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Second Language Distance Learning and Teaching

Theoretical Perspectives and Didactic Ergonomics

Jean-Claude Bertin, Patrick Gravé, & Jean-Paul Narcy-Combes

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Foreword

Since the 1980s, many universities have been engaged in one way or another in the use of computer technology in teaching, including foreign language teaching. It was also in the 1980s that computer-assisted language learning (CALL) emerged as a discipline with the publication of the CALICO Journal in 1983 and ReCALL soon after in 1989. Since the 1990s when the World Wide Web came into its own, many universities have implemented Web-based teaching materials in support of language learning, a process that has culminated in blended language courses (Chenoweth, Ushida, & Murday, 2006) and a few completely online courses (Blake & Delforge, 2005). The encouragement for using Web-based teaching has sometimes been imposed by university administrations in the hope that the use of technology would enable institutions to retain their competitive edge with other institutions for the purpose of recruiting students or in the belief that the use of technology would somehow reduce educational costs by having more students taught per faculty member. In some cases, the result was the creation of hastily developed Web pages containing supplementary instruction—essentially re-presenting classroom activities—or exercises—essentially replicating workbook activities—that offer relatively little added value to second language teaching. While excitement ran high as developers created Web page after Web page, few general principles were available to guide the design of these pages other than those governing technical requirements for Web page creation.

As the field of CALL began to mature and as interest in computer-based distance education continued to grow at the turn of the 21st century, researchers and practitioners began to seriously investigate the features of computer technology as a way to operationalize second language acquisition precepts and also to capitalize on its strengths in distance language learning. Computer-mediated communication (CMC) quickly came to the fore as a means to enhance negotiation of meaning and focus on form as learners communicated with native speakers in CMC sessions. Studies also began to appear which showed that blended learning and completely online learning yielded results in student achievement comparable to those in face-to-face learning settings. Most of these results concerned discrete aspects of language learning, for example, individual grammatical structures and specific parts of individual courses (e.g., Collentine, 2000). Other publications examined distance language learning in more general terms, providing stronger theoretical bases for the sociocultural elements prevalent in its use and preliminary delineations of best practices for online learning (e.g., see Felix, 2003; Belz & Thorne, 2006; Goertler & Winke, 2008; Lomicka & Lord, 2009).

What has been lacking up to this point is an overall didactic framework for distance language learning. The current volume goes a long way in addressing this need. Jean-Claude Bertin, Patrick Gravé, and Jean-Paul Narcy-Combes propose a conceptual framework for distance language learning and construct

a model of online language learning environments. Their model displays various components (e.g., teacher, learner, language, context, etc.) and, more important, how these components are interrelated. The various components and their interrelationships are schematically presented in a figure in Chapter 1 and then discussed in considerable detail in the following chapters. Of primary importance for the authors are the complex ways in which events that can occur in any given component can potentially affect actions in all the other components. Thus, for example, a task assigned by the teacher can lead learners to search for necessary informational resources, seek language learning help, interact with other learners, request guidance from the teacher or tutor, and present a final report, almost all of which is mediated by the computer. The authors call their model a "didactic ergonomics" model because it portrays a very general view of the teaching/learning situation and focuses on the parameters of the online learning space designed to facilitate students' language learning efforts.

At its most general level, the model the authors propose is a conceptual framework for online learning that they ground in theories and research findings from a variety of disciplines. As such, it offers a broad pedagogical perspective in which to view distance language learning in much the same way that Colpaert (2004) offers a broad engineering perspective in which to view interactive language learning courseware. While Colpaert concentrates on software development, Bertin, Gravé, and Narcy-Combes concentrate on the interactions of learners with course content, real-world information, language resources, teacher, tutor, and so on, independent of any software or hardware used to support those interactions.

At its most concrete level, the model highlights the factors that underlie the creation, administration, and evaluation of task-based language teaching in online courses. In the context of task-based language teaching, the authors underscore the importance of the cyclic application of micro- and macro tasks that leads ultimately to students' completion of major course objectives, typically in the form of a presentation of a work product directly corresponding to professional contexts in the real world. In order to accomplish tasks, students must be not only active participants in the learning process but also direct their own learning—with assistance from others as necessary—and must accept what the authors call "epistemological responsibility" for the organization of their learning. Although, in this writer's opinion, true learner autonomy remains an unresolved question in distance education, the authors demonstrate how distance education puts learners' epistemological responsibility into relief. In fact, the authors show that the characteristics endemic to distance education (e.g., time, place, and social distance) bring into explicit focus the elements of language teaching that are often taken for granted in the classroom; as they state, distance education "creates the need to constantly raise awareness of traditionally implicit processes and strategies."

All in all, the current volume sheds light on the fundamental processes involved in distance language learning. The authors support their analysis of distance language learning environments with theoretical constructs from several disciplinary perspectives. The didactic ergonomics model that emerges from their analysis reveals the complexity that can arise from the interaction of the components of their model. Although the complexity of these interactions may seem daunting at first glance, it is an issue that researchers, practitioners, and course developers in CALL need to take into account in order to understand—and to create—pedagogically effective online language learning environments.

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Preface

Language and technology have long been related. The development of railroad transportation, steam navigation and the telephone marked the beginning of an era of national linguistic unification not only in Europe and North America, but in most other regions of the world (Porcher & Groux, 1998). Air transportation, radio and television heightened the phenomenon, and McLuhan (1964) felt it possible to speak of the world as a global village. The rapid development of ICT, in particular of the Internet, initially seemed to be paving the way for English as a *lingua franca* in the world. Contrary to the preceding media, ICT offers the possibility of responding individually, which was the case of the telephone too, in a much more limited way, when it was invented. Consequently, two trends of unequal strength can now be felt. On the one hand, English has undoubtedly become the language everyone feels they should learn. On the other hand, migrations have increased the need to learn the languages of the host countries, and studies abroad have increased the need to be able to cope with academic demands. In Europe, institutions such as the Council of Europe or the European Union have played an important role in developing language studies across the continent to facilitate intra-community exchanges. Finally, the notion of sharing life in a multicultural and multilingual world has become more and more appealing to many people and is creating a new demand for language courses.

The demand for language studies has been on the rise since the early seventies in school systems as well as in further education. Continuing education quickly saw the advantages of self-directed learning and resource centers in facilitating language learning for adults juggling a professional life and a family life. Universities followed suit. The advent of the computer and the development of the Internet made it possible to believe that one could learn at a distance. Some countries had already developed distance education, mainly for geographical reasons (Australia, Canada, etc.), but others discovered that it could provide valid solutions, in particular for adults who wanted to further their education or make a fresh start. The Open University in Britain is the most famous example, but other countries followed in the same direction (Bates, 2005). As computer-based communication technologies developed, distance language learning became an attractive and apparently reasonable alternative, especially as the potentialities of computer-enhanced learning offered more and more convincing interactions.

However, one of the most striking features of computer integration within the language learning situation is the enhanced complexity of the concept of pedagogic mediation as well as of the relationships between language, learners and teachers. This complexity may be accounted for by several factors:

- the multiplicity of pedagogic objectives justifying the resort to Information and Communication Technologies (ICT): such as looking for information, webquests and multimedia tasks, specific interactive exercises and the availability of virtual curricula for learners;

- the multiplicity of existing software and online tools for language learning: e.g., commercial CD-ROMs for multimedia training, customized materials developed with authoring systems, language specific or general purpose websites;
- the multiplicity of ICT potential uses: if one commonly speaks of "the computer", current practice reveals a wide array of uses ranging from:
    - materials aiming at complementing traditional face-to-face courses to environments especially designed for distance learning;
    - from very specific software (e.g. exercisers, tutorials) to integrated learning environments (i.e. that offer a coherent range of materials, learning tools and follow-up devices, among others);
    - from pedagogic diversion of generic software (such as text processors and the Internet) to very elaborate and (mainly) experimental applications, via the whole range of commercial products as well as Computer Mediated Communication (CMC) technologies such as chats, instant messaging, videoconferencing.

Furthermore, integrating ICT within a language learning situation presupposes organizing reflection both for individual actors and pedagogic teams along various perspectives.

First, the whole course of action needs to be reconsidered by distinguishing between several types of learning situations: face-to-face learning (man-man) on the one hand and computer-mediated learning (man-computer-man) on the other. Computer-mediated learning can take place on a face-to-face basis, as in the case of multimedia laboratories with the teacher, on a distance basis, which excludes face-to-face situations, or on the more and more frequent blended basis combining distance and face-to-face situations.

Secondly, materials designers have to choose between reproducing traditional paper-based materials in a digital media and completely reworking activities according to the specific features of the computer and the modes of learning (face-to-face, distance…).

Finally, integrating ICT implies considering the conditions of transferring traditional roles to the new environment as well as the emergence of new roles, such as tutors, and designers.

Such complexity makes it difficult for the various actors of the teaching/learning situation to form a clear idea of the various ways of answering a basic question: how to meet the specific needs of a given public in a given institutional context? Little, however, has been said so far about how this complexified pedagogic relationship requires a new vision of underlying theories. It has now become necessary to reassess the roles and interactions of the traditional actors as well as to describe the new roles emerging from a situation significantly affected both by ICT and distance. Revisiting theory in the context of distance learning, irrespective of the various possible uses of technology, will shed new light on mediation at a distance and help suggest a conceptual framework that can guide teachers, researchers as well as developers and administrators in the field.

For various reasons, distance learning and e-learning in particular have been seen as vital stakes in the field of education and at times a belief in their magic powers was all too evident in some circles (Annoot, 1996).

A new paradigm (Perriault, 1996) has influenced all educational institutions: since networks were connected and media became digital, the diversification of online courses has gone with the necessity of accepting competition and of coping with a radical change in scale. The industrialization of knowledge is not compatible with amateurism, and the protected academic world has had to open up to competition

with courses offered by less traditional institutions. Furthermore, the variety of online courses has blurred traditional beliefs on roles of teachers and learners that can no longer be seen as static. The increasing number of sites changes the situation in a way which cannot yet be anticipated.

It is therefore imperative to construct models that include all the specific parameters of distance education. Doing this implies going into different fields of study with different approaches to research and no unified paradigm (Kuhn, 1970). No one field of the human sciences will cover all the parameters and because of its technological complexity; ICT goes beyond the traditional realm of the human sciences in many of its aspects.

Going over different fields of research will be a test of our epistemological responsibility and the way in which we construct our knowledge (Kelly, 2005). M. McLuhan (1962) insisted that in bringing all social and political functions together in a sudden implosion, electric speed has heightened human awareness of responsibility to an intense degree. *All life is problem solving*, Popper used to say (1999). He suggested determining first of all the problem, then formulating tentative theories, and then trying to invalidate these theories (1999, p. 14).

Determining an object of research means overcoming a number of obstacles which Bachelard (1938) called epistemological obstacles. These obstacles make it difficult or impossible for individuals to construct the object they are researching in a scientific way. Experience and "general" knowledge are two of these obstacles. Experience and "general knowledge" often rely on social constructs, described as a phenomenon "invented" or "constructed" by participants in a particular culture or society because they agree to behave as if it exists in order to follow certain conventional rules. Distance second language learning is likely to reflect a number of such social constructs which we will have to analyze and redefine according to the theories available.

In fields such as testing (Chapelle, 2003), a concept called construct plays an important role, and construct validity is of paramount importance, it is connected to theory, in the sense that a construct will be valid if its theoretical construction is sound. Its theoretical construction will depend on the theories the researchers refer to (Chapelle, 2003). In this sense, theoretical construct validation is considered to function as a unified framework for validity (Kane, 2001).

In this book, the authors problematize the construct of distance second language learning, in order to see what it covers, if its parameters are well-defined, what theories can guide the actions of the participants, and whether a model of action can be suggested with a method to validate the model. This book is research-based, and not method-based (Ellis, 1997), it results from the collaborative work of researchers belonging to two different laboratories and having different scientific backgrounds, which will be reflected in the content of the twelve chapters.

The construction of our model resulted from a number of research projects (Bertin & Annoot, 2000; Bertin et al, 2005; Bertin & Gravé, 2006; Bertin et al., 2007; Narcy-Combes, 2005) and from doctoral dissertations which clarified the situation, their authors will be duly mentioned. Action research (see Burns, 1995, Ellis 1997, and Narcy-Combes, 2005) was carried out when courses were implemented, but other research methodologies were applied when specific data had to be collected (Juan, 1999). The most interesting result is related to the role of the context which is by far the most important element in language learning environments as exemplified in Benoit (2004) (French high schools), Khreim (2008) (Syrian further education), and Fanou (2009) (Universities in Benin). Taking the context into account imposes the recourse to more of the human sciences than was the case before and research and theorizing becomes even more complex. Thus, it was necessary to combine the didactician's approach with a more

explicit psycho-sociological perspective (Gravé, 2002). The degree of interdisciplinarity introduced in this book enhances the originality of its contribution.

Following Seliger and Shohamy (1989), Narcy-Combes (2005) and Bertin & Narcy-Combes (2008), we will state our epistemological position in clear terms.

Our approach is comprehensive (Weber, 1920): in this book, we are going to present how research has enabled us to understand phenomena and what we assume can be done accordingly. Theories are only approximations of reality (Chalmers, 1987; Jordan, 2004), but they can help us change the course of things, if constant attempts at invalidation are carried out. While constructing a model to guide our actions, we remain conscious that it should be flexible and adaptive, as we have an idiographic approach to the study of human phenomena. Humans may be neurobiologically similar, but their psychological and social construction makes them all different (cf. LeDoux, 2003). The main stance taken in this book is close to emergentism as reported in (Dörnyei, 2009) and (Randall, 2007), and special reference will be made to systemics as well as to the study of complexity (Le Moigne, 1977; Morin, 1980). It should be borne in mind that the French concept of systemics on which our approach is grounded is close to the American dynamic systems theory as referred to in (Herdina & Jessner, 2002, Jessner, 2006 and Randall, 2007) to which the reader might be more familiar with.

The book is structured in three parts. The three authors contribute to the fields in which they specialize, though the book was designed as a coherent and complementary whole, which explains its organization. The preface, introductions to parts and general conclusion were written collaboratively, and cross-references will highlight the coherence.

Section 1 is to be read as an introduction to didactic ergonomics as originally developed by Bertin (2000, 2001). The psycho-sociological perspective brought by Gravé (2002) explains the originality of the approach: instead of describing distance second language learning experiments, this book provides principles for understanding, designing, and running learning environments. The objective of Section 1 is to explain how the didactic ergonomic perspective can help grasp the complexity of the reality of distance language learning. It will justify the recourse to theories and models for all the actors concerned (researchers, practitioners, designers, administrators, etc.).

Chapter 1 reads like a gradual construction of the didactic ergonomics model which serves as a reference for the approach developed in the book. It begins with a reminder of the various theories accounting for the notion of complexity. Then, the various models traditionally used to describe pedagogic and, more specifically, language learning situations are reviewed. The notion of ergonomics is introduced in order to show why it is necessary to distinguish didactic ergonomics from the industrial context in which the concept was originally developed. After reviewing the main ergonomic models, the three authors show how they build a specific model for language learning.

Chapter 2 explains how the model can account for the introduction of distance. After reviewing what is commonly understood as distance learning, the authors resort to a concept derived from psychosociology, the concept of analyzer. Rather than being just another component of the system, distance is shown to reveal aspects of language learning which traditionally remain 'hidden', i.e. implicit. Applying this concept to our field of study first highlights a distinction between three different levels of mediation, then it reveals the nature of the virtual – or 'enriched' – reality displayed on the computer screen, and finally it shows how distance as an 'analyzer' makes it possible to better understand space and time as well as social interactions. Technological mediation is also seen in a new light.

In Chapter 3, Narcy-Combes introduces "Language" as a construct in a systemic approach and shows its indissociable connection with culture and content. Language is a complex construct and distinguishing

between the faculty, the different forms it can take and their descriptions is shown to be of importance. The link between language and ordinary cognition is investigated, especially as a way of facilitating second language acquisition. Piaget's assimilation and accommodation and the concept of nativization can help more than has been stressed so far. Plurilingualism, diglossia and polyglossia, context and code switching are revisited in that new light. Some space will be devoted to writing and reading to stress the fact that they are very different from listening and speaking and should not be confused. Learner language and levels and the myth of native speaker usage are now seen in a way that changes traditional expectations of the outcomes of L2 acquisition. The implications for language learning in terms of curriculum design, tasks, integrating content, culture and language etc., are developed and lead into the following section.

Section 2 offers a wide-scope description of the various components of a distance language learning environment. It is necessary to understand the nature of each component and the way the set of interactions reverberates on the components. Section 2 provides a comprehensive vision of the environment, the theoretical options, and the authors' standpoint. While traditional, analytical descriptions tend to discuss the various elements of such environments separately, didactic ergonomics relates them one with the other and addresses the notion of complexity by refusing to avoid areas of uncertainty.

Each chapter discusses the nature of the five elements that constitute the system as well as the process around which it revolves.

Chapter 4 studies learning theories and the need for distanciation. Distanciation is shown to be the essential requirement for developing a capacity for learning. This implies taking into account the relative complexity of the learning task and a new undestanding of the pedagogic relationship to gain access to distributed knowledge. The metaphorical validity of a kaleidoscopic view of theories of second language learning is put forward with the implication that the concepts are the crystals, and the theories what happens to the combination when you rotate the kaleidoscope. The various theories are described under three headings: sophisticated all-encompassing theories, theories that do not cover every aspect of second language learning) and finally, classroom approaches and theory. The crystals that have been retained are listed and the chapter ends with how all the crystals can be accommodated in a model that also includes culture and content.

Chapter 5 will be devoted to the learner pole in the model, revisiting individual differences in second-language learning in the light of recent theories. Language (learning) awareness at a distance will be the obvious follow-up stressing the connection with distanciation and denativization. Metacognitive experiences will differ from face-to-face environments. Autonomy at a distance will be described as a matter of balance between independence and interdependence and is obviously connected to achievement. Reflexive interaction in distance learning connected to such phenomena as affiliation and formative evaluation will be seen to be a key parameter. Learner training in distance learning education cannot be neglected in terms of language awareness, nor in terms of awareness of learning processes, in order to enable the learners to overcome difficulties. The chapter will conclude with a return to the learning cycle showing the part the learner plays in the cycle.

Chapter 6 deals with the teacher pole. Because of the constant need for innovation, teacher education is seen a life-long project that should be related to theory. Teachers have become mediators and they are expected to be able to tackle the complexity of mediation at a distance. They need to understand their new roles and acquire new skills. Monitoring learner activity is shown to require technological support, but, even with technical support, knowing and understanding the learners is no easy task at a distance. In

order to be able to fulfill this job more successfully the teacher will need to understand his or her posture as well. Self-knowledge can help teachers, but assessment by learners and colleagues helps maintain a happy balance in courses. The chapter concludes by going back to the learning cycle and by showing how the teacher operates in the cycle.

Chapter 7 is devoted to the specificity of the 'technology' pole: its extreme variability and rapid evolution makes it impossible to formulate a static definition or description. What is necessary is a dynamic description based on theoretical principles. The essential question is: how can technology enrich didactic reflection and, conversely, how can didactic thinking act as a stimulus for research in technology? After reviewing the evolution of the relationships between technology and education, the authors focus on the central ergonomic notion of instrumentation and on the distinction between technological and pedagogic innovations. Then they consider the place of technology within the field of language learning in the distinction between (global) language learning environments and (virtual) learning spaces. The chapter concludes on the actors' perception of technology.

Chapter 8 highlights the originality of the approach in considering context as a pole in itself. The object of the chapter is to provide answers to three questions:

- How to define context?
- How to integrate the notions of social change and innovation?
- Which conditions can be identified to opt for and support change?

Finally, the chapter will suggest a number of pathways to reconcile theory and action by designing a training and action research program.

Chapter 9 offers a conclusion to the second part by considering the various sets of interactions at work within the ergonomic model on the one hand, and analyzing the way learning environments are structured on the other hand. Finally, the roles of the various actors in distance language learning contexts are defined.

Section 3 deals with putting the model into practice. The authors avoid explicitly referring to time-related elements that would become obsolete too rapidly. Nevertheless, they consider the practical applications of the principles outlined in the earlier parts since the book is meant for researchers, practitioners, and administrators, etc.

In Chapter 10, based on the suggestions for action defined at the end of chapter 8, the engineering methodology is developed by Gravé and Bertin. It includes a description of the four traditional engineering phases. In a second part, the chapter focuses on the implementation phase with an action-research and training component. This component will form the basis of the assessment and regulation phase. Finally, to define the new roles of the actors and especially of the teachers, the chapter will address the central question of teacher training.

Chapter 11 tackles how to actually run courses and Narcy-Combes describes a task-based approach to distance second language learning. The advantages of implementing TBL and a description of three complementary approaches (action-based approach, TBLT and our model) lead to a methodological framework. This organizing framework consists of a dual learning cycle composed of macro tasks and micro tasks in order to adapt TBLT to self-directed and distance learning. Types of tasks are described as well as their sequencing. Task-based approaches have common features that cannot be ignored while taking into account the specificity of distance learning. The chapter is practical and discusses guiding principles and descriptions of how to go from curriculum to course design, while showing that learners

benefit from being course designers. Various approaches for the selection of content (thematic, disciplinary, linguistic) are suggested, followed by a practical discussion of feedback and monitoring. A taxonomy of tasks and its application in the dual cycle includes concrete examples. Assessment concludes the chapter and opens the way to the future.

