data triangulation applied to CAALL settings (Raby, 2003, 2005). The researcher seeks to avoid just adding up different data, s/he tries to confront and tentatively integrate the different data in a research procedure which gradually encompasses the different aspects of the phenomena under scrutiny. Triangulation also recommends associating different research methodologies, quantitative or qualitative depending on the objectives of the research.

3.5.1 Looking for learning strategies

This part of our study is fully presented in Raby *et al* (2003); we will summarize the procedure and results here, to give an idea of how the cross-checking method works, through successive data comparisons, starting with behavioural analysis, and ending with the analysis of student journals.

Participants

Six learners of English, from the same guided autonomy class, preparing for the Cambridge First Certificate Examination, volunteered to participate in the experiment. One may wonder why the number of participants is so limited. The reason is that qualitative research does not seek to establish scientific rules, through the use of experimental procedures; its aim is to arrive at a fine-grained comprehension of the phenomenon under scrutiny which requires the close examination of a limited sample. In other words, the diversity of the data collected compensates for the limited number of participants. This study, for instance, is based on video recordings of the students during the working sessions, analysis of the notes they had taken, of their linguistic productions and of the journals they kept.

The students were all in their second year of study. Three of them were reading Political Science, three were studying Law. In one-hour self-study sessions, the students were allowed to work at their own pace. They were observed six times, a total of 36 observations. After each session, the observer collected their written work and photocopied the notes they had jotted down. The six learners knew that they were participating in an experiment and they knew its aim, which was to improve the learning

system based on the research findings. They were asked to record their thoughts and feelings throughout the experiment in a journal which they handed over to the researchers when the course was over. We will refer to the six students by their initials (CD, EB, YB, AM, EB, CL); quotes from their notes or journals were translated from French into English by the author.

Procedure
1. The teachers in the guided autonomy system were asked to develop a model of a comprehension task in the form of a flow chart, to which the students' work would be compared.

An observation grid based on this flow chart was used to record the students' behaviour, indicating the duration and changes of each, and also the materials used. The researchers also collected the notes taken by the students while they were being observed in order to find out if there was a link between the way in which students behaved and the way in which they took notes. Cross-checking behavioural and linguistic data revealed the following elements:

1. The students preferred written tasks to listening tasks.
2. The students rarely changed their courseware or material once they found something that suited them.
3. Little time was devoted to planning the task (3%) or to controlling the task (15%); most of the time was devoted to task execution (82%).
4. Self-regulating behaviours such as taking notes, checking, looking up in other materials, in dictionaries and on-line tools were frequent; on the contrary, other-regulating behaviours –communication with native students, peers or teachers – were rare.

From the analysis of the notes, three learning strategies emerged, corresponding to three different goals: *epistemic*, when the students were focused on acquiring English language; *procedural*, when they only practised for the examination; and *mixed*, when they sought to do both.

Further questioning
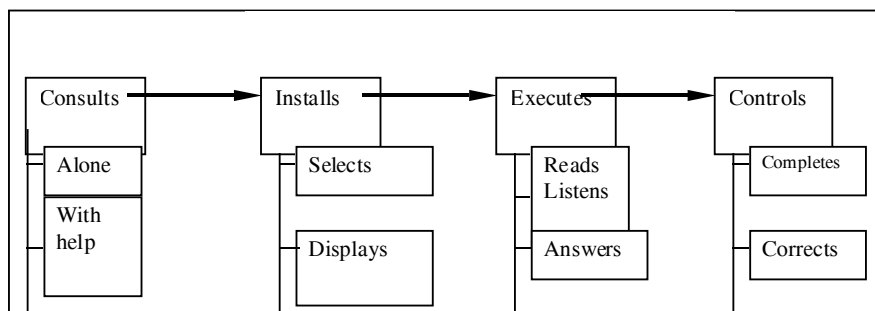The broad picture yielded by this analysis was that of a learning context in which

Fig. 1 The comprehension flowchart

Notes taken by L.R. Session N°3. Material=Film **Baie des cochons ø Kennedy is entirely respons. for it.**2 reasons:int. of the USA for Latin Am.Strate. Consequ. Relati° N/S and W/E Obse°Castro 60 to 65 8 murder. Attempts by CIA. **The epistemic focus** **(4 observations/36)**	Notes taken by Y.B. Session N°1. Material=Internet+CD Rom+dictionnary **A/ -1** **B/24** **C/18** **Total=43** **The procedural focus**	Notes taken by Y.B. Session N°1. Material=Internet+CD Rom+dictionnary 34/B 19/C Skill=habileté Children learn to be too dependant <u>on</u> teachers <u>instead of making</u> judgements by themselves **The mixed focus** **(25 observations/36)**

Fig. 2 Three learning strategies emerge

students were able to build up a limited number of strategies, and not many metacognitive ones. The primacy of the mixed model showed that these students had already gone some way on the path to autonomy, since an autonomous learner is able to pursue both procedural and epistemic goals at the same time.