A final conclusion offers a synthetic overview of the whole book while stressing the authors' present position as far as second language courses are concerned.

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Jean-Claude Bertin
Patrick Gravé
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Section 1

An Introduction to Didactic Ergonomics:

Theoretical Stance

Chapter 1
In Favor of a Model of Didactic Ergonomics

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OBJECTIVES OF THE CHAPTER

This chapter will try to answer the following questions:

- How can the complex reality of distance language learning be accounted for?
- How can former models of language learning contribute to a better understanding of distance language learning?
- How can a didactic ergonomics model give a more accurate representation of the situation?
- How does didactic ergonomics fit into current CALL research?
- What essential components does the didactic ergonomics model highlight in the computer-mediated language learning situation?

This first chapter will introduce the didactic ergonomics approach and present the related computer-mediated language learning model.

We will first consider how to tackle the problem of describing reality in all its complexity, as originally developed by Edgar Morin (1990). The initial review of theories will contribute to a better understanding of the nature of complexity and will eventually lead us to advocate a multi-referenced approach to learning. We will then proceed to define the concept of didactic ergonomics (Bertin 2000, 2001). We will show how the original didactic ergonomics model we suggest is articulated with current CALL research and how it can help bridge the gap between theoretical description and actual practice in the field.

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THEORIES OF COMPLEXITY: AN OVERVIEW

This review will help us outline the main approaches to complexity and the way to tackle the problem of the description of reality. We will here combine theoretical and methodological references deriving from several academic disciplines to consider how each can contribute to a common conceptual framework based on the systemic and interactionist paradigms. This dual perspective will then be applied to the educational field and to the problem of ICT integration. This approach to complexity will help us better understand how the various actors of a distance language learning environment interact.

Systemics

Origin of Systemics

The systemic approach in education derives from research on the general systems theory. This theory was originally elaborated by the group of American researchers formed by the biologist Ludwig Van Bertalanffy, the economist K. Boulding, the biomathematician A. Rapoport and the physiologist R. Gérard. From the 1950's to the 1970's, it rapidly spread around the world and influenced new disciplines such as psychology, psycho-sociology, sociology and political sciences. According to Le Moigne (1977), another origin of systemics may be found in cognitive psychology, artificial intelligence and social psychology.

Numerous other fields such as communication and information sciences or engineering and education sciences contributed to enlarge the general systems theory up to the 1980's. The proponents of systemics base their approach on a criticism of Cartesian rationalism, sometimes called 'analytic perspective' or 'Aristotelian conception', felt to be reductive. Their main argument (Checkland, 1981; Commoner, 1972; Fourez, 1974; Kerlinger, 1964; Le Moigne, 1977; Watzlawick, 1980) is that complex systems cannot be understood with the experimental method. This method assumes a system can be explained by the study of its isolated components. The increased complexity of our world requires a new and more appropriate approach. The influence of present technology at the local as well as the global levels constitutes a limit to the experimental method.

For Lemoigne, systemics pursue the following goals:

- further the understanding of the universe conceived as a system;
- provide a model of complexity;
- identify concepts, laws and models that can be applied to a variety of different systems;
- conceptualize artifacts or tools (Lemoigne, 1977).

Table 1 borrowed from De Rosnay (1975, p.110) compares the two types of approaches.

Lapointe summarizes the situation as follows:

Analytic and systemic approaches are based on distinct epistemological foundations, offer different perceptions of reality, develop their own methodologies and involve objects presenting different levels of complexity[1]*. (Lapointe, 1993, p.4)*

General Systems Properties

To be recognized as such, a system should present a set of properties listed in Table 2, based on Le Moigne (1974, 1977, 1979), De Rosnay (1975), Morin (1977, 1980, 1986) and Lapointe (1993).

System Properties and Educational Technology

Let us now consider how the three systemic dimensions of the previous table can be applied to the computer-mediated learning situation.

Table 1. Analytic and systemic methods - a comparison

Analytic / Experimental method	Systemic approach
Focuses on isolated elements.	Establishes relationships: focuses on interactions between elements.
Considers the nature of interactions.	Considers the effects of interactions.
Relies on details accuracy.	Relies on global perception.
Changes one variable at a time.	Changes groups of variables simultaneously.
Is time-independent: phenomena are reversible.	Is time-dependent: phenomena are irreversible.
Validation comes from experimentation within a given theory.	Validation comes from comparison of the model with reality.
Models are accurate and detailed, but hardly usable for action (e.g. econometric models).	Models are not accurate enough to represent knowledge but can be used for action.
Efficient with linear and limited interactions.	Efficient with strong non-linear interactions.
Entails a disciplinary approach.	Entails a pluridisciplinary approach
Entails a detailed plan of action.	Entails goal-oriented action.
Focuses on detailed knowledge; goals are ill-defined.	Focuses on identification of goals not on details.

The Dynamic Dimension

The dynamic dimension of a learning system may be illustrated by the following examples. If we consider the learners, this dimension consists in raising their initial levels of competence (input) by implementing teaching strategies considered as operating variables. If we turn to the learning environment, a needs analysis system will start from the description of a given situation (input) and build an organized and appropriate syllabus for a specific audience (output). Modifications and adaptations will be based on the collection, processing, analysis and interpretation of data. The notion of a system takes it for granted that it is capable of transforming input into output.

The Structural Dimension

Defining the borders of a system is not always an easy operation. Indeed how can we set limits between interregional, regional or local systems of education? How is it possible to draw the precise perimeter of a learning environment? To what extent is it historically, geographically or sociologically situated? Should the environment

Table 2. System properties

DIMENSIONS	DEFINITIONS AND PROPERTIES	
Dynamic	Changes taking place:	Modification of input by other systems or the environment. → output integrated into other systems or the environment.
Structural	Spatial organization of the system components:	Constitution of the most stable part: • borders: define the outer limits of the system ; • elements; • stores of matter, energy or information; • communication networks for information exchange within the system or with other systems and the environment. (De Rosnay, 1975)
Functional	Temporal organization of processes:	Evolves more rapidly than the structure; involves processes: • related to the transformation of input into output; • related to the control, regulation, adaptation and monitoring of the system (Mélèze, 1972)

be considered at the macro-sociological level of international education policy (e.g. developing language learning in the world) or at the micro-sociological level of the teacher-learner relationships (e.g. tutoring practices in distance learning settings)? In the same way, from what moment can we identify the system from its environment? Such questions are endless. The only solution may be to admit that the researcher or the teacher will at some point define the limits he assigns to the various systems with which he will experiment. The object and its limits remain the observer's constructs.

Similar epistemological choices define the elements that structure the system within its environment. Are we talking about the curriculum for a specific school or university, about a tailor-made solution for a clearly identified audience, for a specific firm, professional branch or a whole sector of activity? These options determine the way the elements will combine to form a system in a given context.

In the language learning context, the stores of information correspond to the educational resources (human actors and materials) that will be submitted to three types of processing: transport, storage and transformation. Language centers are examples of such information stores available to both teachers and learners.

The communication networks enable the transfer of information between different systems or between the system and its environment. As an example, the needs analysis for the design of a learning space makes it necessary to identify specific interfaces between the systems, the various sub-systems and the environment.

The Functional Dimension

The transformation of input into output is determined by a number of criteria which measure the degree of success or failure of the system. In the educational context, these essential variables might be the pedagogic objectives, the syllabus, a course or a single lesson. In our case, output and objectives may point to the same object.

Applying the principle of systemics to education entails observing the relationships between the elements of a system, which may combine into sub-systems with their own specific goals in their own specific contexts. The systemic approach consists of several steps:

- an analysis of the final goals, of the processes and of the learners' characteristics;
- the design of a teaching / learning environment in a given context;
- the evaluation of the system;
- monitoring, adaptation and regulation of the system (the retroaction loop).

Specific Dimensions

Lemoigne (1983) complements this description, deriving from the general theory of systems, with other dimensions better suited to educational systems. Such systems are goal-oriented, complex, equifinal, open and interactive. Table 3 provides a more detailed description of these specific dimensions.

The Palo Alto School and the Interactionist Perspective

The so-called Palo Alto school, sometimes called the 'invisible college' (Winkin Y., 1981), refers to a group of researchers from various horizons. If the preoccupations of such researchers as Gregory Bateson, Paul Watzlawick (communication logic) or Erving Goffman, a sociologist interested in interactions analysis, seem remote the one from the other, they developed a common interdisciplinary approach to interpersonal communication based on the systemic methodology.

The fundamental principles they identified for the communication systemic perspective enlarges the scope of the traditional view of communication as the transfer of information

Table 3. Specific dimensions of educational systems

DIMENSIONS	DEFINITIONS AND PROPERTIES
Goal-oriented	• The goal corresponds to the expected output (e.g. level of language competence to be reached). • The goal must be translated into operational objectives: this means identifying the processes involved and the related didactic options.
Complex	• The system includes a large variety of specialized elements, organized into sub-systems. • Interactions are non-linear. • The number of elements may be difficult to identify. • Interactions are largely variable (De Rosnay, 1975). Educational systems are especially complex.
Equifinal	Equifinality is the principle that a given output can be reached by many potential means (Bertalanffy, 1973). Illustration: no 'one best way' for learning scenarios and learners' strategies.
Open	The system can exchange information with other systems or the environment: all are connected. Illustration: the teacher's actions form a system in itself, so do the learner's. These two (sub)systems interact in and are influenced by the general system constituted by the learning environment.
Interactive	The components of the system continually interact and are mutually dependent. Illustration: a change in the curriculum entails pedagogic adjustments in terms of contents, methods and modes of teaching/learning. The other components are affected by these changes.

from a transmitter to a receptor. They can be summed up as follows:

- Communication is based on interaction. As opposed to traditional psychology which focuses on the individual rather than on the relationship between individuals, communication is described as a circular process in which each message requires a feedback from the interlocutor.
- Any social behavior conveys a communicative value and cannot be reduced to the message. Any interaction, be it verbal or non-verbal, entails communication of some sort.
- Communication always depends on the context. The context is a formal as well as symbolic framework which involves three types of social reality:
    - the type of relationships which the participants entertain (degree of familiarity, type of acquaintance…);
    - the formal setting in which interaction takes place (university, language center, firm…);
    - the reason for which the participants interact.

The context is made of norms, rules and rituals which should be identified.

- A message conveys two meanings: a declarative meaning (facts, opinions, feelings…) and a social meaning (indications on the participants' relationship).
- The relationships between the participants are structured along two models. In the symmetrical model, the interaction takes place on an egalitarian basis and each person's behavior mirrors the others. In the complementary model, each interlocutor adjusts his behavior to the other. A complementary relationship can be hierarchical.

Soon, Bateson was joined by three important researchers from the Chicago School of interactionist sociology: Georg Simmel, a sociologist, John Dewey, a philosopher and G.H. Mead, a psycho-sociologist. Together, they developed the idea that social reality is never given to individuals but is constantly constructed and modified by the social actors as a result of their interactions.

This movement is characterized by its pragmatism, its methodical field work and the will to understand

social order and disorders in order to resolve them by the work of social workers guided by sociologists[2]. (Durand & Weil, 1990, p.168)

With Bateson and the Palo Alto School, the systemic approach to human relationships combined with an interactionist perspective aiming at modeling social interactions within their contexts. A general theory of communication eventually emerged:

In their opinion, any single interaction is so complex that it cannot be reduced to two or more variables interacting in a linear fashion. Research on communication must be conceived as a variety of levels of complexity, of multiple contexts and of circular systems[3]. (Winkin Y., 1981, p.25)

Toward a Combined Approach to Learning

Our intention in this book is to consider how this dual perspective, drawing on systemics as well as interactionist theories, can help us describe and better understand the interactions at work in distance language learning environments.

Considering communication as a social process makes it possible to extend the principles regulating communicative situations to all interactions and behaviors involved. Adopting this dual perspective is a way to tackle the complexity of computer-mediated and distance language learning situations. These can indeed be conceived in this light as the articulation between didactic and pedagogic situations interacting within the complex system of a learning environment.

An ergonomic approach focusing on interaction and communication seems to us to offer a promising way to account for the complexity of the field under investigation.

DEFINITION OF DIDACTIC ERGONOMICS

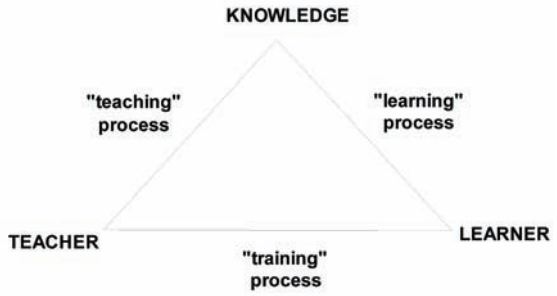
No single theory of language learning has been accepted as satisfactorily accounting for the mental processes on which didactic theory is grounded. At the same time, the pace of technological innovation has been increasing significantly in the last two decades. This change has dramatically modified our modern world which must reconsider its organization modes, its means of production, and its mental models. It has also led political thinkers to imagine new social systems in which human, social, and economic relationships integrate the technological dimension.

Teachers have been used to the intrusion of technology into pedagogy, especially since the advent of the first language laboratories and the subsequent video equipment, which paved the way for the audiovisual methodology. They naturally placed much hope in the interactivity and the communicative capacities of the more recent computer technology: never before had there been such rich potential for pedagogic (r)evolution. Much disappointment however has pointed out the necessity to think about new ways to combine human expertise and technological potential.

At the same time, researchers have warned against unreasoned integration of Information and Communication Technology (ICT) in the classroom (the 'gadget' trend) and the lack of epistemological distance due to the very short history of CALL, as well as to the fast pace of innovation. While experiments and developments multiply, relatively little attention is paid to either their initial link to theory or to validation studies.

The time seems ripe to move away from innovation for innovation's sake and to analyze how technology can offer durable and efficient solutions to specific pedagogic issues. Didactic ergonomics has sprung up from this need to examine how artifacts can be used to instrument the language learning situation, thus integrating didactic thinking into the field of ergonomics.

Figure 1. (adapted from Houssaye 1988)



Initially associated with industrial production, ergonomics focuses on the nature of Human-Machine interactions in order to adapt a given process to man. Its objective is two-fold: optimizing system performance as well as human well-being. De Montmollin (1996, p. 189) adds that an ergonomicist is neither a psychologist nor a sociologist; he should not only observe and interpret but also solve practical problems of design and improvement. The ergonomic perspective is clearly in line with didactics, since both require observation and analysis as a means to improve a process – production or learning. Distinctions however will have to be specified as we consider these two fields more in detail.

Models of Language Learning: A Selective Review

Original models of the learning situation are mostly based on three basic components which form the three poles of a triangle, whose interpretation varies significantly however according to authors, each putting a specific stress on a particular perspective.

Houssaye's Pedagogic Triangle

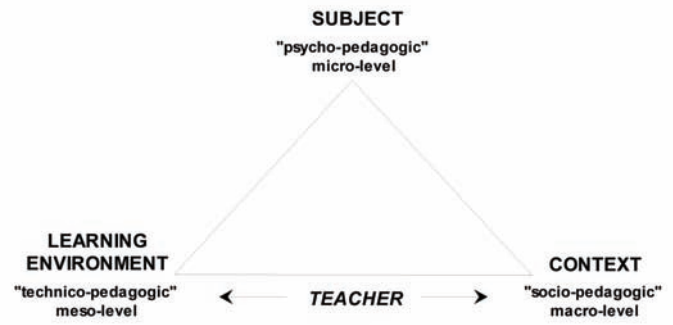
Houssaye's famous "pedagogic triangle" (Houssaye, 1988), structured around knowledge, teacher, and learner, points to three distinct processes relying on the principle of the "excluded third": whichever process is stressed necessarily leaves the third element in the background (Figure 1).

Houssaye explains his model as follows:

- In the teaching process, defined by the teacher-knowledge relationship, the teacher is the holder of a knowledge which he is supposed to convey to the (passive) learner. This traditional transmission-based perspective leaves out individual skills and strategies of the learner.
- In the learning process, the teacher's role is limited to creating conditions likely to favour the knowledge-learner relationship. There is no simple transmission in this case as the learners have to acquire the knowledge themselves.
- In the training process (teacher-learner relationship), the teacher stresses the individual characteristics of the leaner without considering him an actor.

While this model does not seem to focus on the learner himself, its interest lies in the fact that, according to the perspective one retains, the nature of the excluded third entails major consequences on the overall structure of the learning environment. Epistemologically, it is important to note that in Houssaye's model, each process is considered what Bachelard used to call a "real object", i.e. which can be constructed out of existing theories. Teaching is a series of social acts in which the teacher has no real cognitive function: it includes designing environments and systems, following up learners and designing learning tasks. Learning is an individual cognitive act determined by nativization (chapter 4) requiring some kind of mediation to allow the denativization process to take place. Training includes the two notions of mediation and tutoring.

Figure 2. (adapted from Carré et al., 1997)



Carré et al.'s Model

Carré et al. (1997) distinguish three levels within the pedagogic situation (Figure 2):

- The micro (psycho-pedagogic) level defines what they refer to as the "subject" and includes any relevant information on the learner (e.g. learning and acquisition theories, etc.).
- The meso (technico-pedagogic) level includes all the human actors involved in the social relationship formerly alluded to by Houssaye (teacher, tutor, peers) as well as the learning tools, materials and aids.
- The macro (socio-pedagogic) level produces an innovation as it takes into account the whole learning environment (local as well as political context and institutions).

What is left out of this model is the actual place of the teacher, whom we added in this representation, torn between context and the learning environment. This position announces the tension between theoretical and pragmatic approaches encompassing context. This comprehensive pragmatic approach involves the need for didacticians to call on education sociologists and economists and to analyze decision-making processes in order to define the various actors' roles more clearly.

Legendre's Model

An interesting evolution on the initial triangular models was brought by Legendre (1988) in the form of the integration of the traditional triangle within an identified context (Figure 3). Although context does not here constitute a pole in the model, the number of elements introduced by Legendre points to a more complex concept of mediation since context conditions in varying degrees all the interactions and processes present in the learning situation.

Another significant evolution lies in the association of language and culture which enlarges the scope and the nature of this teaching/learning "object". We should however note the ambiguity of such an "object" which could easily be understood as meaning that the language system described by linguists could exist independently from or even precede discourse. While we should bear in mind Richterich & Widdowson (1981)'s distinction between linguistic and pedagogic descriptions of language – or, in a more recent perspective 'pragmatic' descriptions – it seems essential to remember that only the second, based on real-life discourse, can form an acceptable ground for language learning/teaching.

Figure 3. (adapted from Legendre, 1988)

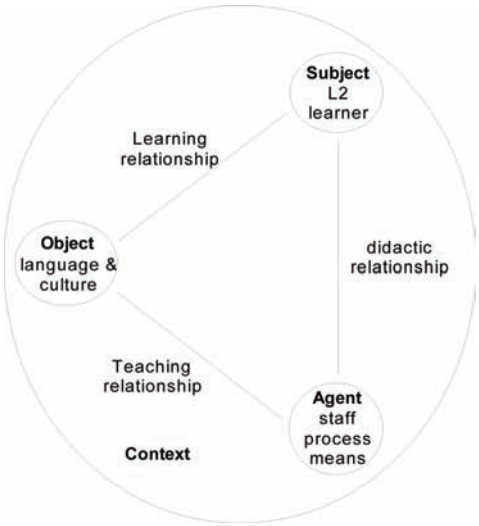
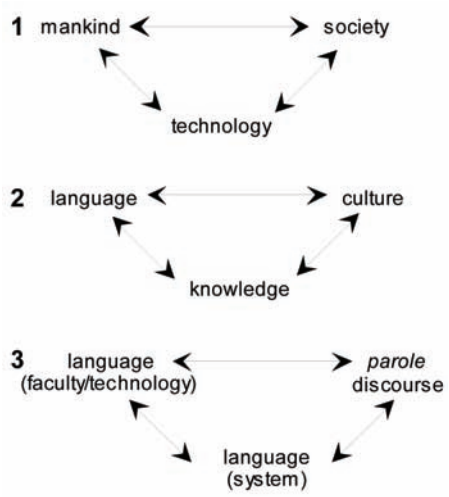


Figure 4. Three transductive relationships (adapted from Narcy-Combes, 2005)



Narcy-Combes's Transductive Relationships

Our assumption, already developed in (Narcy-Combes J.-P., 2005, pp. 37-41) is that a didactic perspective of language is centered on three transductive relationships, i.e. whose terms cannot be separated and are to be accepted as a whole.

The first of these relationships (Figure 4) is borrowed from Simondon (1989) who takes it for granted that language can be understood as a human technology (Auroux, 2001) and as such, is inseparable from mankind and society.

This relationship points to the necessity to enlarge the scope of the didactic field from a mere "language" object to a wider association of culture and language as shown in the second transductive relationship. The third transductive relationship offers an answer to the debate about the nature of language (human faculty or technology?) as it is implemented in *parole*/discourse and later described as a system by linguists: none of these visions are effective on its own for language learning purposes and all three should be accepted together.