Yet, these results raised several questions which could not be answered by these data. Why did the students communicate so little with each other? Why did they so rarely ask for help from the tutors? What technical, pedagogical or epistemic difficulties did they meet with as they worked on their own? Finally, did they find self-study in a CAALL environment motivating or discouraging?

3.5.2 The journal analysis: looking for motivational patterns

During the experiment, students had agreed to keep a journal in which they recorded their impressions of guided autonomy work. Journals are essential tools for researchers since they convey the students' fears, difficulties, successes and satisfactions.

Two analyses were carried out: an initial automated analysis of the journals of all 32 students in the guided autonomy class; and a second qualitative analysis of the six students' appraisal of the guided autonomy course. In the limited space of this paper, we will report on the most significant results.

In order to make sense of the journals, we carried out a lexical and syntactic analysis of the journals using a program called *Tropes* (Ghiglione, Bromberg & Molette, 1998).[1] This automated analysis yielded a broad image of what students chose to write about and how they expressed it.

On the basis of the cognitive and motivational constructs elaborated in section 2, a list of four meta-categories related to CAALL was drawn up.

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1 There exists an English version of this program. See: http://www.semantic-knowledge.com/
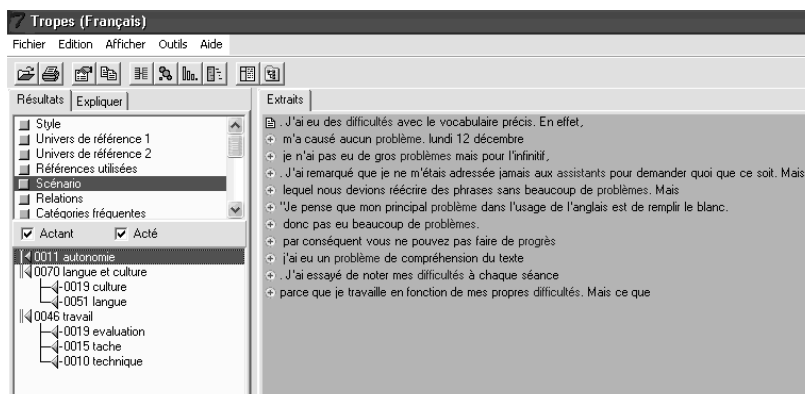
Fig. 3 Tropes' automated lexical analyses

1. The content domain: 'foreign language'.
2. The instruments used: 'technology'.
3. The task: 'work'.
4. The self-study mode: 'autonomy'.

Next, the 36 journals of the entire guided autonomy class (to which the six students belonged) were merged into a single corpus, in order to create a global document which would serve as an average model to which the six students' journals would be compared. Then, *Tropes* extracted all the words relating to each meta-category and placed them in the corresponding category. Finally, each journal was then submitted to *Tropes*' automated analysis.[2]

The homogeneity of these results is striking: for all students, the major semantic network is that of *language learning* and the second is *work*. This analysis confirmed the relevance of the three strategic models that had emerged from our observations, with the mixed model dominating. Students were preoccupied with both epistemic (foreign language) and procedural (work) matters. If the technological or autonomous fields had prevailed over the language-learning field, it would have shown that the students' attention was focused on technical or self-regulating difficulties to the detriment of the learning goal. Yet, these results needed confirmation since Piaget's or Vytgotsky's theories (and the teachers' experience) would have predicted that self-regulated learning *should* have raised some difficulties. It was thus necessary to cross-check these data.