Present technologies make it possible to record 'parole'/discourse more accurately than before. Any proposal of systemic description will necessarily remain an approximation of reality (i.e. the internal cognitive organization) since access to discourse does not mean access to this internal cognitive organization which makes utterances possible. (Narcy-Combes J.-P., 2005, p. 40)[4]

Refusal of systemic description as the basis for language learning can be justified by the fact that descriptions can be useful only from the moment when the learner starts wondering about how discourse functions. Providing answers before questions are raised might indeed prove problematic. What appears to be central to didactic thinking is the identification of language users' actual needs for a given communicative situation.

The Learning Cycle

Anticipating Part 2, let us simply say at this point that our approach suggests the existence of a possible "language learning cycle" (Figure 5) based on a wider notion of language as we have

outlined, which could form acceptable grounds for didactic reasoning.

The interest of this cyclic model is two-fold: it first shows how realistic and collaborative macro-tasks, which R. Ellis (2003) referred to as "real-life activities", can be expected to reveal language and communication gaps which appropriate language-oriented micro-tasks would be expected to fill. It also suggests that it is possible to combine sociocultural (Bruner, Vygotski) and cognitive theories within an apparently coherent cycle. A detailed discussion of this model will be developed in later pages.

Each of the models of (language) learning we have described so far points to a specific interpretation and cannot not offer a comprehensive representation of the situation: their variety points to the need to widen horizons and to accept Morin & Lemoigne (1999)'s conception of complex thought, whereby specific elements of knowledge must be related the one with the other, leaving room for uncertainty and flexibility.

Ergonomics: A General Approach

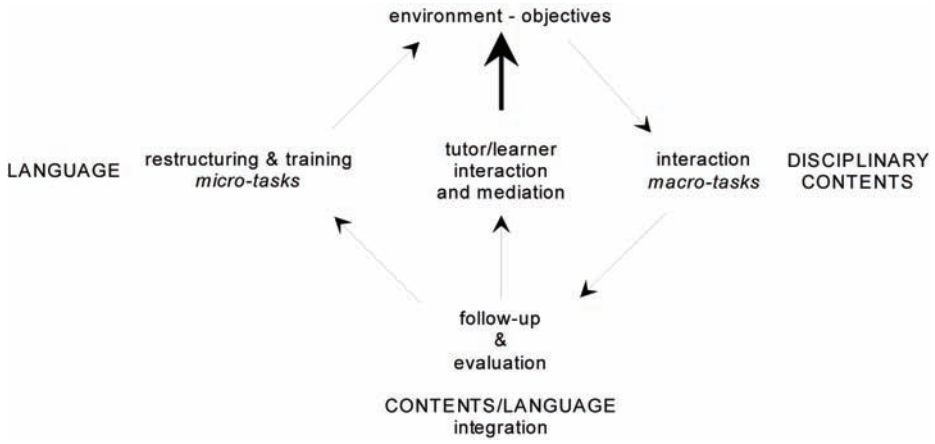
Laville (1976, p. 5) suggests an interesting definition of 'ergonomics' as a combination of science, technology and art. As a science, its object is the study of man in his work environment. As a technology, it organizes various fields and disciplines in order to design tools and means of production. As an art, it consists in using available knowledge to transform a given reality or design a new reality. As such, it found its origin in the world of industrial production and in technology-aided activities. More generally, ergonomics concerns a variety of fields including physical work spaces (offices, production lines, etc.), production processes, work organization schemes (working hours, organization of a firm's departments, etc.).

For Sperandio (1980, p. 14), ergonomics feeds mainly on five sciences: psychology, physiology, sociology, medical sciences and engineering. While one of these sciences may play a dominant part in certain contexts, Sperandio considers they all necessarily contribute to ergonomics.

According to Raby et al (2003), European ergonomics is mainly characterized by its anthropocentric perspective while American ergonomicists tend to develop a more technocentric approach:

The European school sees ergonomics as the analysis of the activity operators carrying out tasks in the field. Generally speaking, the American school is preoccupied with designing the best possible instruments or programs. (Raby et al, 2003, p. 71)

Figure 5. The learning cycle (adapted Narcy-Combes, J.-P., 2005)



However, she adds that this original difference is getting blurred as a new tendency emerges and,

the human factors trend (is) more and more interested in the sphere of usage and the European school in the sphere of design. (Raby et al, 2003, p. 71)

Work analysis may be carried out in the researcher's laboratory as well as in field work situations. Ergonomic activity may take place either at design level (activity analysis) or during work (correction analysis) (Laville, 1976).

The methods developed in ergonomics are close to those used in the field of training engineering, which explains why they all find a natural place in the present book (see chapters 8 and 10).

They are based on two main principles. The first principle is that the operator/actor/subject regulates his/her activity in relation to the immediate environment, and his/her own physical or affective state, to optimize performance. The second principle is the focus on the notions of compromise and negotiation in order to balance the expectations of performance against the constraints of the environment. R. Amalberti (2005) refers to this process as the *cognitive compromise*, also influenced by the psychological aspects of the activity (stress, fear, emotions, etc.). For this reason, Amalberti thinks that field observation is a necessary phase of ergonomic analysis. We will see in later chapters that in the application of this concept to the field of language learning leads to the claim for the involvement of teachers and learners (and possibly all other actors – chapter 8) in action-research activities.

While ergonomics then deals with the efficient organization of the relationships between man and his environment, and more specifically with the technologies he develops, the function of ergonomic models of Human-Machine systems varies significantly according to their original perspectives:

- technology-driven approaches aim at improving the instrument in order to increase its efficiency;
- sociological approaches consider the relationships between the instrument, its users and their environment;
- psychological approaches try to identify the more 'intimate' relationships between these partners.

The general picture which appears irrespective of the approach is a system where a complex process of mutual adaptations is at work. Its final objective is the optimal completion of the task. Whether we consider it from the cognitive sciences perspective or from that of industrial production, the task can be defined as *a **goal** to be reached within a given **environment** by means of **actions** or **operations*** (Tricot et Nanard, 1998, p. 37[5]). Ergonomics will focus more especially on the definition of goals, environments, and actions before considering how to support instrument appropriation by the users.

Toward an Ergonomic Model of Language Learning

If one accepts that the pedagogic relation focuses on the learner, there remains to understand how the other components of the situation can be organized coherently so that the learner-centered process will be facilitated. Another question is raised because the absence in any one of the former models of a technological pole: how should the instrumental (process-oriented) nature of technology be defined in relation to the human actors (the users)? Both these questions pave the way for an ergonomic approach.

To build up an ergonomic representation of the CALL situation, we will first review a few models drawn from fields and disciplines external to didactics.

In spite of its close relation to technology, an ergonomic approach to language learning

and didactics is no heresy and is clearly distinct from a technology-centered approach supporting a fantasy vision of the machine supposed to replace man. Although the initial models of language learning stressed an essentially human relationship (teacher-language-learner), one should bear in mind that the essence of didactics is to favor language appropriation. Integrating now conventional technologies such as manuals, pictures or video clips has long formed an integral part of this field and has given a new dimension to a pedagogic situation traditionally restricted to human exchanges (Figure 6).

Computer technology constitutes an innovation only insofar as its interactive nature differs significantly from the more passive or linear former technologies. Obvious as this remark may seem, its consequences have passed unnoticed in a number of cases and may well explain teachers' many disillusions.

The didactic ergonomics approach is a response to the new environment created by digital multimedia technology and an attempt to extend former perspectives and to address the new questions raised by the various forms of computer technology.

While the general concern of didactic research has been to improve language learning, CALL sociologists have noted a side-effect tempering the sometimes unreasoned hopes placed on technology. Whatever form computer technology takes, it turns out to widen the gap among learners (Lancien, 1999), notably due to social inequalities in access to computers (Tucker, 1999). A didactic ergonomic perspective could therefore be defined as the study of the conditions for the integration of technologies within learning environments by the teachers who choose to use them as well as by the learners for whom they are designed.

The question remains of whether or not the computer provides enough innovation to slight the elitist bias of previous technologies. Another question would be to establish sound bases to its reasoned integration, taking into account its specific features, those of its users (teachers, learners… and institutions) and a clearly identified process (second language acquisition). The issue is two-fold. It first concerns the form of materials and software: how to make them user-friendly in order for technology to disappear behind the didactic function? This first concern belongs to the field of functional ergonomics which has been largely neglected until very recently by computer experts little prone to share their power. If some progress can indeed be noticed, design and development of innovative CALL environments still require relatively high skills from their users. But the problem also lies in the actual pedagogic function attributed to technology. If one considers the relatively short history of the computer, its integration into the field of language learning has most commonly been synonymous with a process of mere transposition of the former technologies into the new one. The initial "educational softwares" were most often supposed to take a place similar to that of the paper-based exercise book even though their more dynamic nature opened a few new horizons. How many of today's multimedia or Web-based materials are built on really innovative grounds? How many authors and publishers take the necessary time to study the pedagogic potential of a radically original technology? How

Figure 6. The traditional pedagogic exchange

many teachers resort to multimedia after careful planning of its integration within the curricula and their institutions?

These three questions lie at the basis of the didactic ergonomics approach which will be presented in more detail by reference to the general world of ergonomics on the one hand and to the adaptation of the concept to the field of language learning on the other hand.

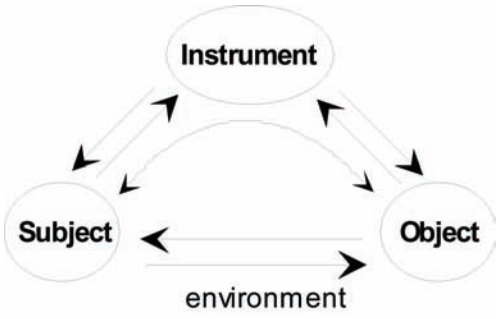
Reviewing a Few Ergonomic Models

The common point between the various perspectives to be found in the field of ergonomics lies in the fact that most models are originally drawn from the world of industrial production: computer-assisted design or production, assistance to complex procedures (e.g. aircraft flying, etc.). These models furthermore focus on three characteristic features of what Rabardel (1995) called the Instrumented Activities Situation:

- the subject (the user of the instrument);
- the instrument (the tool, the machine, the system, etc.);
- the object (the product, i.e. the process on which the action focuses).

The triangular model introduced by Rabardel & Verillon (1985) makes a distinction between the three poles of the action on the one hand and a set of multiple and complex interactions between the poles on the other hand (Figure 7).

Figure 7. The Instrumented Activities Situation model (adapted from Rabardel & Vérillon, 1985)



Due to the instrumentation of the process, the traditional interactions between subject and object are modified and complemented by new indirect subject-instrument and instrument-object interactions.

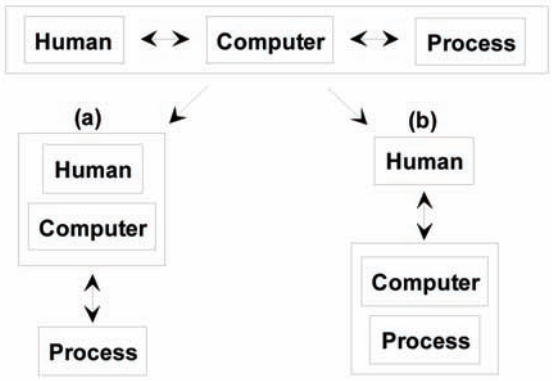
This model should be matched with another three-pole diagram being drawn from the field of process control: Hollnagel (1990) establishes a distinction between two separate types of interactions that depend on associations within the process itself (Figure 8):

- Using the computer to provide data on the process and 'amplify' some of the user's cognitive functions; computer and operator are then closely related in the system design (a).
- Using the computer to analyze the communication between the operator and the system; in this case, the operator has only little control over the computer-mediator whose function is assimilated to that of a prosthesis (b) (in Rabardel, 1995, p. 75).

The advantage of such a triadic representation lies in its flexibility to meet different disciplines. Rabardel adds that as an instrument for dialogue, it is a useful tool even if it has to be refined to match the specificity of the language learning situation. These two models also raise a number of related issues: how to define precisely the process for which the computer is used, how to define the poles around which the process is organized, how to identify and define the interactions between these poles? Answering these questions will help characterize the function of the computer for language learning and suggest general principles for setting up CALL environments.

Three main perspectives can be outlined when designing Human-Machine systems:

Figure 8. Hollnagel's triadic model (adapted from Hollnagel, 1990)



- A technocentric approach that tends to reduce man's place in favor of the machine: *man occupies a residual place and his activity being deprived of any proper status, it can most often be thought only in the same terms as the technical process*[6]. This perspective implies the possibility of identifying every single step (the algorithm) of the process.
- An anthropocentric approach whereby man *occupies a central place from which all relationships to techniques, machines and systems are thought. This option places human activity at the center of analysis and makes it possible to operate the necessary reversal and refer to things in relation to men*[7]…
- Without totally rejecting any of these, Rabardel points out their limits and recommends combining them into what he refers to as an anthropotechnological approach:

none of these two standpoints is acceptable on its own. The technocentric approach tends to place man in a residual position which prevents him from actually thinking out his activity, while the purely anthropocentric perspective is unable to conceive the specificities of technical systems. [The answer lies in] their conceptual as well as pragmatic articulation on which the design of a production system is based, from a technological point of view and from the point of view of human activity[8] *(Rabardel, 1995, p. 20).*

Historically, Human-Machine relationships seem to have moved away from the initial dichotomy between man (decider) and machine (action) to systems based on a more passive man and a more active machine. Cooley (1989) explains such a reversal of the original paradigm by a *perspective driven by the three essential features of exact sciences (predictability, repetition and mathematical quantification) which tend to exclude intuition, subjective judgement, implicit knowledge, imagination and intention*[9] (cited in Rabardel, 1995, p. 29). In this technocentric approach, the role of the machine is to restrain atypical human operations. A major drawback raised by this approach for our purpose is due to the elimination of the human element which modern didactics precisely emphasizes. Standardizing all operations and systems so that they could be machine-controlled would mean standardizing both human beings and processes.

A more recent evolution has led ergonomics from a focus on human "properties" to a focus on human activities before eventually considering the activity's cognitive dimension. A salient feature of modern ergonomics mentioned by Rabardel can be summed up as follows: *artifacts should not be*

used as things but as they mediate use[10] (1995, p. 51). This leads us to the idea that artifacts should be analyzed both within the time-span of their creation (cultural aspect) and within the contexts for which they were originally created and in which they are used (functional aspect).

The anthropotechnological approach therefore is based on objects and systems designed in relation to a human environment. If *thought is shaped by tools* (Payne, 1991 cited by Rabardel, 1995, p. 52), then cognitive processes are closely linked to the tools and technologies used to represent, transmit or construct knowledge. While this idea significantly impacts the conditions for CALL systems design, what remains to be considered is how the 'object-oriented' industrial ergonomics models can be adapted to the field of didactics and how 'process', 'subject' and 'object' can be specified, together with 'goal', 'instrument' and 'action'.

Modeling the CALL Situation

An important difference between industrial and educational environments lies in the fact that in the former, the artifact is normally created to meet the specific needs of the process while in the latter the artifact is pre-existent to the process. This entails major consequences on the design of the learning environment system since adequacy between process and artifact is no longer natural. It becomes necessary to consider the following options:

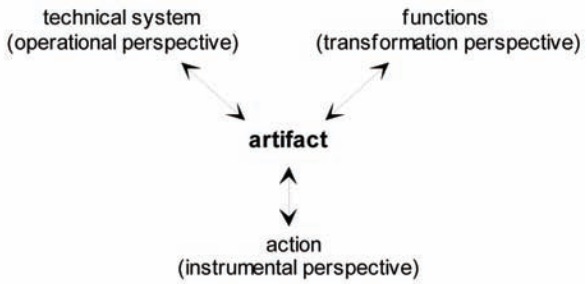
- adapting the artifact to the situation to give it the required instrumental function;
- adapting the process to the artifact so that the latter's predefined functions partially or wholly facilitate the global process;
- adapting both the artifact and the process so that each can find its complement in the other.

If any one of these options can be acceptable, there still remains the idea of making sure that the artifact can indeed be considered appropriate for the given process. Commercial advertising campaigns too often result in the omission of this major question.

Furthermore, the artifact can be characterized by its three-fold nature which entails as many possible perspectives whose combination determines its efficiency for the process (Figure 9).

- As a technical system, the artifact has its own operating specifications. The degree of coherence – or the absence of coherence – between these specifications and the nature of the process determines the conditions of total or partial integration of the artifact into the system, or even its total rejection.
- A technical system is also characterized by a number of available functions which influence its potential integration. Their number and nature will govern the place of the instrument.

Figure 9. The three-fold nature of the artifact



- As a tool for action, the artifact is related both to its user and the final objective and this relationship determines the completion of the task. The most refined artifact cannot perform the expected task if its integration has not been properly thought out.

To a certain extent, language learning can be compared to the industrial situation as they both focus on a transformation process, in our case the transformation of a human being who acquires and assimilates new knowledge and skills. In the same way, the two situations involve human actors (teacher and learner) and an object (language). This elementary description has given rise to the triadic models that we have outlined in earlier pages and which Michel Perrin characterized as follows:

the triangle is (…) firmly established on its base, the learner, who is actively engaged in taking in from teacher expertise and language material alike, when and as he/she needs it, the kind of information that will allow language appropriation to take place. (Perrin, 1990, p. 20)

Technology should in no way affect the balance of this triangle and should therefore appear as a centre of gravity around which the process is organized:

this representation respects the idea that the didactic process is neither dominated by the teacher, nor by the target language, nor even by the instrument, in which case the learner would be in danger of being 'submitted constantly to more or less passive input, causing the triangular structure to tip towards either the dogmatic side of the teacher or the systematic side of the language' (Perrin, 1990, p. 20)… to which we could also add… 'or to the technological side of the computer'[11]*. (Bertin, 2000, p. 46)*

A possible answer to this question might derive from the technocentric approach by simply replacing the human teacher by the computer, as represented in Figure 10.

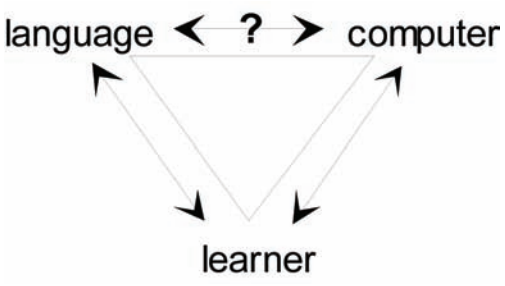
This first model of integration (substitution, rather) can be found in a diachronic as well as a synchronic description of the CALL situation:

- Diachronic perspective: the model corresponds to the initial attempts at relieving the teacher from a number of repetitive or 'mechanistic' tasks. Original "computer-based instruction" was thus mostly justified.
- Synchronic perspective: a significant number of present ICT applications are basically grounded in the free access to information offered by databases, hypermedia or Internet-based materials.

What the model does not show, probably for lack of attention given these issues, is the nature of the relationships between language and the computer. What type of language is presented, how is it pedagogically organized or to what extent, who organizes or mediates the language-learner interactions, and who organizes/ monitors the learning process…?

What gradually appears is the inadequacy of the traditional triadic model to account for the more complex CALL situation; by inevitably leaving out one component, it can only offer partial representations and introduce biases into its possible

Figure 10. The technocentric triangle



interpretations. Rabardel (1995, p. 77) advocates the passage to a four-pole model which could better account for the new situations linked to collective (cooperative or collaborative) work as well as for the focus on computer-mediated systems aiming at facilitating group work ('groupwares'), as shown in Figure 11.

The central (i.e. intermediate) position of the instrument clearly pointing to its mediating function constitutes an important asset of this model, even though Rabardel here does not radically change the philosophy underlying the former triadic models. Indeed in his Instrumented Collective Activities Situations, the whole Human-Machine system is organized in one single direction: the collective achievement of the task. His distinction between "subject" and "other subjects" is essentially based on a shift of the individual's point of view within a given work organization: each subject remains on a similar level to the others by participating, each in his/her own way, in the common task. It could be tempting, but misleading, to replace these actors by "teacher" and "learner" since in the CALL situation, the relation of each of these actors to the task is indeed very different.

In the didactic model, the goal is not to be understood as the achievement of a common task but as the facilitation by the teacher of the learner's individual work. As distinct from Rabardel's model, "teacher" and "learner" are situated on opposite sides of the instrument: their relationship is no longer a mere collaboration. Another distinction has to be made between "subject" and "object": the object of the process is the learner's transformation (his acquisition of a second language). As the learner interacts with the language through the computer, he becomes at the same time subject and object of a reflective process, which explains the two-directional arrow in Figure 12.

The teacher is defined as one of the actors of the process, to an extent that still remains to be defined. The language pole constitutes another focal point of the process. Another difference with industrial ergonomics lies in the fact that in the industrial perspective, the process corresponds to an identifiable sequence of operations: the algorithm. In the case of language learning, as will be highlighted in part 2, algorithmics is replaced with heuristics, thus preventing any attempt at standardizing the process.

This, as yet, unrefined version of an ergonomic model of the CALL situation clearly points out to the humanistic philosophy on which education should rely: as opposed to technocentric approaches that make the computer the focal point of the process. This representation emphasizes its mediating function between human actors and their communication tool (language).