It was therefore decided, in order to understand better how they felt about the learning context and self-regulated learning, to look at the deitic words, expressing their feelings about the new learning environment. In the limited space of this paper, only the two most significant results obtained from this discourse analysis will be presented, those

1 InTable 1, the percentages do not correspond to the total number of words in the journals. The program finds and adds up the words, and only the words, corresponding to the four meta-categories. The total of these words makes 100%. Then, it calculates the percentage of each category. (See, for example, in line one "all journals collapsed", 48+28+12+12 make 100%.)

Table 1 *Percentage of occurrences of each meta-category for the entire class, and for the six project subjects*

RESULTS

Meta references →	Foreign language	Work	Technique	Autonomy
Subjects ↓				
All journals collapsed	48%	28%	12%	12%
C.D.	41%	39%	10%	10%
E.B.	38%	31%	19%	12%
A.M.	38%	31%	27%	14%
L.R.	39%	28%	14%	19%
Y.B.	57%	28%	4%	11%
C.L.	52%	31%	10%	7%

bearing on personal pronouns and those bearing on the subjective adjectives.

An analysis of the use and proportion of *personal pronouns* conveying the writers' viewpoint provided preliminary information.

The first person 'je' (I) represented 87% of the total amount of personal pronouns; the first person plural 'nous' (we), 7%; the second person 'vous' (you), 3% and the impersonal pronoun 'on', 3 %. 'On' is an impersonal French pronoun which is used in colloquial French as an equivalent to *nous* (first person plural); it can also have an impersonal meaning close to the English pronoun one (and can even be translated by a passive structure in English).

Most of the time, students wrote in the first person, which was not surprising considering the nature of a journal. Yet, the strength of the result shows that the students were really involved in what they were writing, that the journals served as a self-regulating tool, and that the subjects intended to convey to the researcher what they regarded as their own feelings about CAALL, even if that feeling or judgment was, in fact, partly socially determined. When they used 'we' for example in: 'We did not have the self-study material on time' (LR), they spoke in the name of the group of students belonging to the guided autonomy class, but this was strikingly rare. When they used 'you' they included the researcher either directly or as a potential user of CAALL in order to make him or her sympathetic to their difficulties: 'You know, you can't get used to that program, it tells you you're wrong and you don't know why!' (AM). The first 'you' is a direct address, while the second means 'me and you,' the researcher, 'You, who should try to take my place!' A sort of *Captatio Benevolenziae*.

When they used the French '*on*', they took the role of any CAALL user. It could be them, other students, the tutor, or anyone else. 'One cannot easily check one's results with the Internet, it's too complicated." (LR) Using the 'on' sounded like a form of hedging, used to tone down the negative judgment they were expressing about the system by putting some distance between themselves and their judgments.

The fact that they rarely addressed the researcher and rarely wrote as members of a social group (the guided autonomy class) seems to indicate that the self-regulated work led them to adopt a self-centered viewpoint, expressed through a sort of *private* speech. It also suggested, however, that their motivation was intrinsically governed. This hunch had to be confirmed or denied by other qualitative analyses.

Table 2 *Number of occurrences of the subjective adjectives in their positive and negative values*

adjectives	Value (-)	Value (+)
difficult	16	1
good	4	10
Alone	3	6
interesting	8	0
new	3	2
easy	1	4
different	2	2
free	1	3
efficient	2	0
pleasant	1	3
simple	3	1
clair	1	3
hard	3	0
bad	3	0
small	3	0
personal	3	0
own	2	0
better	0	2
useful	2	2
	61	39

It seemed relevant to analyse the students' use of subjective adjectives, expressing a positive or negative judgment on the system. Here is an example concerning the use of the adjective 'difficult':

The proportion of adjectives used to convey negative feelings (61%) largely prevailed over those used to convey positive feelings (39%). The adjective which ranked first (16%) was *difficult*, embedded in negative judgment statements. All in all, results led us to modify the initial interpretations based on the analysis of the substantives, in which the semantic network associated with 'autonomy' came third. This form of work was, indeed, difficult for our six subjects to master and motivation sometimes seemed difficult to sustain. This modification of a former judgment – stemming from a new set of data – illustrates the cross-checking method.

In order to verify and refine our results, we next carried out a qualitative analysis of the six students' appraisal of the guided autonomy system.

Qualitative analysis of the journal contents
In the journals written by the six students who had been observed, we looked for all the judgments expressing the impact of internal or external motivational factors.

Goal achievement
All of the subjects redefined their task according to their own goals. They built their own linguistic project independently of the teacher or the final examination.