Figure 11. Four-pole model of Instrumented Collective Activities Situations (from Rabardel, 1995)

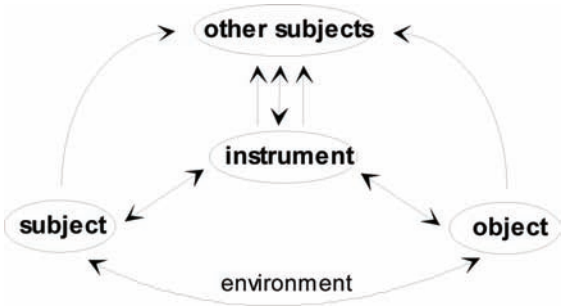
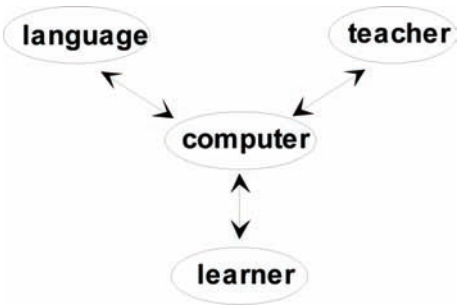


Figure 12. Adaptation of the four-pole model to the CALL situation (from Bertin, 2001a, p. 75)



Poles and Interactions: Identifying the System

This elementary model calls for two levels of interpretation. The first level, figured above, consists in identifying the components and their interactions, as described in the systemic and interactionist approach previously described. The main question concerns the way the new computer mediation impacts the various interactions present in the former triadic models. This actor-centered functional perspective should be further complemented by a second level involving the theoretical references defining each pole of the model and organizing their relationships.

To stay in line with the theoretical stance we have outlined, two sets of theories have to be identified whose nature will determine the materials design process:

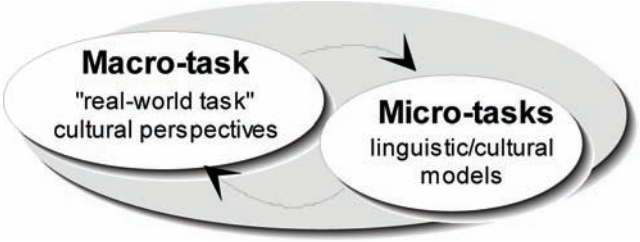
- Theories determining the models of language/culture retained: CALL evolution has so far been characterized by a move away from a systemic perspective (linguistic models) to a more pragmatic one based on sociolinguistics and pragmatics. Their technological translation could be illustrated by the initial 'exercisers' or computer drills focusing on specific vocabulary or grammar learning on the one hand, and by the more recent Computer Mediated Communication (CMC) technology, for example, for 'real-life' interaction on the other hand. This set of theories is goal-oriented.
- Theories determining the type of activity to be presented on the computer screen and/or which requires the use of the computer. These theories define the 'teacher' pole of the model and contribute to specify the type of teacher mediation as well as the form of the computer-based activities. This type of theory is both process- and teacher-oriented.
- Theories determining the type of learner interaction with the language as well as with the computer environment. Belonging to the field of second language learning and acquisition (SLA), they define the 'learner' pole of the model. This type of theory is both process- and learner-oriented.

Here we notice that although both are process-oriented, the last two sets of theories address the learning process from very different angles, thus illustrating the specificity of didactic ergonomics, as distinct from Rabardel's industrial ergonomics model.

The three poles thus defined combine to give shape to the first level of language learning materials, based on Narcy-Combes' learning cycle, and constituting some form of prerequisite for potential computer mediation (Figure 13).

This sequential planning of the CALL situation follows the anthropotechnological perspective we have outlined, insofar as it places technology-relat-

Figure 13. Model of language learning materials



ed questions in a subordinate position to didactic concerns. In our case, the question becomes: once the model is established, what possible forms can computer mediation take? Asking the question in this way clearly shows that there can be no one single answer, no 'one best way'. The systemic approach leads us first to analyze each initial state of the poles of the model, then to deduce the 'various best ways' to reach the final goal.

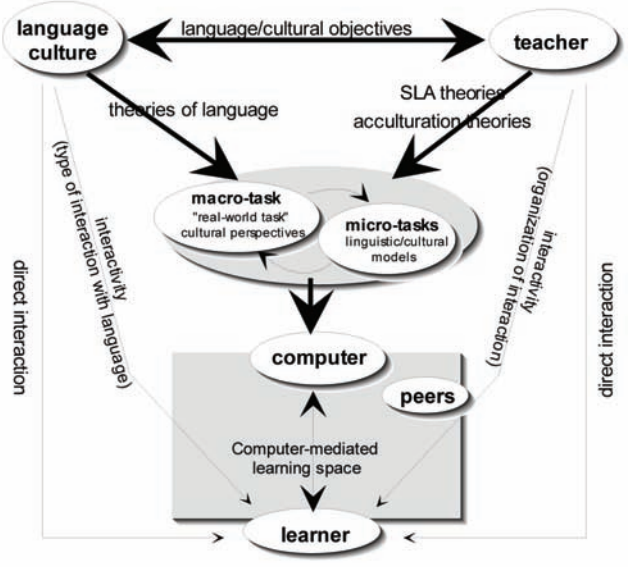
The didactic ergonomics model therefore evolves towards a more elaborate representation (Figure 14).

Another consequence of the subordination of technological mediation to didactic intention is the impossibility of defining precisely the technological component of the model. The absence of theoretical determination of the "computer" pole (see chapter 7), largely due to the rapid pace of innovation, gives the model both its dynamic dimension (the presence of the computer should be understood as an incentive to question all other interactions) and its flexibility (technological innovation constantly makes it necessary to reconsider the possible forms of pedagogic mediation at all levels of the model).

From a technological point of view, computer mediation is defined as "interactivity" which shapes both the type of learner interaction with the language (learner-computer-language) and its organization (teacher-computer-language).

At this point, a distinction should be made between the notions of 'interactivity' and 'interaction'. If the former is inherent to the computer, the latter may give rise to a second level of learner-language and learner-teacher relationships. For example, such is the case when the learner interacts verbally in the classroom (in the case of face-to-face learning situations) or outside the institution for non-learning purposes (as when watching a film or chatting with foreign friends) and again when direct contact is made between teacher and learner (as for advice, guidance, explanations, etc.). Such interactions give rise to what is sometimes referred to as 'incidental learning', justifying their presence in the model. This external level of interactions stems from our anthropotechnological perspective in which the computer's place remains subservient to the human actors and the teacher fully retains his original role as a mediator.

Figure 14. Didactic ergonomics model – step 2



From a didactic ergonomics perspective, this dual network of interactions is essential to keep the necessary balance and cohesion of the system. As opposed to the industrial situation which seeks to avoid functional redundancy (*do not repeat the same operation twice*), the instrumentation of the CALL situation aims at reinforcing as well as enriching the learning situation. The old 'learning machine' phantasm is now obsolete. It has become generally acknowledged that didactic innovation (as opposed to technological innovation – see chapter 7) entails the reversal of the original paradigm [computer ⇔ technology ⇔ pedagogy] and complexifies a field of study which explicitly belongs to human sciences (Rouet, 1998).

Furthermore, the structure of the model clearly points out to the co-existence of two distinct spaces within the CALL situation:

- the computer-mediated 'learning space', including the virtual space displayed on the screen and the set of relationships mediated by the computer;
- the general setting in which learning takes place, which includes both the computer-mediated environment and the direct (i.e. not mediated) interactions between the three original poles of the language learning situation (outer arrows in Figure 14). This global 'learning environment' (for which French has a specific word - *dispositif*) directly results from the didactic intention of the teacher and/or institution.

C. Montandon explicitly associates the learning environment (*dispositif*) with a clearly systemic vision, whatever the theoretical stance taken:

In a behaviorist model (...) the environment is given a technical meaning, that of an instrument serving predefined objectives, independent of the future actors who will use it as a tool for gradual learning. The sociocultural model of interactive group pedagogy refuses to consider the environment as a mere technical, neutral, static and instituted object and postulates that the actors and their objectives form an integral part of the environment; it denounces a technical perspective and advocates a systemic perspective. It refuses a technocentric and reductionist perspective that deconstructs and separates the various stages of the learning process without paying attention to the retroactions, the significance of the interactions between the learners and the task as well as the inevitable adjustments when teachers take into account the feedback from such interactions. Considering the environment as a system then implies an evolving and dynamic vision of the environment.[12]*. (Montandon, 2002, p. 12)*

This dual structure reveals the underlying assumption that from a humanistic point of view, a language learning environment reproducing the theoretical stance we have taken should be of a 'hybrid' or 'blended' nature in order to preserve some room for natural contact and communication. It also implies that mediation will not necessarily take the same form for the whole situation, but will vary according to the 'moments' (functional aspect) and 'places' (structural aspect) of the learning process.

An ergonomic approach to CALL will necessarily involve a reflexion on the objectives and contents (teacher ⇔ language relationship), on the organization of learner interaction with language within the whole learning environment (teacher ⇔ learner relationship) and on the type of interaction expected (learner ⇔ language relationship). The efficiency of instrumentation depends on the capacity of the computer (or of its applications) to fulfill its pedagogic function (artifact ⇔ instrument relationship). This efficiency should be measured against the cognitive relationship (learner ⇔ computer) which constitutes the essence of the process.

The distinction of this model with former triadic or industrial four-pole models creates an original

situation, all the more so as a number of new questions emerge from this initial description:

- the simultaneous use of the same instrument by different users (learners and teacher) suggests a variety of representations and possible uses. Individual representations of the original artifact will have to evolve and converge in order for the learning process to take place;
- the presence of two human poles in the model implies the coexistence of two subjects and the appearance of two distinct relationships to the computer, whose nature will have to be identified.

We should also note that at this point the model we are suggesting can at the same time fulfill a global language acquisition function and a more punctual or specific objective for which the computer represents a significant added value.

Deconstructing the Model: System and Sub-Systems

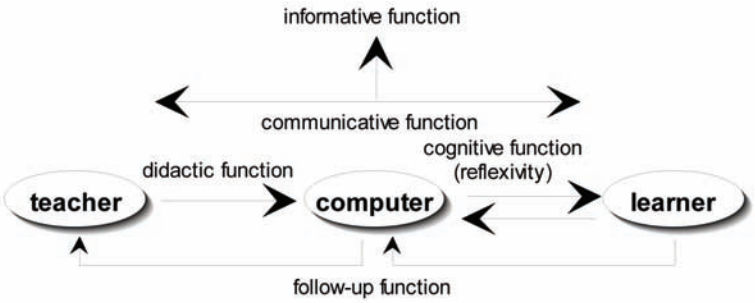
Constructing an interactionist model of a human activity situation is a difficult task as it tends to generate complex representations. It is worth remembering however that complexity is different from complication. While complication is linked to the notion of perception and apprehension, complexity is related to the number of elements to be taken into account in order to describe and operate a process. In the case of an organized system, complexity arises from the difficulty to describe it fully or to infer its organization from the observation of its parts (Melèze, 1972, pp. 50-51).

In the still unrefined model presented in Figure 14, complexity is enhanced especially because of the number and the specific nature of its individual components:

- the definition of language as the resultant of the three transductive relationships described earlier;
- the evolving nature of the teacher's role as expert, tutor, materials designer, etc.;
- the presence of peers in the virtual learning space as well as in the larger learning environment - previous studies have shown how 'virtual peers' play a more significant role than originally expected, especially in the distance learning context (e.g. Belisle & Linard 1996, Bertin et al., 2005), hence their addition into the model.
- the multifunctional nature of the computer itself, as illustrated in Figure 15.

Several main functions can indeed be identified for the computer, each available to both and/or either the teacher and the learner, which further emphasizes the originality of the CALL situation:

Figure 15. The computer - a multifunction instrument



- The didactic function (i.e. teacher-centered) makes it possible to plan the integration of the technology and reformulate traditional teaching in accordance with the specific features of the computer. It is especially linked with didactic/pedagogic engineering and materials design.
- The cognitive function (i.e. learner-centered) is a mirror image of the previous one and determines the learner's access and interaction with input language. This function is a reflective one since it draws on technical interactivity to develop cognitive interaction on the part of the learner.
- The communicative function is based on the capacity of the computer to allow communication to take place between the participants in the process. It is at least partially related to the cognitive function as it provides further input for the learner and contributes to shape his/her representation of the language: *thought is shaped by tools* (Payne 1991).
- The informative function corresponds to the information searching facilities and is closely associated with the communicative function.
- The follow-up function forms an essential element of a system as it makes monitoring, retroaction, and control possible.

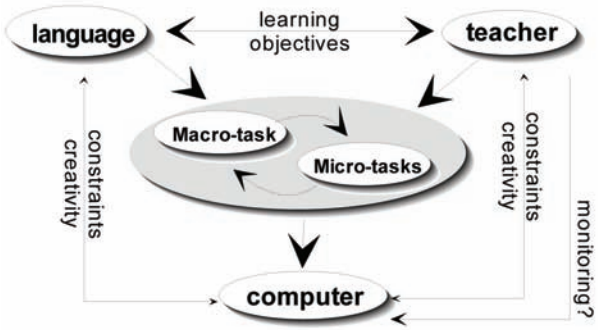
This functional description of the CALL system naturally leads us to a structural analysis (i.e. spatial organization) of our model. If we consider the various flows of information, it becomes possible to identify a number of interacting sub-systems each of which requiring specific planning and organization of the didactic mediation process.

The top part of Figure 14 corresponds to the learning environment/space design and materials design phase. It is teacher-centered and is based on the didactic function of the instrument (Figure 16). This sub-system is delineated by three poles: the teacher defines the learning objectives in relation with the many-fold nature of language as well as with institutional context and organizes a learning environment in which the learner will move with a varying degree of autonomy/guidance; the computer generates a number of constraints for input language (what aspects of language can actually be reproduced by the computer?) and as well as for didactic activities (does technology allow any type of activity likely to favor language acquisition?).

At the same time, technological innovation may trigger the teacher/designer's creativity to enrich the array of available pedagogical tools. The balance between these various factors determines the degree of real pedagogic innovation.

The lower base of this sub-system interacts with the learner-centered sub-system, insofar as

Figure 16. Sub-system 1 (teacher-centered)



it determines the conditions of learner cognitive interaction with the computer. We should however bear in mind that this interaction is not chronologically linear in the case of distance learning especially, since planning and design do not immediately precede the actual learning phase. The existence of this asynchronous interaction makes the materials design phase more complex as no immediate human retroaction and feedback can take place and significant differences may then appear between didactic intention and actual learner practice.

This interaction between the two sub-systems also points to the need of planning both the function(s) and the technical modes of monitoring learner activity.

The second sub-system is therefore logically learner-centered and corresponds to the learning situation (Figure 17).

The basic principle of this sub-system remains relatively simple, even though its mechanism and implementation are complex. The computer provides (task-centered) input with which the learner interacts alone and/or in relation with his peers and possibly the teacher. A distinction must however be made between two types of interaction with the target language:

- learner interaction with actual input: i.e. the language material mediated by the computer (provided by the teacher or retrieved by the learner himself through the informative function of technology);
- learner interaction with other participants in the learning process (teacher and/or peers): this may take place on a face-to-face basis or be computer-mediated (communicative function).

The question that remains is if any of these interactions can indeed be organized or planned. The answer(s) determines the forms that mediation can actually take.

A common specificity of these two sub-systems lies in the fact that although clearly in line with the systemic perspective described in earlier pages, they include organization factors borrowed from the hypermedia philosophy. They should indeed integrate the notions of unpredictability and uncertainty inherent in the learner, hence a focus on interactivity, on hypertext/hypermedia presentation of information, on heuristic learning (browsing and discovery strategies), and therefore on tutoring (for guidance, control and retroaction).

The presence of two distinct systems also illustrates the specificity of the didactic ergonomics model in relation to the industrial ergonomics one, as it clearly stresses the differences between the two human subjects in the learning process.

A further remark stemming from the identification of these sub-systems is that the computer space should be perceived as the juxtaposition of two distinct interfaces: a teacher interface, turned towards sub-system 1; a learner interface, oriented towards sub-system 2.

Figure 17. Sub-system 2 (learner-centered)

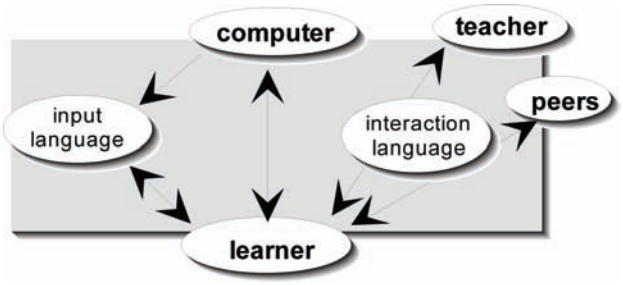
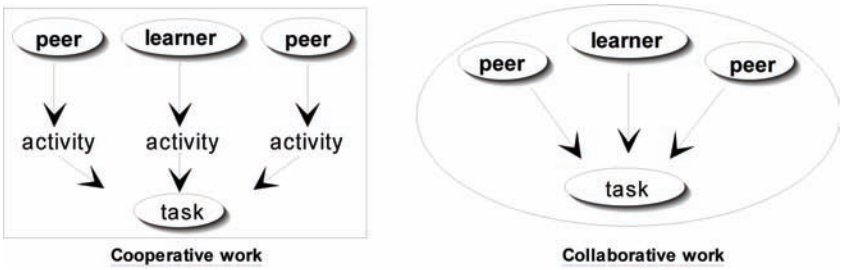


Figure 18. Sub-system 3 (peer-centered)



The learner-centered sub-system is moreover linked to another peer-centered sub-system (Figure 18). Peer-to-peer interaction itself may be organized or interpreted in either of the two following ways: cooperative and collaborative work.

Although both derive from the industrial production concept of shared/group work, the two types of organization differ significantly:

- Cooperative work is based on the interaction of several actors with a common goal and on the division of work. Applied to the field of language learning, this type of organization gives rise to a situation where learners work separately on a common task and discuss strategies and methods before and after individual work phases.
- Collaborative work relies on end-to-end communication between the participants without any division of the task. This type of work may be totally computer-mediated when so-called 'collaborative platforms' are available.

These types of organization in a distance language learning context will be further discussed in chapter 9.

In both cases, there exists another important difference between the industrial and the didactic models. In the first case, the final goal is the task. In our case, the task is an intermediate operation supporting the language learning process. In other words, cooperation and collaboration may be efficient modes of organization only insofar as they generate authentic communication and thus favor language interaction and cognitive processes. While the industrial production process follows a linear model, the language learning model is a reflective and individual one in the end.

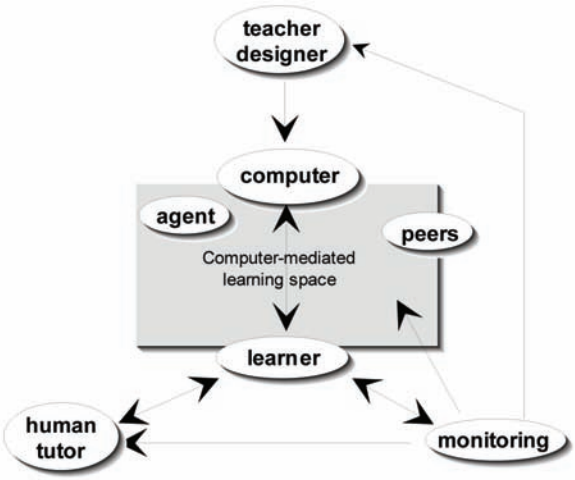
For the whole system to be efficient, the articulation of these three sub-systems requires the existence of a fourth sub-system focusing on control and regulation (Figure 19).

Without entering into details that will be developed in a later chapter, the regulation sub-system is essentially based on the monitoring capacity of the computer. Monitoring of learner activity in the virtual learning space generates three main flows of information (follow-up): learner-oriented for individual feedback, tutor-oriented for process control and guidance, and teacher/designer-oriented for system reorganization when necessary.

This sub-system is all the more important as it highlights new roles and possibly new actors not previously mentioned in former models:

- The human tutor, distinct in his nature from the teacher, who takes up (part of) the guidance role inherent in the pedagogic mediation process. Usually associated with the teacher, the tutor in the CALL and distance learning model is given a separate existence, with specific implications as to provision of human resources for the global learning environment and to training requirements.

Figure 19. Sub-system 4 (regulation)



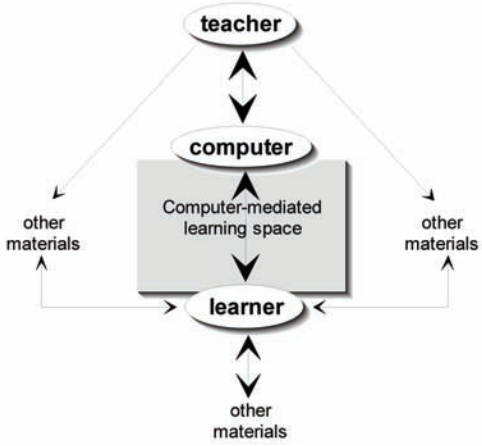
- This tutoring role may be partly taken in charge of by technology, and specific research on "teaching agents" or "machine tutors" has been produced in recent years (Bertin et al., 2005; Bertin & Gravé 2006; Bertin & Narcy-Combes 2008).
- Feedback on the behavior of the system contributes to diversify the teacher's traditional roles. In a CALL context, he must provide structural and/or functional retroaction when the gap turns out to be too wide between the final goal and the provisional state of the system.