'…after re-reading my G.A. course, I have decided to work on all the essential points in English. Today, I have chosen the modals. I am not going to do any

comprehension work; I'd rather work on the grammar.' (YB)

Did guided autonomy help them improve their foreign language competence? One student was entirely satisfied with her work: 'I have been doing very different things, I have improved a lot.' Another one was clearly dejected: 'I am sure I have lost my ability to understand spoken English and to speak English myself.' The other four students expressed mixed feelings.

Attribution

The students' attributions were mainly internally oriented (72%) – e.g. they laid the blame, or the praise, on their own shortcomings or assets, not on the guided autonomy system. They had their own way of organizing their work and regulating the task.

> "I have chosen to study the present context closely, following the hand-out that Mrs. X gave us. I used the book "English Grammar in Use" to study the different points and then I practiced with different CD ROMS. I particularly liked "Reflex English" because of the variety of activities it offers." (AM)

When they accounted for their difficulties, they stressed problems related to their linguistic gaps (47%):

> "Most exercises are too difficult for me. It is the vocabulary, most of the time… there are also too many expressions I can't understand…" (CL)

The reason which came second was autonomous work (35%). Their cognitive difficulties were due to the novelty of this type of work, supporting Piaget's theory of an initial state of disequilibrium, and the need for developing new learning schemes suited to the autonomous pattern of CAALL.

> 'There is not enough continuity between the guided sessions and the sessions when we are on our own. The teacher should monitor our work better.' (LR)
> 'It's so different from traditional classes! Sometimes I didn't know where to start. It took me some time to get organized.' (AM)

The lack of effort came third, representing only 15% of the total attributions.

> 'This course has been profitable for me but I did not work enough and did not plan my work properly, so, my English did not improve very much'. (CD)

Technical problems came last with only 3% of the total attributions.

> 'It's a pity we got the material so late.' (CD)
> 'I can't get used to that program. It says I'm wrong when I am right! It's really discouraging.' (AM)
> 'It's no use trying to find interesting grammar on the Internet. I'm lost. I'd rather use a normal course book!' (CL)

The 'human' factor

The journals did not refer to other students' work which meant that Bandura's vicarious model described above did not work at all. Students did not benefit from other students' help or experience. Five of the subjects mentioned the fact that they could have asked for help, but didn't, without saying why. They never referred, either, to the teachers' recommendations, or the explanatory leaflets concerning self-regulated work; when they mentioned their teacher, it was to mention his/her linguistic contributions or corrections.

> 'We have not been able to really make use of the guiding staff. Personally, I did not dare ask them, because it was not very clear whether we should ask them or wait until they came up to us.' (YB)

Those results show the relevance and complexity of Vytgosky's regulation model, from 'self' to 'other.' In goal setting and strategies, the students clearly acted independently; for feedback, evaluation, and control, they felt that they still needed some 'other-regulation'… without always requesting it!

The technological factor

Here again, the qualitative analysis corroborated the quantitative results, since the 'technological factor' did not occupy a large place in the journals. The computer's good qualities were its novelty, speed, and the fact that it made it possible to work on one's own. Its bad qualities were navigation difficulties with certain programs, and disagreement with the computer's evaluation of students' work. Other electronic tools such as TV sets or tape recorders are not mentioned at all as artefacts (e.g. for technical reasons), only as learning instruments (e.g. for pedagogical reasons): 'I watched a lot of videos. It's really good to improve your comprehension' (CD). No student mentioned that they found using the computer more efficient than using printed documents.

Evaluation and future prospects

Despite the difficulties, did they appreciate the course? Did they wish to renew the experience?

Results overlapped those of goal achievement, since the same student who had the feeling she had improved was enthusiastic about guided autonomy and wished to renew the experience the following year (CD), while the student who felt she had not improved at all, wrote that it was "a cock and bull system" (CL), and wished to go back to traditional teaching. The other four said they did like the course and wished to take another guided autonomy course, provided some improvements were made.

Finally, what improvements did they suggest?

First, they all asked for language practice classes. Although they had voluntarily chosen a written competence class, they seemed to regret it. They felt they had lost their ability to speak English, and they found it frustrating not to put the language into practice. Three of them suggested at least practising communicative written English through forums or through chats or e-mail correspondence, not just preparing for examinations. It showed that although the social element did not appear very much in their journals, and although they believed that individual work was necessary, they were well aware that studying a language and not using it in an authentic way is frustrating and absurd.

3.6 Integrating the cognitive and motivational results

When we tentatively interpret these results in the light of Piaget's and Vygotsky's constructs, combining cognitive and affective factors, three models emerge.

3.6.1 The accommodating/motivated model
One student (CD) embodied the perfectly integrating/motivated model:

- She developed new cognitive and linguistic strategies and regretted that the staff did not suggest more.
- She was able to self-regulate her work. For instance, she altered the system to suit her own linguistic goals (working a lot on films to improve her comprehension pleasantly), but did not neglect practising for the exam. She regularly controlled her work, either personally, or using self-examination material or the tutors' assistance.
- She was the only one to ask regularly for help from the staff, not only retro-actively but also pro-actively.
- She derived a lot of pleasure and a feeling of achievement from autonomous work and wished to renew the experience.

An essential element in this model is that she had *the highest linguistic level* among the six students. It confirmed both Piaget's and Vygotsky's theories applied to CALL, e.g. that the more knowledge one has in the activity domain, the fewer difficulties one meets in developing new schemes or achieving self-regulation. It is not sufficient to have a high foreign language level for a student to feel comfortable with autonomous forms of work with ICT, yet there is no doubt that a high linguistic level helps because it makes it possible for the learner to pay more attention to the content of the work and to the handling of the artefacts.'

3.6.2 The failing/dejected model
One student (CL) embodied a failing/dejected model.

- She had difficulties in developing new learning strategies since she did not understand the guided autonomy system and found the comprehension tasks too demanding.
- She switched from one set of course material to another, and finally decided to do only grammar and vocabulary practice. She only used *English Grammar in Use*, "not to waste [her] time," and a book on vocabulary learning. She tried to work on CD ROMs and soon gave up, and never used tape recorders, videos or the Internet.
- She explicitly preferred traditional classes, in which "a teacher was always there to explain the work" and "the linguistic work was far less demanding."
- She did not dare ask for any help and regretted it.
- She did not have the feeling she had improved her English, and refused to renew the experience.

It is important to notice that her linguistic level was not an obstacle to her adaptation to

the learning environment, and that she never blamed the equipment for her difficulties. Other social and cultural traits, such as finding herself in a new town, a new university, away from home, may partly account for her attachment to her former language-learning setting, and her rejection of the new work environment.

> 'In Dijon, where I am from, it was all different. They say language teaching is very different from one university to another and I now realize it's true. I could have asked for some help but I did not dare to.' (CL)

3.6.3 *The doubtful/assimilating model*

The four other students (LR; YB; EB; AM) illustrate the assimilating model.

- These students were able to actually plan their work, then to engage in different learning tasks, but they had difficulty regulating the task and maintaining their effort.
- They asked their teachers for retroactive help during the group sessions, but none of them asked for help during the self-study sessions.
- They enjoyed the freedom of choice provided by guided autonomy, but lamented the fact that they did not get more support, and were concerned about a lack of linguistic progress.
- They enjoyed working with the computer because 'it was more fun' (YB), and they 'could use different applications at the same time so it was easier to check [their] work.' (AM)
- They all wished to renew the experience, provided that improvements were made, notably in the language practice sessions.

4 Discussion

One of the main goals of this study was to know if tools, as such, actually had an impact on the students' task motivation throughout the project (see, Dörnyei dynamic model of motivation, 2003). Results from the journals analysis showed that tools did not play a major part during the pre-actional phase when students decided on their learning tasks. Students first set their goal and then chose the materials and tools necessary to achieve it. However, tools and materials were essential during the actional phase when students were carrying out their task: linguistic tools such as data banks, learning sites or CD-ROMS served to provide them with language resources, while cognitive tools such as online dictionaries, spelling correctors and storage applications, served to regulate the task in the course of action. During this phase, the intrinsic technical assets of ICT increased the students' motivation, essentially in two ways. One is that they opened up new perspectives for their language work. The other is that they increased their autonomy, by making it possible for them to develop and control their work according to their own characteristics and wishes, and not just to the teachers' prescriptions. Finally, during the post-actional, appraising phase, tools and materials were not often mentioned. When students mentioned them it was essentially to denounce their absence or malfunctioning, not their potentialities or assets.