The regulation sub-system is closely related to all the other sub-systems we have outlined so far.

Our didactic ergonomics model would not be comprehensive without taking into account the possibility for both learner and teacher to provide and interact with materials external to the computer-centered system (Figure 20).

This widening of the scope corresponds to the identification of the global learning environment we mentioned earlier. Interactions of the CALL system with other external systems, each with its own internal logic, confirms that the model we are advocating does not proceed from a technocentric

Figure 20. External interactions of the system



approach. The apparent emphasis placed on the computer corresponds to the necessary focus on the questions linked to the notions of technological and pedagogic innovation. At each step of the process, the computer remains only one of the tools available to the teacher.

Its median position at the interface of so many sub-systems significantly modifies its original status of an artifact. From a technical instrument turned towards action, it rapidly evolves into a psychological instrument since it makes it possible for the subject to control and regulate his

own activity (Vygotski cited in Rabardel, 1995, p. 87). Rabardel notes that it also turns into a semiotic tool in a teaching perspective, i.e. *an aid for the operator's cognitive activity by providing information necessary for action and by guiding the implementation of operational sequences*[13] and into a cognitive tool, in a learning perspective, i.e. *an artificial device designed to preserve and present information or to process it for representative purposes*[14], in the case of language for example. *[Cognitive tools] take in charge part of the user's cognitive activity and thus contribute to the completion of the task*[15] (Rabardel, 1995, p. 87).

Reconciling Theory and Use

No model in human sciences can hope to give a final representation of phenomena and processes and the didactic ergonomics model is no exception to this rule. Its claim at comprehensiveness derives from its flexibility to suit present and future research.

A striking instance of such flexibility would be the evolution of our attention to context. The first published versions of the model (Bertin 2000, 2001a & 2001b) associated institutional context, i.e. the educational policy of the local establishment, with the construction of pedagogic objectives for language learning (teacher ⇔ language relationship). Attention paid to social sciences and especially work organization studies, supported by growing evidence from the action research in the field of education, points to the necessity to considerably enlarge the original definition of context:

Guy Jobert showed how a focus on the instrument without enough attention to its context could lead to users' lack of interest for the learning environment and consequently to financial waste. The repeated failures of technology-centered environments have illustrated what Monique Linard (Linard, 1990) defined as "the frequent confusion between the goals and the power of technology which is a constant error in all techniques". She adds: "this accounts for (...) the tendency to forget the narrow limits inevitably imposed by the context and the limited degree of implementation in which it can succeed". (...) An educational issue should be envisaged within an engineering perspective taking the nature of the context and the characteristics of the population into account. (Annoot, 2005 in Bertin et al., 2005, pp. 34-35)

More specific research also shows the all-pervasive dimension of contextual influence. In their own individual action-research oriented studies, Peyrard-Zumbihl (2004), Beaufils (2007) or Khreim (2008), to name but a few, have demonstrated how didactic intention is necessarily constrained at different levels of implementation by the specific conditions imposed by the various contexts. The flexibility of a model is linked to its confrontation to reality and action-research offers a most useful tool in this respect.

The systemic approach is concerned both with the interactions at work within the system as well as those between the system and its environment. What research in didactics points to is the extremely close relationship that the learning environment has with its context.

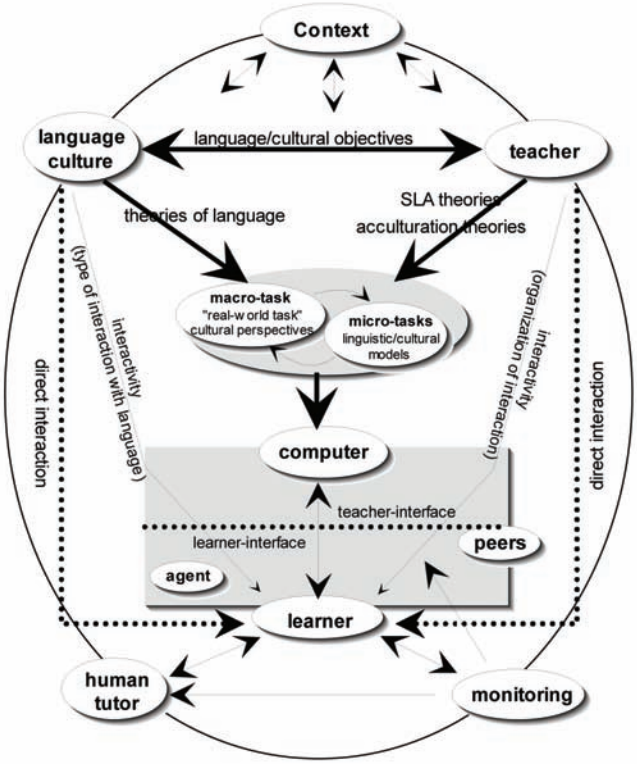
As a consequence, our model can be taken a step further by granting the context a similar status to that enjoyed by the four already defined poles. The four-pole model naturally turns into the five-pole one represented in Figure 21. The figure illustrates the present state of the didactic ergonomics model, which forms the basic structure of this book.

Didactic Ergonomics and Current CALL Research

How does the didactic ergonomics vision bring new insight into the field of language learning?

Since the late 1980's, CALL has been the object of a large number of studies. An exhaus-

Figure 21. CALL and distance language learning – the didactic ergonomics model



tive description of this literature proves almost impossible and the reader will profitably turn to some of the more recent reviews such as Chambers & Davies (2001), Bosley & Moon (2003), Zhao (2003), Chambers et al (2004), Hubbard (2005), Bush (2008) and, for the latest ones, Garcia Villalda (2009) or Hubbard (2009).

To resist the technocentric temptation, the need to reconcile theory and practice has been a permanent concern: Smith (1987), Liddell (1995), Rüschoff & Wolff (1995), Levy (1997), Swaffar et al (1998), Egbert (2005), Ducate. & Arnold (2006), Hubbard (2008). Hubbard distinguishes two main trends in the literature:

- the first trend, influenced by Chapelle (2001), *links the design and evaluation of CALL tasks to a set of principles derived primarily from the research base of the interactionist perspective of second language acquisition*;
- the second trend follows Bax (2003) and *views 'normalization' as the defining direction in the field, a state where technology is fully integrated into language teaching and ceases to be special or unusual, much like the textbook, pen, and blackboard of the traditional classroom* (Hubbard, 2009, p. 3).

Didactic ergonomics relates Chapelle's interactionist perspective to a wider systemic standpoint including Morin's concept of complexity. It advocates a vision of ICT integration based on contextualization rather than 'normalization'.

A significant majority of the English speaking authors relate theoretical approaches with implementation and practice or even with 'best practice'

(e.g. Felix, 2003 or Klapper, 2006). The present book may reveal a cultural trait of its authors by focusing more explicitly on the theoretical and philosophical issues at stake. This book takes a more integrative stance and enlarges its scope to include a wide array of background theory.

Didactic ergonomics should be distinguished from the specific field of Human-Computer Interaction (HCI) which also stems from the concern to combine technology and human activity. Originating in computer sciences and ergonomics, HCI has been transferred to the field of language learning. Allum (2001) defines it as follows:

How can good lesson plans, classroom or textbook activities be transformed into effective CALL exercises? What concepts, methods and guidelines will ensure a smooth transition from a learning task performed in a classroom environment, with printed texts, notebooks, dictionaries, pencils, eraser, classmates and a teacher to one performed in a computer lab using input/output devices, an interface, and the computer's functionality? What kind of interface and functionality should be created to allow, on the one hand, pedagogic principles to be followed and, on the other, to allow students to perform their task not with hesitation or difficulty caused by the means of instructional delivery, but rather with pleasure and satisfaction? (Allum, 2001, p. 146)

As didactic ergonomics, HCI considers the language learning space as a system. Its objective is to privilege the learning process over the technology which is supposed at the same time to favor cognitive processes and to 'disappear' from the scene:

Effective systems generate positive feelings of success, competence, mastery, and clarity in the user community. The users are not encumbered by the computer and can predict what will happen in response to their actions. When an interactive system is well-designed, the interface almost disappears, enabling users to concentrate on their work, exploration or pleasure. Creating an environment in which tasks are carried out almost effortlessly and users are 'in the flow' requires a great deal of hard work from the designer. (Shneiderman, 1998, p. 10)

HCI clearly focuses on interface design and interactivity, drawing on functional ergonomics:

while appropriate and adequate functionality is essential, the interface is critical in ensuring that the system achieves the goals described above by making the functionality easily available to the user (Allum, 2001, p. 147),

… as well as on cognitive psychology:

the problem for any designer of applications (or CALL-ware) is how to ensure that there is two-way communication and that it is as effortless as possible. In so far as it is effortful, it puts an extra cognitive load on the user. And in so far as it does that, it diminishes the mental resources that can be applied to the task it is designed to help the user achieve. (Allum, 2001, p. 147)

In this light, the area covered by HCI in our didactic ergonomics model corresponds to the articulation between the teacher-centered and learner-centered sub-systems (Figure 16 & Figure 17). HCI is of major significance for the design of the 'learner' and the 'teacher' interfaces identified in the previous pages and illustrated in the model (Figure 21).

HCI also shares with didactic ergonomics the reference to models, although these are of a more specific nature. As an example, Cooper (1995, pp. 27-40) identifies three essential references on which to ground HCI research. The 'user model' describes the mental representations of the system by the users as well as the designer's representation of the user. It is close to the two sub-systems we have just mentioned and can be

used as a basis for the design of the teacher's and the learner's interfaces. The 'designer model' represents the system as it is created by the designer/teacher. In our perspective it corresponds to what we will refer to as the didactic intention underlying the learning environment/space. The 'implementer model' points to the way the designer model is re-interpreted by the computer programmer. It describes the actual tasks carried out by the computer for each pedagogic function implied in the designer's didactic intention. This model is close to how the learning space works in technical terms.

Such HCI models are used to design the interface of the learning space more specifically, and do not take the whole learning environment into consideration. They are primarily concerned with the technical translation of the designer's didactic intention and with ascertaining these technical aspects will fit the cognitive characteristics of the learner.

However, even if designing an interactive interface has become easier, CALL development must not only learn to better harness the new technology but also, and critically so, build on its knowledge of users and be more receptive to their needs if it is to benefit from Web-based delivery. (Hémard & Cushion, 2001, p. 15)

By integrating this vision into the wider perspective of the whole learning environment, we believe didactic ergonomics draws on HCI as it does on more fundamental sciences (linguistics, language learning and acquisition theories, socio-psychological approaches to context…) and thus offers a wider scope to distance language learning environments design.

Another field where didactic ergonomics can bring a significant contribution is that of 'intelligent' CALL design. The relationship which language learning entertains with computer sciences is complex and reciprocal (Cushion, 2006) and the need is strongly felt for comprehensive models. For Artificial Intelligence (AI) systems, only *what can be specified can be represented* (Colpaert, 2006, p. 119). The problem is that what can be represented is directly linked to the theoretical constructs on which the system is based. Each individual component of the system must be clearly identified and situated in relation to the others before specifications can be elaborated. Didactic ergonomics offers a comprehensive framework from which to build these constructs, taking into account the variety of interactions at work.

SYNTHESIS

How has the chapter answered the questions raised in the introduction?

- How can the complex reality of distance language learning be accounted for? The complexity of this reality combined with the degree of uncertainty inherent in any human activity, have led the authors to take into account interactionist and systemic theories, as well as Morin's concept of complex thought.
- How can former of models of language learning contribute to a better understanding of distance language learning? The present chapter has shown how a general model of didactic ergonomics gradually emerges from the discussion of former models of language learning and of how these can match computer-mediated language learning situations.
- How can a didactic ergonomics model give a more accurate representation of the situation? The didactic ergonomics model presented at the end of the chapter gives a description of the component parts of the CALL situation as well as their interfaces, i.e. the places where interactions take place. Its objective is similar to general / industrial ergonomics models: favoring

the process which constitutes the final goal of the system (language learning, in this case) by identifying interactions and roles involved. Yet, it significantly differs from these models insofar as it identifies different types of relationships between the human actors and the technology. At the same time, it underlines how technology revisits traditional pedagogic relationships and creates the need to revisit theoretical conceptions.

- How does didactic ergonomics fit into current CALL research? The model offers a more comprehensive scope than other types of ergonomic research in the field, most significantly research in Human-Computer Interaction and Artificial Intelligence. Epistemological coherence between these fields is however preserved so that they can draw on each other to improve common understanding and advancement of CALL.
- What essential components does the didactic ergonomics model highlight in the computer-mediated language learning situation? The model is based on five poles: language, learner, teacher, technology and context. Each of these poles – as well as the central process – is meant as a 'real object' in Bachelard's terms, and should be constructed out of existing theories in the light of the new type of setting: the (distance) learning environment.

As a consequence, each chapter forming the second part of this book will focus on a specific pole in order to suggest a conceptual framework available to CALL researchers, practitioners, designers and administrators. Before reviewing them, however, it is necessary to consider how the passage from CALL to distance language learning impacts this didactic ergonomic model.

AUTHOR NOTE

Note: quotations originally in French have been translated by the authors. The original text is presented in the end-of-chapter notes.

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ENDNOTES

1 *Les approches analytique et systémique sont fondées sur des postulats épistémologiques différents, préconisent des façons différentes de percevoir la réalité, utilisent des méthodologies qui leur sont propres et abordent l'étude d'ensembles possédant des niveaux de complexité divers.*

2 *Ce qui caractérise ce mouvement, c'est son pragmatisme, le travail de terrain délibéré et la volonté de comprendre l'ordre social et ses dysfonctionnements pour y porter remède grâce à l'action des travailleurs sociaux encadrés par des sociologues.*

3 *Selon eux, la complexité de la moindre situation d'interaction est telle qu'il est vain de vouloir la réduire à deux ou plusieurs variables travaillant de façon linéaire. C'est en termes de niveaux de complexité, de contextes multiples et de systèmes circulaires qu'il faut concevoir la recherche en communication.*

4 *Les technologies actuelles nous permettent d'enregistrer la parole/le discours avec plus de certitudes qu'autrefois. Toute proposition de système descriptif ne restera néanmoins qu'une approximation de la réalité (l'organisation cognitive interne) car l'accès à la parole ne donne pas accès à cette organisation cognitive interne qui permet de l'émettre.*

5 U***but****à atteindre dans un****environnement****donné, au moyen d'****actions****ou d'****opérations.*** *(highlighted in original text).*

6 *L'homme occupe une position résiduelle et son activité n'ayant plus de statut propre, elle ne peut, le plus souvent être pensée que dans les termes mêmes du processus technique.*

7 *L'homme occupe une position centrale depuis laquelle sont pensés les rapports aux techniques, aux machines et systèmes. Cette option place l'activité de l'homme au cœur de l'analyse et, de ce fait, permet d'opérer le renversement nécessaire pour pouvoir parler des choses en fonction des hommes…*

8 *Aucun de ces deux points de vue n'est, à lui seul, suffisant. La seule approche technocentrique tend à placer l'homme dans une position résiduelle et ne peut véritablement permettre de penser son activité ; tandis qu'une option unilatéralement anthropocentrique est incapable de penser les systèmes techniques dans leur spécificité technologique. L'issue n'est donc pas dans la négation d'une des approches (…) mais dans leur articulation à la fois conceptuelle et pragmatique permettant de penser un système de production du point de vue technologique comme de celui de l'activité des hommes.*

9 *… une perspective dominée par les trois caractéristiques essentielles des sciences de la nature (prédictibilité, répétabilité et quantification mathématique) et qui tend à exclure intuition, jugement subjectif, connaissances tacites, imagination et intentionnalité.*

10 *Les artefacts ne doivent pas être utilisés en tant que choses, mais dans la façon dont ils médiatisent l'usage.*

11 *Cette représentation (…) respecte l'idée selon laquelle le processus didactique n'est dominé ni par le professeur, ni par la langue-objet, ni même par l'outil en tant que tel, auquel cas on courrait le risque d'enfermer l'apprenant dans un vase clos dont le danger serait de « submitting the learner constantly to more or les passive input, causing the triangular structure to tip towards either the dogmatic side of T or the systematic side of O » [Perrin 1990: 20]… ce à quoi nous ajouterons désormais: « … or the technological side of C.*

12 Avec le modèle comportementaliste, issu d'une conception behavioriste de l'apprentissage, le dispositif prend une acception technique, d'instrument d'exécution au service d'objectifs définis préalablement,

indépendamment des acteurs qui l'utiliseront comme outil d'acquisition graduelle des connaissances. Le modèle socioconstructiviste d'une pédagogie des groupes interactive refuse de faire du dispositif un simple objet technique, un simple outil, neutre, institué et statique, en postulant que les acteurs, et les objectifs qu'ils se donnent font partie intégrante du dispositif ; c'est récuser une conception technique au profit d'une conception systémique. C'est dénoncer une conception techniciste, réductionniste, qui décompose, cloisonne les différentes étapes de l'apprentissage, sans envisager les rétroactions, le poids des interactions entre les apprenants et la tâche, et les ajustements inévitables qui s'ensuivent si les enseignants tiennent compte du feedback que leur renvoient ces interactions. Une acception du dispositif comme système implique donc une conception évolutive, dynamique du dispositif.

[13] *Une aide pour l'activité cognitive de l'opérateur en apportant l'information utile à l'action et en guidant le déroulement des séquences opératoires.*

[14] *Dispositif artificiel conçu pour conserver, présenter de l'information ou la traiter afin d'assurer une fonction représentative.*

[15] *[Les outils cognitifs] prennent en charge une partie de l'activité cognitive des utilisateurs et contribuent ainsi à la réalisation de la tâche.*

Chapter 2
Introducing Distance into the Model

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OBJECTIVES OF THE CHAPTER

This chapter will try to answer the following questions:

- Is distance learning and teaching a unified paradigm?
- How can psycho-sociology help us develop an original perspective of distance?
- How can the concept of mediation be described in distance learning contexts?
- What 'hidden' dimensions of the pedagogic situation are revealed in distance learning contexts?

This chapter will consider how the introduction of distance impacts the didactic ergonomics model constructed in chapter 1. In accordance with the systemic approach adopted in this book, we will first define the notions of distance learning – also referred to as e-learning. Then we will question the notion of distance itself to see how its specific meaning in our context intensifies the complexity of the language learning situation while at the same time making more explicit processes previously kept hidden.

Distance should not however be considered just another pole of our model. It does not in itself generate new sets of interactions, but rather it modifies existing ones to an extent that remains to be defined. Instead, we will consider that it adds a new dimension: the shift from a face-to-face setting to distance learning superimposes an extra virtual, or immaterial, layer in the initial situation. The nature of this so-called virtual reality will be explored in

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psychosocial terms to understand how learning processes are affected.

One important consequence of this new dimension in a systemic perspective is the blurring of the borders between the two systems constituted by the wider learning environment and the virtual learning space respectively, and the increased difficulty in observing the events that take place within this border and without. The initial epistemological issue related to the absence of direct observation of phenomena in the field of didactics is further reinforced in our case by the necessary distance between the observer and the system(s). Another difficulty stems from the appearance of new 'virtual actors' due to an increased need for social interaction felt by isolated online learners. Former studies (Belisle & Linard, 1996; Montandon, 2002; Chapelle, 2003; Bertin et al., 2005; Bertin & Gravé, 20006; Bertin & Narcy-Combes, 2008) have shown how it may be necessary for researchers, designers and teachers to acknowledge the presence of 'virtual peers', 'virtual teachers' or even 'virtual tutors' whose presence may be mediated by a wide array of technological devices. Yet their roles cannot be satisfactorily accounted for as long as the nature of the distance learning situation has not been properly outlined.

Resorting to the didactic ergonomics model as a conceptual tool will help us study how the added dimension brought along by distance sheds new light on the various poles and their interactions. By turning to a psychosocial perspective, this chapter will show how distance turns out to be a revelator (an 'analyzer') bringing new insight to more traditional language learning situations.

DEFINING CONCEPTS

Distance Learning and Teaching

Correspondence courses constitute the original form of what we now call distance learning, open learning or even e-learning since the advent of computer networks and the Internet. Although e-learning specifically refers to computer technology, distance learning is generally used in a wider – and more ambiguous – sense. In a distance learning setting, the learner often uses on his own educational materials of various nature in a place which is not a classroom. This place may be his home, the firm he works in, a resource center, etc. Materials have been produced in advance by teachers or specialists who are not normally present in the room. By definition, distance learning then involves a separation of time and space between teaching and learning activities and the link with an educational institution (Glickman, 2002).

Although certainly accurate in its description, this approach fails to define the concept of 'distance' precisely, as it places under the same heading such distinct notions as geographical distance, technology, and autonomous learning. More complexity is introduced by the adjective "open" in such expressions as 'open and distance learning':

An organized and finalized environment recognized as such by the actors, which takes into account the singularity of people in their individual and collective dimensions and which relies on complementary and diverse learning situations in terms of time, space, human and technological mediations as well as resources[1]*. (Collectif de Chasseneuil, 2000, p. 177)*

Open and distance learning encompasses different situations, such as correspondence courses, online systems, resource centers, radio or television courses, videoconferencing, and virtual classrooms or campuses. As face-to-face courses tend to focus more and more on self-learning, they grant more and more importance to distance learning tools and to blended environments (Delamotte, 1998; Fichez, 1998; Scida & Saury, 2006; Bañados, 2006; Almeida d'Eça & Gonzalez, 2006). The expressions 'virtual' or

'digital campuses' reflect the trend in higher education to implement e-learning policies offering students a network of learning activities, tasks, and materials for individual and collective work in a specific field or discipline. Four main functions define the concept of a virtual campus: navigation and production tools, support, collaboration, and access to information (Henri & Lungren-Cayrol, 2001). Learning in a virtual campus is not supposed to be a solitary activity as the student can communicate with experts, teachers, and peers. Virtual campuses display a wide range of forms, with various degrees of interactivity and openings onto intranets, counseling, mailing, as well as job placement facilities (Annoot in Bertin et al., 2005).

At a lower level, Hiltz describes 'Virtual Classrooms' (the term itself has become a Trademark) as

a teaching and learning environment located within a computer-mediated communication system. Rather than being built of bricks and boards, it consists of a set of group communication and work 'spaces' and facilities, which are constructed in software. Some of these communication structures resemble facilities or procedures used in traditional classrooms. Others support forms of interaction that would be difficult or impossible in the 'face-to-face' environment. All are accessed, not by traveling to a university, but by typing and reading from a personal computer […]. Participation is asynchronous, that is, the Virtual Classroom participants dial in at any time around the clock, and from any location in the world accessible by a reliable telephone system. (Hiltz, 1995, p. 3)

For Hotte & Leroux, the confusion between online or distance learning constitutes *a historical as well as epistemological mistake* as online learning is restricted to ICT-based systems; whereas, distance learning may include more traditional 'correspondence courses' (Hotte & Leroux, 2003, p. 2). Thus defined, the concept is close to the North-American one of 'distributed learning'.

It is part of a trend to use a mix of delivery modes to complement face-to-face learning opportunities. Part of this mix usually includes the use of multimedia learning opportunities and participation in online discussion, as well as working with print-based sources. (White, 2003, p. 31)

Distributed learning may be seen as an intermediate step between distance learning (virtual learning spaces) and the face-to-face mode (global learning environment) (Radic, 2001), while a more American approach considers that the expression 'distance education' should be limited to the teaching of a distant class by means of audio or video conferencing (Inglis, 2001). Distributed learning, such as Oblinger defined it, remains in fact very close to the Virtual Classroom mentioned earlier:

Distributed learning is not synonymous with distance learning. Distributed learning uses IT, both synchronous and asynchronous, to deliver education at flexible times and locations […] It can provide a mechanism to extend class interactions to seven days a week, twenty four hours a day. (Oblinger, 1999, p.1)

While 'open learning' would tend to refer to modes of pedagogic organization focusing on the learner's active role (Jézégou, 1998, Pouts-Lajus, 2002), the variety of expressions is not totally justified by actual practice, and V. Glickman (2002, p. 45) noticed that they commonly denote similar contents.

Our stance in this book will be to refrain from entering into this terminological debate, even though specific approaches might indeed be described, and to focus on the conditions and nature of the pedagogic mediation at work in an ICT-based distance learning context.

Early references to distance learning were commonly rooted in the face-to-face versus distance dichotomy, i.e. a geographical representation based on the physical remoteness of the teacher. Numerous metaphors in specific technology language reinforce this initial perception: *navigation, global village, information highway, home page*… While such descriptions heavily rely on the geographical or physical connotations (Campion & Guiton, 1991, Bernard, 1999), other authors emphasize the multidimensional nature of the new learning environments. Keegan (1990, p. 44), for instance, identifies five main features characterizing distance learning:

- separation of teacher and learner;
- institutional influence on materials design, availability of resources, monitoring and feedback facilities;
- resort to technology of any type (printed, audio, video or computer-based materials);
- learner-teacher interaction of some sort;
- group interaction and face-to-face meetings.

Demaizière (2004, p. 86) adds that these structural components should ideally converge and she stresses the need for a pedagogic engineering approach (importance of learner initiative, individualization of paths, importance of individual work, and institutional tutoring). Moore et al focus on the necessity to plan and organize mediation as a result of distance:

Distance education is planned learning that normally occurs in a different place from teaching and as a result requires special techniques of course design, special instructional techniques, special methods of communication by electronic or other technology, as well as special organizational and administrative arrangements. (Moore et al, 1996, p. 2)

What these descriptions point to is the far more complex nature of distance than originally anticipated:

The unprecedented expansion of information and communication technologies upsets the order of the world by changing the scale of impact of political, economic and engineering options. Today, the existence of virtual meta-libraries and databases as well as digital university campuses open onto the whole planet seriously questions educational practices. It challenges the human and social vision at the origin of learning environments as well as our commitments as social actors in terms of economic, pedagogic or even cognitive models[2]*. (Albero, 2004, p. 254)*

What is therefore required to cope with the plurality of dimensions involved in distance learning is a conceptual tool that will help us better understand how pedagogic mediation at a distance impacts the various poles of the didactic ergonomics model as well as their interactions.

The 'Analyzer': A Conceptual Tool

The 'analyzer' concept is derived from the psychosocial approach to human organizations and institutional analysis. G. Lapassade provides a wide ranging definition of the concept:

... anything that causes truth to emerge of what is hidden; anything may refer to a group, an individual, a situation, an event, a scandal […][3] (Lapassade, 1971, p. 15). F. Petit adds that what is hidden is the origin of social relationships and of their reproduction. The analyzer can be described as *a decomposing machine which may be either natural or constructed for experimentation or intervention purposes*[4] (Petit, 1991, p. 227). Natural analyzers are seen to emerge from a crisis affecting a group or an organization, i.e. a political or social crisis. They also include individuals or groups who, by their devious behaviors, challenge the instituted organization.

The 'analyzer' concept relies on the distinction between three notions and three related phases organized in a dialectical relationship: the establishment (*l'institué*), the challenging force (*l'instituant*) and institutionalization (*l'institutionnalisation*).

- The establishment (*l'institué*) corresponds to the initial order of things: the set of dominant values and standards, statuses, roles and laws on which social order is grounded. It claims universality and truth and is interpreted as a conservative drive. This corresponds to an assertive phase.
- The challenging force (*l'instituant*) questions the establishment by challenging its universal claim. It is a negation phase.
- Institutionalization (*l'institutionnalisation*) is the process by which the innovative drive of the challenging force (*l'instituant*) is assimilated by the establishment, thus giving rise to new rules allowing the institution to move on. This represents the integration phase.

The institution therefore appears as the product of the dialectical sequence of these three phases, of the confrontation between the establishment, and the challenging force. It can be defined as the set of norms accepted in a social system which defines what is or is not legitimate.

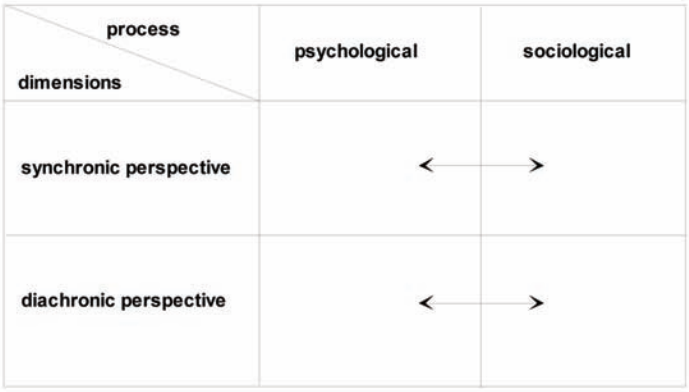
We are resorting to the analyzer concept because the introduction of distance within the field of language learning eventually makes it necessary for teachers, designers, administrators, and most significantly for the learners, to reconsider their places within the pedagogic situation as a whole. While all the poles of the model need to be described in terms of the theories on which they are grounded, distance brings new questions concerning their nature as well as the relationships they entertain. Its physical/geographical dimension calls up the notion of absence (of the teacher, of the tutor, or of the other learners, etc.). It also introduces discontinuity in a process traditionally characterized by the continuity of the teacher-learner relationship: discontinuity in the articulation of the teacher- and learner-centered subsystems (see preceding chapter), discontinuity in the operation of the regulation sub-system (monitoring and tutoring activities), discontinuity within the learning process itself which may be spread over discrete periods of time.

In other words, the notion of 'establishment' (*l'institué*) may be debatable in the case of language learning, as observations of teaching/learning practices reveal a wide array of extremely dissimilar situations. Pedagogic innovation, however, and more specifically the introduction of distance in its association with technology, challenges accepted representations of the various actors. It can indeed be understood as an analyzer in the sense that we have just defined.

Distance definitely compels us to face elements previously hidden (because implicit) in traditional face-to-face language learning and teaching. Its close association with technology, in the case of online environments, makes it difficult for observers to make out a unified paradigm out of the diversity of technological forms. Yet, considering the situation from the psychosocial angle provided by the 'analyzer' concept, it becomes possible to initiate a coherent description of distance language learning.

Based on typologies, conventional approaches to distance are often reductive because they focus on clear-cut specific dimensions (geographical, time, social or technological) without necessarily relating the one to the other. This method comes under criticism by such proponents of a more complex reality as E. Morin (1990); while focusing on his particular field or object, the scientist should never lose sight of its connections with other fields. In our specific case, ignoring the complexity of this dialectic relationship fails to take into account the inherent duality of the notion of distance.

Figure 1. A matrix approach to distance learning



Instead, considering distance as an analyzer enables us to see its complex and dynamic nature. Distance emerges on the one hand as the product of a dual relationship between psychological and social processes. Neither of these types of processes can be described on their own; they closely interact in the learning situation. On the other hand, these processes should be studied in a two-dimensional perspective: a synchronic approach offering a series of photographs of the situation, stressing the discontinuities in the process; and a diachronic approach focusing on individual paths and strategies, recreating continuity through a dynamic perspective.

The analytical matrix figured below is built from the combination of these two approaches (Figure 1), and provides us with the necessary observation tool.

The synchronic perspective provides punctual representations of the effect of distance on the processes; e.g. which cognitive processes are involved at a specific moment (psychological processes); or which relationships does the learner entertain with the other participants in the situation at a given time?

The diachronic perspective offers a more dynamic representation of these processes over a given period; e.g. how do individual strategies evolve over time (psychological processes); how do cooperation/collaborative work and mediation evolve during the learning (sociological processes)?

This matrix-based approach to distance learning results in a non-linear description of the processes themselves. Neither the psychological nor the sociological processes on their own can account for the changes introduced by distance. However their articulation, as well as a multidimensional conception of mediation itself can help us form a more appropriate representation of the new reality.

Observing how distance impacts the various processes operating in a matrix-based approach, then leads us to consider the issue as a series of unresolved oppositions:

- how does distance impact the relationships between teacher-centered, learner-centered or even task-centered approaches?
- how does distance bring new insight into learner-teacher relationships?
- how does distance impact pedagogic methods?
- how does distance impact syllabus design (from the general purpose catalogue to tailor-made courses, or from a global educational logic to individualization)?
- how does distance impact learning modes?

- how does distance impact the roles of the various actors?
- etc.

Our stance in the subsequent chapters will be to consider distance as an analyzer of the language learning situation and to decipher the 'hidden', i.e. implicit, processes at work in the various poles and interactions of the model. Using the matrix as an analytical tool will ensure that the stance we are taking is not reductive and includes the degree of complexity required to understand, and hence organize, distance learning environments as well as virtual learning spaces.

ANALYZING DISTANCE LEARNING ENVIRONMENTS

The Three Dimensions of Mediation

Considering distance as a new dimension superimposed on face-to-face or computer-mediated language learning situations gives rise to a further distinction in the nature of mediation itself. The different steps in the construction of our model point to the existence of several dimensions in mediation, each appearing at times when pedagogic necessities or technological innovation require new thinking. Three main dimensions seem to emerge, which we will refer to as 'pedagogic mediation', 'technological mediation', and 'mediation by distance'.

Pedagogic Mediation

The construct of 'mediation' in education has its roots in the sociocultural theory of learning, and particularly in the work of Vygotsky (1978), Leontiev (1981) and Wertsch (1991). In contrast to the cognitive model of learning, sociocultural approaches stress the central role of social interaction for learning: all human learning is mediated through, or shaped by, interaction with others, and this shaping does not takes place in a vacuum but through mediation tools. (Lamy & Hampel, 2007, p. 32)

Bertin & Narcy-Combes define mediation in learning environments and/or learning spaces as:

the process of interaction between the tutor (whether it be human or machine) and the learner. This process is necessary in order to make sure that the learning aids and help provided in the environment are really effective. (Bertin & Narcy-Combes, 2006, p. 446)

Pedagogic mediation aims at favoring the cognitive interaction that takes place between learner and the target language, as represented in Figure 2.

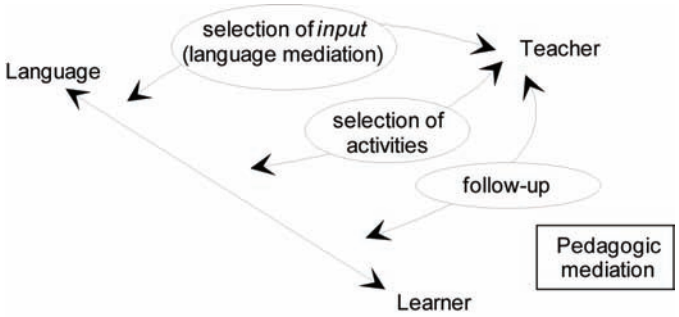
Pedagogic mediation includes a number of operations organizing the learner's activity within the learning environment:

- selection of input, or 'language mediation', consists in providing the learner with the conditions of a cognitive interaction with the language. It defines the 'contents' of the materials and the framework for learner exposure to language;
- selection of activities on which materials or methods are based, in relation with the theoretical assumptions on the nature of the (target) language as well as on the teacher's theoretical vision of language learning;
- follow-up of learner activity through monitoring and feedback.

This simplified representation of pedagogic mediation recalls the triadic nature of most initial models of learning situations which we mentioned in the previous chapter.

The function of mediation is to facilitate the modification of the learner's representations of the second language (denativization) and to help

Figure 2. Pedagogic mediation (adapted from Bertin, Gravé & Narcy-Combes 2009)



solve the cognitive conflict which exposure to second-language (L2) generates. Chapter 4 will further develop this notion.

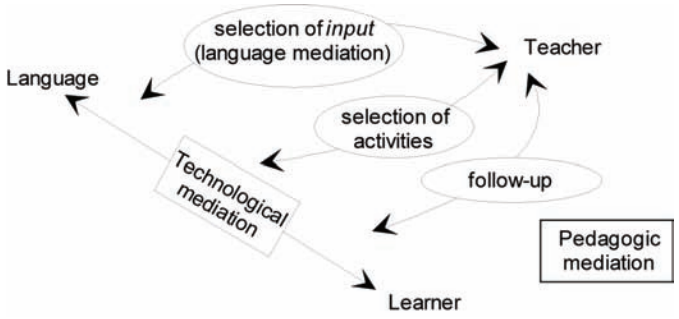
Technological Mediation

Resorting to technology introduces a second dimension in the mediation process insofar as it is inserted into an existing network of interactions (pedagogic mediation) which are thus partially or totally masked by the computer screen (Figure 3).

The nature of this second dimension is a direct consequence of the teacher's didactic intention and technological options. It depends on the extent to which technology is questioned by the designer of the learning space or of the materials. Possible answers range on a continuum between a technocentric vision centering on technological innovation and an anthropotechnological perspective focusing on pedagogic innovation (see chapter 7). The former is motivated by the computer as an artifact, the latter is concerned with the instrumentation of the learning situation.

With the wisdom of hindsight, though, the picture is changing and the best current approaches are driven by sound pedagogical considerations. In these the technology is being used as a tool with a variety of objectives, but two major trends can be identified. On the one hand, it is used to create learning environments in which an imaginative teacher can set up authentic learning tasks and collaborative projects, in which the process and the goals are stimulating and engaging, and which take individual student differences and interests into account. On the other hand, the latest developments in ICALL [Intelligent CALL] and more sophisticated handling of server-side programming, allow us to provide structured online

Figure 3. Technological mediation (adapted from Bertin, Gravé & Narcy-Combes 2009)



activities, tailored to individual students' strengths and weaknesses and providing sophisticated feedback. The best versions of these demonstrate the technology's role in engaging students in both cognitive and metacognitive learning processes. (Felix, 2003, p. 9)

Technological mediation draws on the two meanings of the French words *médiation* and *médiatisation*. By focusing on the 'media', *médiatisation* is initially related to the distribution and display of information. It is connected to the technical transposition of a message from one *medium* to another and to its transformation through the specific nature of the various media involved (Linard, 1989, cited in Albero, 2004, p. 281). In the field of didactics, it should be understood as combining the two notions of mediation and materials design. In an ergonomic perspective, technological mediation combines these various meanings. It considers the issue of the passage of the artefact to an instrument suited to both the final goal (the learning process) and to its users. The initial vision of the computer making information rapidly available should be superseded by the variety of its potential functions in language learning (Felix, 2003, p. 7).

Technological mediation (or 'instrumented mediation') gives birth to a number of teaching and learning acts which require a high level of positive investment from the various actors concerned (teacher, learner, designer, etc.). It is a field which remains sensitive to the slightest technological innovation or even micro changes of paradigms (Marchand, 1998), which reveal evolving interactions and modes of acquisition (Chapelle, 2003 p. 1). As such, technological mediation can be said to represent the initial form of an analyzer of the pedagogic situation.

The difference in the teacher's and learner's representations of the computer may disrupt the smooth coordination of the teacher-centered and learner-centered subsystems (Figures 16 and 17 in Chapter 1). Numerous evidence of the disparity between theory-driven didactic intention of the teacher and learners' actual practice (see chapter 7) draws attention to the importance of ensuring total adhesion from all parties concerned and therefore to opt for an engineering approach to technological mediation (chapter 10).

Mediation by Distance

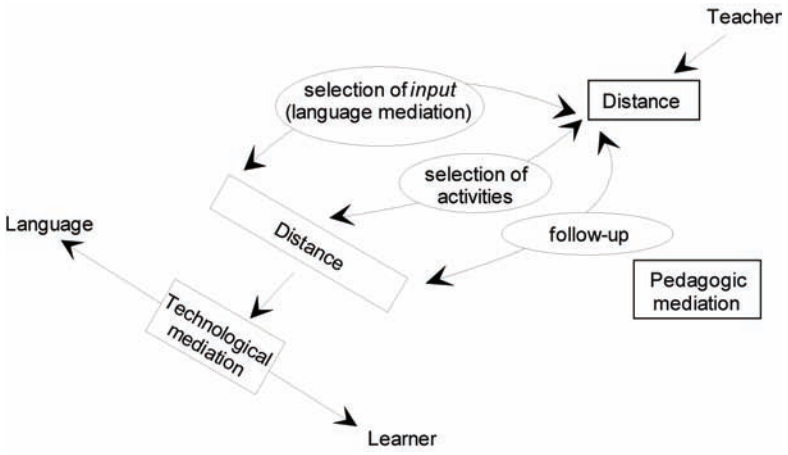
By hiding part of the processes behind the computer screen, technological mediation initiates a process which the introduction of distance takes a step further. Resorting to the computer to alleviate some of the issues raised in traditional distance (i.e. correspondence) courses affects pedagogic mediation in at least two major ways.

The first influence is linked to the gap which appears between the various actors, as represented in Figure 4.

The new dimension introduced in the situation impacts the whole system described in the didactic ergonomics model and more especially the three teacher-centered, learner-centered, and regulation sub-systems. Distance is commonly represented as a number of 'lacks', e.g. absence/disappearance of the teacher with the correlated feeling of learner isolation, enhanced loss of teacher control over materials and processes. Mike Levy noted that in the case of CALL materials, *the audience becomes remote to the author, at least in any detailed or specific sense, and generalized predictions have to be made […]. There is no doubt that the better one knows the needs and characteristics of the user, the better one can make the design* (Levy, 1999, p. 92).

The problem is enhanced in distance learning contexts. This makes it necessary to identify the various effects of distance so that they may be planned as early as the design phase of learning spaces. The function of distance as an 'analyzer' is here emphasized. A major issue that arises is to reconsider the various dimensions of pedagogic mediation, to raise teacher awareness of learning modes as well as of their own expectations, and to

Figure 4. Mediation by distance (adapted from Bertin, Gravé & Narcy-Combes 2009)



anticipate learners' behaviors. Slightly building on Chapelle's remark, the question then becomes *if research on cognitive and social processes helps to identify good opportunities for learning, then how can [*distance learning*] tasks help create such learning conditions?* (Chapelle, 2003, p. 39 – our addition).

At the same time that distance blurs the frontiers between the learning environment and the virtual learning space, it compels teachers, researchers, and designers to conceive as many learning paths as possible, as 'best practice' can no longer be defined in advance.