In conclusion, what is important for motivation is not the technical dimension but the

pedagogical dimension of artefacts, the interactions which occur between the properties of the artefacts, and the learners' individual characteristics.

Borrowing from this study and our previous ones, it is now possible to tentatively build up a model of the motivational functions of tools in a language-learning setting. This model includes four dimensions of the motivational factor: the level of analysis, the different motivational functions of the technology, the weight of each factor and, finally, the positive or negative impact of the factor. The level of analysis of the technology varies according to tools, instruments, settings and environments. We have found that the technology may ensure four different motivational functions:

- The *basic function* involves the pre- and operational stages. The technology is a necessary condition for task achievement. For instance, an audio programme is necessary to exchange audio files and to orally communicate through the web; likewise an e-mail application is needed for written correspondence.
- The *hook function* involves the pre-operational stage. It happens when the technology suggests a different way of doing things. For instance, discovering a concordancer and the use of collocations may induce one learner to approach vocabulary learning differently.
- The *regulative function* involves the operational stage. It exists when a learner finds him/herself at a dead-end, and the technology affords him/her an alternative strategy. For instance, using a browser may enable a learner to find the information he/she has not found yet in a printed paper; using a teaching platform makes it possible for teachers to keep their teaching content up-to-date, and to make it constantly available for their students.
- The *restore function* involves the post-operational stage. When learners have successfully mastered a new technology during interaction in the foreign language, their self-image is enhanced. For instance, in Raby (in print), French pupils who had been able to use *Dreamweaver* to create the homepage of an on line-journal said they had never thought they would be able to create a home page in a foreign language.

The motivational weight may also differ since the technology may work as a *primary factor,* in which case it is a *sine qua non* condition for the goal to be achieved, or it may work as a *secondary factor*, in which case it only *enhances* the task execution process. Motivational weight does not depend on the artefact as such but on the 'negotiation' which takes place in the learners' minds during the task redefinition process, between different means of attaining one's goals.

Finally, it is also important to bear in mind that the technology is like Aosepus' tongue: That it is not good or 'right' or 'efficient' in itself: the same factor may act in a positive *motivational* or negative, *demotivational* way, or even have no impact at all, *amotivational*. For example, we found that some students felt that creating a *blog* might serve as a 'hook', whilst other students found it too demanding. In other circumstances, we found that being able to chat on the Web was felt as motivational by some pupils while other pupils purely and simply discarded that opportunity as irrelevant to their work.

We tested these four dimensional models in a further study in which we tried to elicit the interactional face of the motivational process. This research took place in three

French secondary schools. It involved an ICT project-based course: a webquest on the press. We improved the cross-checking methodology since the study encompassed both the teachers and the learners. The aim was to know whether the interactions which took place between teachers and learners impacted on their motivation. Some results have been published (Raby, 2006), others are still underway (Raby & Pénilla, in process).

5 Conclusion

We agree with Chapelle's (2003) and Egbert's (2005) remarks on CALL methodology when they write that what is needed now for CALL is less miscellaneous, fragmented, empirical research, and more generalizable, consistent results. We are now conducting large-scale studies in French secondary schools and in French higher education, in order to elicit 'consistent and robust results' concerning the motivational impact of CAALL learning and teaching systems. Blin's discussion (2004) of the difficulties met in evaluating learner autonomy in CAALL contexts perfectly applies to learner motivation in the same context. 'New paradigms are called for, which should offer guidelines to carry out adequate judgmental and empirical studies' (Blin, 2004: 382). Reflecting on what should be placed on the new agenda, it seems to us that up to now little research has focused on the teachers' side of motivation, and that we need to know more about what hampers or sustains teachers' motivation. This is particularly important, since according to Dornyei (2003: 156), it is now well-established that 'the teacher's level of enthusiasm and commitment is one of the most important factors that affect the learner's motivation to learn.' Another interesting field for motivational research is provided by distance language learning, with learning platforms. Studies of the motivating impact of these new learning modalities are necessary, but no specific research methodology has yet been devised to take into account the complexity of these new social and cognitive learning systems (Clebborne, Maddux & Ewin Taylor, 2003). Finally, we have found that training teachers in CALL motivation is clearly missing in most teacher training curricula. For instance, in Hubbard & Levy's important *Teacher Education in CALL* (2006), the word 'motivation' is absent from all 20 chapter titles even though the theme of motivation runs through the entire book.

Acknowledgements

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