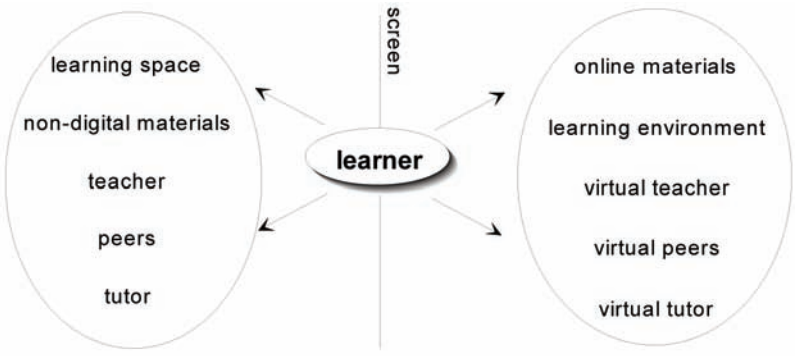
A clear definition of what might be meant by online language learning, or 'best practice', is almost impossible to provide. There are as many different approaches as there are nomenclatures and learning theories, and the task is not made easier by a lack of congruity between learning theory and teaching practice. This in itself is no different from classroom learning, but we now have to deal with the added complication of the role of technology in the process. (Felix, 2003, p. 8)

Rather than introduce just another 'layer' of mediation in the situation, distance creates the need to constantly raise awareness of traditionally implicit processes and strategies and to relate the three dimensions of mediation one with the other. Increased learner autonomy in a distance setting is to be thought in relation to technological mediation, and also, in the way it contributes to alleviate problems of geographical (places of learning/teaching) and time (moments of learning/teaching) distance.

The second characteristic feature of distance learning is the apparent dichotomy between two 'realities' in which the learner is immersed (Figure 5). The virtual learning space displayed on the computer screen reveals a mirror image of the learning environment.

While the screen is sometimes disputably presented as a frontier between two worlds (material and immaterial), the learner is indeed the pivot around which a new enriched reality revolves. In an ergonomic perspective, this means the learner-centered sub-system (Figure 17, Chapter 1) must be re-interpreted in light of this new dimension. The same applies to the teacher-centered sub-system (Figure 16, Chapter 1), including the design activities situated before the actual teaching/learning situation. Distance involves a significant change in the representations of all actors. This means a significant move away from accepted social landmarks and

Figure 5. The enriched reality of distance learning



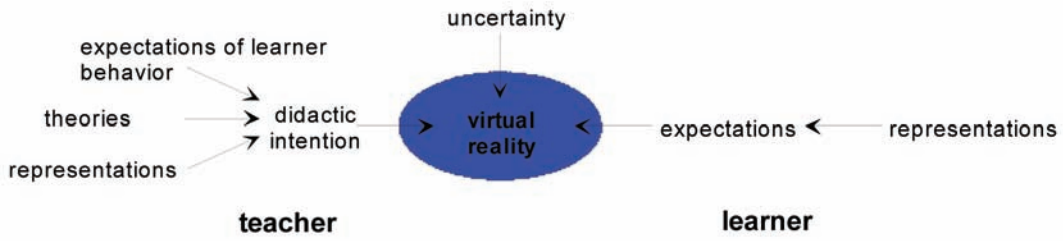
further consequences on the institutional context as a whole.

The mirror image of the screen with its counterpart of the traditional actors therefore has to be organized in such a way as to facilitate the learner's reconstruction of this enriched reality. New social roles and meanings appear at the same time as 'distance' is interpreted differently by the teacher, the learner, the designer and the administrator. For the learning space to operate satisfactorily as a cognitive instrument, these dual psychological and social representations should converge so that the enriched reality should fill the void caused by geographical distance and recreate social and affective links within the new environment.

Another issue linked to the concept of enriched reality is that of its control, as neither the teacher nor the learner retains full control over it. Indeed, as illustrated in Figure 6, the nature of the virtual reality displayed on the screen is by essence the result of a co-construction which should be understood in both social and psychological terms, as figured in our matrix.

On the one hand, it is framed by the teacher's didactic intention, made up of theoretical assumptions, individual representations of the technology and expectations of learner behaviors. This didactic intention is materialized by the learner-computer user interface which provides the learning space with some degree of implicit or explicit guidance. On the other hand, the learner develops expectations based on his own representations of language, language learning, and the technology. These will eventually determine his actual practice of the learning space/environment, irrespective of the teacher's intention. The immaterial space of the screen therefore turns out to be just as another zone of uncertainty, adding to the original complexity of the situation.

Figure 6. Virtual reality – dual control and uncertainty



Implementing the Analyzer in a Distance Teaching and Learning Situation

What can distance reveal which was previously hidden? How does distance contribute to the learner's and the teacher's reconstruction of reality within the learning space? The previous discussion enables us to account for the variety of dimensions to be considered simultaneously when analyzing distance learning environments. Distance as a multidimensional concept cannot indeed be measured and should be understood as combining a number of positive (flexibility individualization…) and negative (loss, risk, absence…) connotations. This should remind us that face-to-face learning situations are not to be taken for granted either.

The physical presence of the teacher does not necessarily warrant his psychological presence, his availability and attention[5] *(Jacquinot, 1993, p. 60).*

Existing literature tends to offer definitions of distance according to linear typologies based on former experimental research, each classification focusing on a specific criterion (e.g. space, time, etc.). Complexity makes it necessary to devise a new approach that takes into account the duality of the sociological and psychological processes described in our matrix.

Distance as an Analyzer of Time

In a second language distance learning and teaching setting, time becomes a complex notion, because it results from individual perceptions and collective representations at the same time.

It can first be perceived as an objective and collective notion (the 'time on the clock') regulating social events, which ancient Greek referred to as *Chronos*. In our context, *Chronos* can be more specifically related to planning, organization of interactions, monitoring and follow-up, for example.

Chronos is to be distinguished from its counterpart *Kairos*, a subjective perception of time connected with the field of psychology. *Kairos* shapes the learners' representations and expectations and determines their experience of interactions and feedback. It underlies the flexible nature of distance learning.

Distance learning is an educational system in which learners can study in their own time, at the pace of their choice and without requiring face-to-face contact with the teacher. (Shelley, 2000, p. 651)

Shelley's reference to *time* and *pace* clearly points to different representations and to the need to coordinate them. Several features of temporal organizations can be outlined.

- Perhaps the most striking one is the temporal discontinuity introduced by distance between teaching and learning, which characterizes the basic opposition between face-to-face and distance learning. It also determines the type of articulation between the sub-systems identified in our model (chapter 1).
- A second discontinuity originating in distance is the freedom for the learner to choose the *moment* and the *pace* of his learning. As the learner may run risks of demotivation and even drop-out owing to the physical absence of the teacher, specific regulation may have to be organized to regulate this discontinuity: work planning, individual schedules, 'pedagogic contracts', etc. We should bear in mind that this temporal dimension also impacts the effectiveness of tutoring, as it affects the learner's perception of feedback delay.
- Temporal discontinuity has major implications on the teacher's expectations of

learner practice and of his own role at a distance. This influences learning materials structure and the roles attributed to the 'virtual teacher', i.e. the teacher's implicit presence in the materials (Bertin, 2001). An example of such implications is the difficulty to combine the teacher's heuristic mode of operation (e.g. he can respond to the learner on the spur of the moment, improvise some of his strategy) with the algorithmic mode of materials (pedagogic planning is made necessary in order to reduce the uncertainty linked with the moments when the learner actually works).

Distance as an Analyzer of Social Interaction

What Hall (1971) refers to as 'social distance' can be associated with pedagogic mediation. While time-distance itself may be interpreted as delayed social distance, technological mediation should be so organized as to manage this delay and ascertain that distance does not cause wide gaps in social interactions.

According to Jacquinot, the distance which turns out to be most difficult to manage is that *separating the person who wants or must learn from the person who knows, who wants or who should teach*[6] (Jacquinot, 1993, p. 60). Quite in line with our conception of the dual nature of reality, this vision further reflects his regret that designers tend to lay more emphasis and resources on design than on the study of psychological and cultural contexts. Such a study may however facilitate or inhibit learning processes for isolated learners in a distance environment.

Hall's (1971) concept of 'proxemy' presupposes the existence of individual spheres whose role is to regulate communication and relationships with others. The related notion of 'interpersonal distance' implies the awareness of cultural representations and schemes. Among the four types of distance he outlined, social distance tends to mark separations between individuals and give them some degree of freedom in initiating communication with others. The concept may be relevant to our context in order to observe how learner-teacher as well as peer-to-peer relationships are regulated and how these can contribute to compensate for the learner's *interactive solitude* (Wolton, 1997, p. 251).

Distance is indeed a useful analyzer of the various sets of relationships at work in our model and can shed new light on how the poles interact.

Thus, for E. Annoot (2000, pp. 5-8), a major consequence of the move from face-to-face to distance learning is to place the learner at the center of the environment. However, this pedagogic organization requires initiative and autonomy without always providing the means to develop such social skills. If more advanced learners expect more autonomy in their learning experience, it is to be noticed that more presence of the teacher is at the same time felt to be necessary (Bertin & Annoot, 1997), as well as communication with peers (Bertin et al, 2005).

As early as 1985, Henry & Kayes (1985) showed that a prolonged absence of contact in educational contexts lead to rapid drop-out and stressed the fact that the social relationship that links the learner to a teacher or a (virtual) community is essential to the learning process. For Glickman, by requiring learners to be autonomous, distance learning tends to make them solitary and sometimes even unable to respond to a number of self-learning situations. By so doing, it contributes to discourage them and to extremely high drop-out rates. In order to fight this isolation, more and more distance learning environments offer communication facilities with the institution and teachers, with tutors or among peers (Glickman, 1994).

An interesting point is the identification of specific risks generated by the introduction of distance in the learning context and liable to lead to final failure, i.e. total loss of control of the situation by the learner and subsequent drop

out. The negative connotations of online learning previously mentioned should therefore be alleviated in terms of social regulation, since it appears that psychological distance decreases in relation to the degree of the learner's involvement and interaction (Shin, 2003, p. 69).

Distance, then, also reveals the need for the teacher to develop new roles among which is that of the *teacher-communicator* who occupies a central place in group learning of various types (cooperative / collaborative). He is the one who calls upon the learners and creates a motivating atmosphere that stimulates communication. He must balance the use of information technology with that of communication technology (Marchand, 1995).

Such evolutions should however be thought in relation with the institutional context. Distance learning environments are most often developed in existing structures already delivering traditional courses. This means that a new public emerges as well as the need for the structures to accommodate them. This new public may include students who prefer working in their own familiar environment, who would like to attend a course which is not available in their own institution but can be accessed from another or working people wishing to update their knowledge and skills. As a result, institutions have to accompany the move from face-to-face to distance learning by providing the necessary human and financial resources. They should develop new types of pedagogic approaches such as blended learning environments relying on language resource centers and the related guidance environment. The stakes of this evolution are high. They cannot be restricted to the local institution and should be promoted by an appropriate language learning policy.

Distance as an Analyzer of Technological Mediation

One of the main differences between technological mediation and mediation in distance learning contexts lies in the relationship between the computer environment and its users. This relationship is largely determined by the degree of technical mastery required of its users and the extent to which learners have access to technology.

The first point belongs to the field of functional ergonomics and becomes especially salient when the virtual learning space results from the heterogeneous associations of different types of software and materials. In the absence of a tutor capable of explaining the various operations required by each component of the learning space (technical perspective), the risk of cognitive overload is enhanced. A cognitive perspective would stress the difficulty for the learner to manage the required computer skills at the same time as the contents of the learning materials. The role of the user-interface therefore can be defined as to reduce cognitive overload and compensate for learner's minimal technical skills, by keeping all technical aspects in the background. When observing learners' perception of technological mediation, Bertin & Annoot (1997) already pointed to the fact that the computer is felt to be motivating only as far as it remains unnoticed.

Computer availability is a two-fold issue: technology has always tended to increase social gaps between learners (Lancien, 1999) especially because of social inequalities in the access to computer technologies (Tucker, 1999). The question is also raised on a larger scale owing to the fact that distance learning does not as naturally concern learners of developing countries as it does in more developed areas. Issues to be considered when designing distance language learning environments, therefore, concern the degree of exclusion any such environment necessarily entails and the room left for individual and cultural appropriation (Barbot, 2000, p. 89).

For Glickman, using technology raises three closely related questions:

- how to learn the language (materials content)?

- how to operate the environment (technical skills)?
- how to use this environment for language learning purposes? (Glickman, 2002a, p. 195)

This view is supported by Hubbard (2004) and Ducate & Arnold (2006):

As digital natives, many students have excellent computer skills: they can use computers to communicate, locate information, play games, and so forth. However, they do not necessarily know how to use them effectively to learn. Therefore, Hubbard (2004, p. 51) strongly advocates learner training:

I am convinced that most students will profit from some formal, sustained training in how to take operational competence in a given computer application and transfer that into learning competence. We should not release our students into powerful learning environments unprepared. It is our responsibility as teachers to see that they are able to make informed decisions about how to use computer resources effectively to meet their learning objectives. (Ducate & Arnold, 2006, p. 14)

At the same time, Glickman observes that the proportion of learners who can perform on these three levels is reduced. Reducing technological distance could then be reformulated as reducing the gaps between these three skills.

The main impact of the introduction of distance in the language learning situation is to draw attention to a number of questions previously left unasked and raise awareness on a number of issues that will eventually determine its development and efficiency. Two major stakes can be outlined:

- a macro socio-pedagogic level concerning the nature of the shift of paradigm involved in the passage from face-to-face to distance learning, implying new roles for teachers as well as learners, as well as the appearance of new actors engaged in learner monitoring, guidance and counseling;
- a micro socio-pedagogic level which makes it necessary to revisit learning situations and learning modes in computer-mediated distance learning contexts, including the complex combination of human and machine intervention.

A plausible hypothesis would be to consider that real and efficient pedagogic innovation will stem from the articulation between these two levels of a different nature and scale.

Reassessing the impact of distance also leads to reconsidering the relationships between teachers-designers-developers and theories.

Levy and Stockwell (2006), for example, characterize CALL practitioners and developers as mainly consumers of theory developed for other purposes. (…) Egbert & Hanson-Smith claim that *"...educators do not need a discrete theory of CALL to understand the role of technology in the classroom; a clear theory of SLA and its implications for the learning environment serves this goal"(Egbert & Hanson-Smith 2007: 3)* (Hubbard, 2009, p. 3).

What our perception of distance as an analyzer points to is the need to reassess theories and their mutual relationships in order to take stock of those 'hidden' elements of the pedagogic situation revealed in distance learning contexts. This integrative perspective will lead us to consider, in the second part of this book, how the learning process as well as each of the poles of the model can be (re)constructed as a 'real object'.

SYNTHESIS

How has the chapter answered the questions raised in the introduction?

- Is distance learning and teaching a unified paradigm? The concept of distance

learning and teaching covers a variety of distinct situations: correspondence courses, 'web-based' or 'online' learning, also called 'e-learning', hybrid or blended learning… Furthermore, online materials can be designed either as a complement to face-to-face learning situations or as stand-alone activities. In spite of the variety of the modes, what is of particular relevance is their common resort to the notion of distance and how this impacts the conditions and nature of pedagogic mediation.

- How can psycho-sociology help us develop an original perspective of distance? The authors have borrowed the concept of 'analyzer' from Lapassade (1971) and Petit (1991) as a useful tool to study the impact of distance on the language learning situation. This concept, based on the distinction between the establishment (*l'institué*), the challenging force (*l'instituant*) and institutionalization (*l'institutionnalisation*), helps us reconsider the notion of distance. Rather than considering it just a new dimension of the CALL situation, it is shown to be a revelator of dimensions previously 'hidden' in traditional contexts. In this light, it is thought to be an essential condition for a better understanding of CALL issues.
- How can the concept of mediation be described in distance learning contexts? The psycho social perspective developed in this chapter helps us outline three distinct dimensions of mediation. Pedagogic mediation (the process of interaction between teacher/tutor and the learner) forms the foundation of any teaching situation. The integration of technology modifies the existing network of interactions by 'hiding' some of its components or actors behind the screen. Technological mediation must therefore be conceived as a way to reinforce pedagogic mediation. Teacher and researcher expertise are necessary to make sure a technocentric approach will not interfere with the cognitive processes required in second language acquisition. Finally, the introduction of distance generates further gaps between the various actors. Efficient pedagogic mediation therefore relies on a deeper insight into the nature of the interactions illustrated in the didactic ergonomics model.
- What 'hidden' dimensions of the pedagogic situation are revealed in distance learning contexts? While distance learning is commonly associated with geographical or physical distance, this chapter has shown how such dimensions as time, social interaction and technological mediation are also dramatically impacted by distance.

AUTHOR NOTE

Note: quotations originally in French have been translated by the authors. The original text is presented in the end-of-chapter notes.

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ENDNOTES

[1] *Un dispositif organisé, finalisé reconnu comme tel par les acteurs, - qui prend en compte la singularité des personnes dans leurs dimensions individuelle et collective, et repose sur des situations d'apprentissage complémentaires et plurielle en termes de temps, de lieux de médiations pédagogiques*

humaines et technologiques et de ressources.

[2] *L'expansion sans précédent des technologies de l'information et de la communication bouleverse l'ordre du monde en modifiant l'échelle d'impact des choix politiques, économiques et ingénieriques. Aujourd'hui, l'existence potentielle de méta-bibliothèques et de bases de données, ainsi que celle de campus universitaires numériques, ouverts sur la planète entière, interroge fortement le sens des pratiques de formation. Elle met en cause la vision humaine et sociale qui oriente l'élaboration des dispositifs, ainsi que les allégeances, qu'en tant qu'acteurs sociaux, nous sommes prêts – ou non – à assumer en termes de modèles économiques, pédagogiques ou encore cognitifs.*

[3] *…tout ce qui fait surgir la vérité de ce qui est caché ; tout, c'est-à-dire groupe, individu, situation, évènement, scandale…*

[4] *L'analyseur est une machine à décomposer, soit naturelle, soit construite à des fins d'expérimentation ou à des fins d'intervention.*

[5] *La présence physique de l'enseignant n'est pas toujours le garant de sa présence psychologique, de sa disponibilité et de sa capacité d'écoute.*

[6] *La distance la plus difficile à apprivoiser, et que prédéterminent toutes celles que nous venons d'évoquer, dans un système d'enseignement à distance, c'est bien la distance qui sépare celui qui veut ou doit apprendre, et celui qui sait, et veut ou doit enseigner.*

Section 2

Discussing the Model in the Context of Distance Learning

Chapter 3
The 'Language' Pole

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INTRODUCTION

In this chapter, as in the previous chapter, the authors face a 'linguistic' dilemma: in French there has long been an easy distinction between language (a human faculty), langue (a tongue/a code) and parole (speech/discourse) (see Saussure, 1972 edition). This distinction can be maintained in English on a conceptual level, but the choice of the words to express it does not necessarily reflect ordinary everyday ways of speaking. As a consequence it may seem to reflect a fine theoretical construction that has little relevance to basic language learning. Our assumption is that understanding the implications of this distinction is of paramount importance.

OBJECTIVES

In this largely theoretical chapter, the objective is to try and find operational answers to a number of questions:

- What is the link between language, culture and content?
- How can the nature of this link be reflected in our understanding of language and cognition and of plurilingualism?
- What psycholinguistic evidence supports our views?
- Are reading and writing processed the way listening and speaking are?
- How is language now seen to be processed?
- How are levels of attainment seen today?

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The answers to these questions will have implications for language learning. In the first part of the chapter, the readers can try to answer these questions and to compare their answers with the position held in the book (see "Synthesis") and can then make a list of the implications for learning (in terms of situations, content, activities and curriculum) and can compare their list with the one given in the book. A discussion among readers of the differences may prove very constructive.

'LANGUAGE' AS A CONSTRUCT IN A SYSTEMIC APPROACH

Some researchers see language as a technology (Auroux 2001, p.175) which helps us to design and conceive our interactions with others. This may go against its strong association with human identity that is now postulated.

Language is the place where actual and possible forms of social organizations and their likely social and political consequences are defined and contested. Yet it is also the place where our sense of ourselves, our subjectivity is constructed. (Norton, in Seidlhofer 2003, p. 241)

We will see in this chapter that there is no way we can avoid tackling this contradiction between the practical and the symbolic, the abstract and the concrete, the affective and the cognitive, the individual and the social.

We will not consider the debate as to whether language is an innate or a constructed faculty because as far as distance second language learning is concerned, it is no longer relevant (Gaonac'h, 2006) but we will have to see whether language processing is a specific, modular faculty or whether it is part of one general cognitive faculty.

Initially, language (le langage) may not have been constructed to facilitate thinking, which would result more from communicative needs that language was eventually able to fulfill, but today language more or less structures the way our thinking is organized even if, in our everyday use, it is still determined by our need to communicate. It could be said that our brain is genetically adapted for the production of language, but for each individual human being its development will be the product of the social interactions s/he has been involved in and it will become the locus for the construction of his/her subjectivity (LeDoux, 2003). Some go even further and postulate that language and consciousness cannot be differentiated (Bakhtin, 1977) because it is difficult to imagine consciousness without language. This may explain why many monolingual humans seem to be initially puzzled when they come across another tongue, a concept to which we will return when we deal with nativization, or assimilation, in Piaget's words (1970).

What we have called tongue (une/la langue) may be seen as one objective result of the faculty of language, but as soon as we speak of a tongue and describe it we enter the realm of abstraction, the result of determined cognitive procedures (Bakhtin, 1977) and run the risk of confusing the description with what is described, and therefore of believing that the categories that are used in the description correspond to the internal cognitive organization that leads to the production of language. This explains why so many learners believe that learning the words and the grammar rules of a given tongue (langue) will lead to effective performance in that tongue. This belief may be counteractive.

For Saussure (1972 edition), language (langage) was the privileged container of collective representations and beliefs, the means by which human knowledge was maintained, transmitted and altered. Habermas (1995) adds that language acts as a mediator of collective activity. One obvious consequence is that what we know and what we believe are closely related to the organization of the world that the language of our education has given us in a specific culture. Another form of language may organize the world differently

and learning this second language may then necessitate a cognitive and cultural reorganization of what we know which may initially cause some problems.

As mentioned earlier, the need to communicate anticipates the recourse to language, the role of which is to enable us to exchange messages whose content is already stored in a way that does not necessarily reflect the way our interlocutor has stored it. This content (informational, affective, disciplinary, or scientific) matters more than the linguistic forms used to express it. This fact is often overlooked in language teaching and learning which may be problematic for some learners who are not "good language learners" (Ellis & Sinclair, 1989) but are more competent in the domain of interaction. However, the norms of the chosen langue (tongue, code) used facilitate the interaction culturally, cognitively and socially and ignoring them is not without consequences for the person concerned, whether this is done voluntarily or not.

Since content, however, is what is prominent, content should be given priority and its social validity and reality in a given culture should be the guiding elements in second language learning and teaching. The change in cultural and linguistic systems will create gaps in the exchange: noticing these gaps, coping with them and adapting the learning process to solve the problems they cause is what the learner should be able to do.

We can conclude this section by referring to chapter 1 and by stressing the fact that two relationships are indissociable. Language, tongue and speech or discourse cannot be isolated from each other. This section has shown that language, culture and content cannot be dissociated either. Bearing that in mind will prove a real challenge.

CULTURE

Lamy and Hampel (2007, p. 58) warn us that the notion of 'culture' as an essential attribute of individuals and groups, dependent on a common national or ethnic background is not helpful to the project of understanding how diverse participants in virtual learning environments (VLEs) individually or jointly construct a culture of interaction. Referring to a position now shared in the field, they propose an alternative conceptualization of culture as the result of negotiations among participants in a given human institution or projects (in their case, a virtual learning environment (see Goodfellow and Hewling 2005, p. 355), which corresponds to what intercultural researchers would say. However participants in exchanges in temporary settings initially belong to one such national or ethnic background or to a complex set of backgrounds. It can help to understand what this implies.

Culture can be seen as a complex and integrated pattern of human behavior (including expected behaviors), thoughts, interactions and manners of interacting, language(s), practices, beliefs and representations, values, customs and rituals, roles and relationships of a racial, ethnic, religious or social group as well as the capacity to transmit these data to the next generations (Porcher, 1981).

As a consequence, language is not only part of how we define culture, it also reflects culture as shown in the debates over the Whorfian hypothesis (Whorf, 1956). The culture(s) associated with a given language (langue) can often be seen in celebrations, folk songs, or customs of the countries in which the language is spoken, it is a broader phenomenon which will be finely reflected in the input in second language courses and will influence the output. The study of languages causes a confrontation with the cultures that use those languages and real proficiency in a language cannot be attained without acceptance of the differences with the learner's initial cultural background and language nor without adequate knowledge and understanding of the cultural contexts in which the language is spoken as shown in intercultural studies (Kramsch, 1998), and we will see that this is likely to meet with some unconscious resistance.

If the Whorfian hypothesis is accepted, in its weak or strong form, linguistic competence alone is not enough for learners of a language to be competent in that language, a fact which has been highlighted in Europe by the Common European Framework of Reference for Languages (CEFRL) (Council of Europe, 2001). Learners must be sensitized, for example, to the culturally appropriate ways of behaving in different contexts. This implies understanding that behaviors, intonation patterns and phrases that are appropriate in their culture may trigger different responses from speakers of L2, and if learners of L2 aim at successful communication, they must adapt to their interlocutors and remain comfortable with their own values nonetheless. Integrating culture in a curriculum is not an easy task, as we will see in the following chapters.

CONTENT

Language production is not an end in itself. Interactants have an objective which results in the negotiation of meaning, on a given subject, in a precise field, in order to gain something (Narcy-Combes, 2005). Our assumption is that this should remain the case in language learning activities, which leads us to try and see the influence of content on the use of L2.

Eisele-Hendersen (2000) refers to two thresholds: contextual specificity (contextual authenticity with a basic level of coherence and interlingual development: proficiency gap). As a consequence, demanding requirements in terms of content will result in qualitative losses in terms of language form(s) (accuracy). At lower levels of proficiency, utterances may then be constructed with disciplinary concepts used as labels without the adequate syntax and forms required in such discourse. Discourse remains coherent, but language cohesion cannot be maintained. Interaction will be made more difficult for the interlocutor(s) who must reconstruct the cohesion thanks to their knowledge of the given field.

Learning skills are not affected by the change of language and may compensate for language difficulties.

Advanced mastery of the content leads to better mastery of the rhetorical structures of the answers in fields in which cultural differences do not influence these structures to a great extent. Automaticity and fluency of L2 production depend more on instances than on lexical or morphosyntactic units (see chapter 4), which may explain the great influence of familiarity with the content on performance. Such familiarity favors instance-based production (Bygate et al., 2001).

Familiarity with content generally increases fluency, but neither accuracy nor complexity (Bygate et al., 2001). A learner who is well read in a given field will sound more proficient in L2 in that field than a specialist of L2 (a teacher for example) who is ignorant of the domain (which does not mean that the domain specialist can then teach the language specific to this domain, as is sometimes the case). Evaluating L2 proficiency in a given domain should then mean assessing the effects of knowledge of the domain on the results so as not to generalize a level of competence specific to one domain to all domains.

Frames and scripts are easily transferable from L1 to L2 in specific domains only (Pacteau, 1999). In testing based on real-world situations (cf. Isani, 2003), for example, scenarios are taken from varying domains: it is important to see how this can affect learner performance. As a conclusion we may say that evaluation based on content favors the learners specialised in that content, which is an obvious bias if it is not taken into account in the description of the results.

A clear distinction will be required between performances in the content (scientific disciplines or other domains: literature, art, hobbies, etc.), intertextual or pragmatic performances, and linguistic performances, to grant a modular

certification that meets the requirements of the certifying institution and of the learners' intended professions. Performances will differ, for instance, if one must assess the level of a scientist, an interpreter or a would-be teacher. One can think that more attention will be paid to:

- Content for the first evaluee, the scientist, since knowledge of content will compensate a low level of language proficiency (see above).
- Content, but also intertext and pragmatics for the second evaluee, the interpreter. Treatment of content must be adequate, but if intertext and pragmatics are respected then a L2 specialist of the field will be able to understand.
- An LSP teacher could be expected to master all the above-mentioned elements.

What has just been seen shows that prior knowledge of disciplinary content has a positive influence on performance in L2, it can speed up the learning process, however, teaching new content in L2 may not prove so beneficial.

A study of immersion classes, bilingual schools, and CLIL (content and language integrated learning, (see Dalfon-Puffer, 2007)) courses shows that results are not always convincing when content is introduced and taught in L2 as a way to learn L2 (aural and written comprehension reach high levels of competence but a classroom pidgin may result where production is concerned (Dalfon-Puffer, 2007). These programs were implemented because language learning in school settings was often seen as unsatisfactory, especially in the learner's command of oral registers. Their aim was and still is to convert parts of school life into a naturalistic environment, where the weak points of the foreign language classroom can be overlooked, language is both the subject and content. It is the medium through which other content (e.g. geography, history, business studies etc.) is taught. CLIL classrooms are seen as environments that provide opportunities for learning through acquisition rather than explicit teaching.

The language-related objectives of CLIL, on top of the subject matter, are generally hardly specified: with phrases such as "enlargement of the lexicon", and "increased oral fluency" being recorded (Dalfon-Puffer, 2007). Before, the medium of instruction was L1, consequently the relationship between language and content is not well-informed and little is known on how disciplinary content is constructed through basically oral activities.

The results are not without ambiguity. Tense and conflicting feelings concerning the primacy of one aspect over the other have been felt (Dalfon-Puffer, 2007). Teachers have expressed two fears: (1) L2 may slow down proceedings to the extent that less content will be studied and (2) lower language proficiency may cause reduced cognitive complexity of the subject matter. (1) and (2) are not without foundation, see above).

Basically, further investigation is necessary to validate the claim that CLIL lessons enhance the student's communicative competence in the target language, in particular clear indications on the kinds of "comprehensible output" that would be beneficial to the development of L2 are necessary. The development and success of immersion classes in Canada and in other very specific areas (Val d'Aosta, see Gajo, 2001) have largely contributed to the development of CLIL in other contexts, but their initial contexts are very specific, and the influence of contextual variables requires further research.

We will see later that after a certain age, it is difficult to define "natural" conditions under which L2 is used and to ascertain whether they would provide the best situation for adolescents or adults to acquire L2. However content must be taken on board (cf. the transductive relationship described above), what has just been described suggests a tandem approach (content being introduced in L1 by a content specialist, but complemented by tasks based on disciplinary texts in L2 tutored

by an L2 specialist, adjunct CLIL rather than full CLIL, see Dalfon-Puffer, 2007, or Liebenberg, 2008). Distance language courses can adapt to such requirements and assess how contextual parameters are likely to influence learners in a given CLIL course.

LANGUAGE AND ORDINARY COGNITION

A major question today, at least in the European context, is to know whether language is processed by a specific module and/or whether communicative/linguistic competence (with distinct sub-competences, codes and varieties) results from the addition of many monolingual competences or from a single plurilingual competence (Randall, 2007).

Plurilingualism in the European Common Framework of Reference and European Research

In recent years, plurilingualism has taken an increasingly dominant position in the field of language learning in Europe and in other areas where many languages are in contact (Coste, 2001). Plurilingualism applies to a learner who can use more than one language and multilingualism to the co-existence of many languages in a given community (Council of Europe, 2001).

Multilingualism can be attained by offering more varied language learning opportunities in a school or a given educational system, or by encouraging learners to study more than one foreign language which may imply attempting to reduce the dominance of English in international communication.

The plurilingual approach stresses the fact that as the language experience of an individual develops in his or her cultural context from the language of the family to that of the social group and then to the language(s) of other groups (either at school or naturally), he or she does not store these languages and cultures in separate parts of the brain but develops a global communicative competence which is fed by all his or her experiences and in which all the languages are correlated and interact.

In different situations, a speaker may resort to the different elements of this competence in flexible ways to communicate with a given interlocutor. Interlocutors may switch from one language or dialect to another, each of them making use of their respective capacity of expression in one language and of comprehension in another. Knowledge of different languages may help an individual to go through a written, or possibly oral text, in a language supposedly « unknown » by recognition of words belonging to a common international store despite the influence of the unknown language on these words (intercomprehension of Roman or Germanic languages in Europe, for instance, see Causa, 2002).

In natural settings, this kind of mutual mediation may result in communication based on many languages, oversimplified forms and mimics and gestures to reach the common objective. This plurilingual approach radically changes traditional conceptions of what it means to learn a language, it breaks with the objective of mastering two or three different languages learnt separately the one from the other in order to reach native-like competence. The aim in such an approach is to develop a repertory of languages in which all language competences are developed jointly but with diverse results in each given language. This implies that institutions should offer a varied choice of languages to enable learners to develop a truly plurilingual competence. Besides, if we accept the fact that learning a language is a lifelong activity, what matters most is to foster motivation, capacity and the confidence to face a new language experience outside the world of formal education. Therefore educational authorities have a responsibility that goes beyond the certification of a level of performance at a given time.

So far, the teaching and learning consequences of this position have not all been explored. However, the recent development of the language programs of the Council of Europe has attempted to favor the production of tools and materials that would promote plurilingualism among all the members of the language teaching profession in Europe.

The European Portfolio makes it possible to record a person's intercultural and language learning experiences independently of their degree of formalism so that they can receive formal recognition.

To that purpose, the CEFRL not only provides levels for assessing a general competence in a given language but also an analysis of the use of that language and of language skills that will make it easier for teachers to define objectives and describe levels in all the skills with reference to varied objectives, and with the characteristics and resources of the learners.

A plurilingual and pluricultural competence is defined (Stratilaki, 2006) as the ability to communicate with language and to interact culturally of an individual who masters many languages at varying degrees and has the experience of many cultures and can manage the whole of this acquired language and cultural capital. Coste (2001) adds that similarity between the competences does not characterize plurilingual competence which is characterized by a differentiation between the distinct components of a global competence. Psycholinguistic data that confirm this now strong position remain to be found and research needs to be carried out to see how to implement it without any of the negative consequences that can be attributed to diglossia or polyglossia.

Diglossia and Polyglossia

Diglossia is a fairly well-known phenomenon, it is a context where a given language community uses two languages: the first is the community's present-day dialect (vernacular) and the second may be an older or a more elaborate version of that dialect (cf. Arabic, Czech), or a distinct yet closely related variant (eg: Hochdeutsch) (Causa 2002). Diglossia may have serious implications on the acquisition of other languages as we will see. Polygossia applies to countries where at least three « languages » co-exist with a complementary distribution based on functional criteria. Contrary to multilingual societies there is a clear-cut functional distribution which is not based on the relative prestige of the different languages. Countries like Luxembourg (Luxemburgish, French, German, Portuguese and English) and Singapore (Mandarin, Bahasa, Malaysi, Malay and English) are contexts of polyglossia.

Context

The complexity of plurilingual, diglossic or monolingual contexts and their effect on L2 acquisition are such that they must be analysed with well-adapted tools in order to go beyond traditional analyses based on one or two clearly-defined languages (what is the mother tongue when more than one language have been spoken since infancy?).

It is not the objective of this book to study these phenomena in depth, but an awareness of what they imply may facilitate the implementation of distance courses especially in making the course tutors aware that support for some learners will benefit from an understanding of their plurilingual competence by providing adequate advice and specific approaches.

The macro context includes social characteristics such as language and educational policies, educational systems and the historical and present-day status of the languages concerned. The micro context covers the local level of the situation observed.

A homoglot context is a context where the L2 to be learnt is spoken, while it is not spoken in a heteroglot environment. This distinction is not always clear in distance language courses,

the present writer recalling the case of a French learner of English in a French distance course who, in fact, happened to be in London.

Other distinctions can be made concerning context: natural and institutional, guided or unguided, individual or collective. Such distinctions do not apply readily to distance learning. Time (contact time, learning phases, personal history of learning L2) will also have to be analysed differently in the context of distance language learning as will the notion of individual and collective work and interactions.

Code-Switching

The term code-switching refers to the use of more than one language or variety in a given conversation. Bilinguals have the ability to use elements of both their languages when interacting with other bilinguals. Code-switching may occur between sentences (intersentential) or within a single sentence (intrasentential) and may be more or less phonologically or linguistically adapted depending on the degree of bilingualism of the speaker. Code-switching is now considered as a normal and natural product of interaction between the bilingual (or multilingual) speaker's languages (Causa, 2002). It can be seen as evidence of how language is processed by bilingual speakers, or as a communicative strategy to compensate for occasional difficulties in contexts where it is possible. It can also be a way of stressing one's identity.

Sociolinguistic studies show that code-switching may delineate the borders between language communities and social groups. Causa (2002) states that distinguishing between code-switching, borrowing, lexical assimilation and mixing languages is not always easy.

Cummins (1994) among others, draws a distinction between additive bilingualism in which the first L1 continues to be developed and Culture 1 (C1) to be valued while L2 is learned; and subtractive bilingualism in which L2 is added to the detriment of L1 and C1, which no longer develop as a consequence. Research suggests that learners working in an additive bilingual environment are more likely to succeed than those whose first language and culture are devalued by their schools and by the wider society. Potentially subtractive bilingualism may lead to a form of refusal of L2 as well. Depending on the individual learner's context or on the general context of the course, this may play a very important role and must be assessed prior to a course.

PSYCHO- AND NEUROLINGUISTIC EVIDENCE OF A UNITARY COMPETENCE

Introduction

In Europe in particular, researchers in language learning refer mainly to sociolinguistic evidence to base their definition of plurilingual competence (cf. Coste, 2001). However, the term competence, or competency, also refers to psychology and in our case to psycholinguistics. According to Randall (2007, p. 121), evidence from research would imply that different areas for processing L1 and L2 do not exist except in the case of the lexical stores. Randall adds (2007, p.122) that extra resources are needed by L2 learners to process L2 at an early stage, but that this will be reduced with progress in L2.

Interestingly, according to Randall the separation of lexical storage between L1 and L2 justifies renewal of interest in translation and code-switching, since the interaction between the two languages is not without processing capacity costs. Cognitive overload has long been said to result from learners trying to use higher order, top down processes in L2 comprehension and production (Gaonac'h, 1990) and translation, code-switching and rote-learning might be assumed to reduce the processing costs (Randall 2007, p. 123).

Prototypical and associative networks also

provide models for explaining the way that words are stored and retrieved, indicating the role played by frequency (prototypicality) and connectivity (associative networks) in the mental lexicon, and these models may be of use when building specific tasks. Nativist arguments (Gaonac'h, 2006) question the difference between L1 and L2 acquisition. Since Lenneberg (1967), the concept of critical age has often been put forward. After that age, the Language Acquisition Device would no longer be operative and the L2 would then be learnt through the general cognitive system. It is not important to conclude as to whether it is a specific age or a longer period in which cognitive processes become so much more efficient than the purely implicit natural learning of L1 and L2 that a natural approach would in fact prove counter-productive (Gaonac'h, 2006). In the situation of second language distance learning learners will all be beyond the critical age.

Quite a few models are based on common information processing systems for all types of information and are not language specific (MacWhinney's Competition Model, 1987, and connectionist language models, Ellis, N., 1993). There is evidence that the pathways are similar in L1 and L2 (Randall 2007, p. 50).

Randall writes (2007, p. 27) that "it is not impossible to speculate that the development of such a sophisticated device as the Working memory in humans is primarily related to language processing", and this goes against modular theory.

According to the same author (2007, p. 39) the ability to make immediate sense of incoming language stimuli depends on the attention to data which is specific to language and the rejection of other data as well as the extraction of salient information from this specific data to create language "symbols" from the raw physical input.

The question is to know whether the salient features are learnt or innate.

According to Ledoux, innate features would not really differ from constructed features (2003) they would simply be pre-programmed neural connections. If the neural connections that allow these processes are similar in both cases, it is easier for us to accept Randall's view that, at times, a unitary view will provide a better explanation, while at other times the concepts derived from the modular approach will supply better metaphors with which to explain the observed processes.

A modular route will separate language data from other data and will include a phonological module/a syntactic module and a semantic module that could be in the first route (Randall, 2007, p. 41). Reference to other influential authors will make us lean away from a modular approach connected to innate linguistic abilities.

Piaget: Assimilation and Accommodation

Piaget (1970) was one among other authors reluctant to think that humans were born with specific innate linguistic abilities. He saw the brain as a homogenous computational system and language acquisition as part of general learning. This development may be innate, but for Piaget this does not imply that there is a specific language acquisition module in the brain (cf. Ledoux, 2003). He postulates that external influences and social interaction trigger language acquisition: data collected from these sources construct symbolic and functional schemata (thought or behavioral patterns). Cognitive development and language acquisition are life-long active processes that keep updating and re-organising schemata. In Piaget's theory (1970), children develop L1 as they build a sense of identity in reference to the environment, and phases of general cognitive development can be delineated, with systematic changes of processes and patterns with age. Piaget assumes language acquisition is part of this complex cognitive development. The changes will initially start with assimilation (adaptation of the new data to the existing organisation of knowledge), followed by accommodation (alteration of the original organisation of knowledge to fit the new data),

this has influenced Andersen's (1983) description of nativization and denativization as we will see in the next chapter. These concepts are clearly validated as far as phonological phenomena are concerned (Dupoux, 2001) as will be seen in the next chapter.

Writing and Reading

Reading and writing cause specific problems, and task design will rely on these specificities especially when writing in L2 is alphabetical (see Randall, 2007 or Gaonac'h, 2006 for further development).

Decoding Prints: Processes of Word Recognition in a Second Language

One issue is to understand how features are extracted from the incoming visual stimulus (script) and how they are converted into meaningful units (which may not necessarily be words).Different models are in competition.

In one model (Randall, 2007, p. 55), the process for word recognition was seen to imply a serial process:

- the Iconic Memory extracts features from the visual input (letters, words?);
- the Iconic Memory converts the features into meaningful linguistic units;
- these meaningful units are combined into longer chunks in the Working Memory.

This model may seem insufficient to explain the speed and meaning-based processing of reading.

In the search model (Forster, 1976), words are stored in the mental lexicon in a "master file" which is accessed via a series of access files (a phonological file, an orthographic file and a syntactic and semantic file).

Within each access file, words are stored in decreasing order of frequency, and each file is searched from top to bottom in order to find a match between the incoming data and an entry in the file which provides a pointer to the lexicon (master file). This master file contains all the information about the word. The selection in the mental lexicon will be confirmed if it fits with the information stored in the syntactic/semantic file.

The Logogen Model (Morton, 1969) is a "direct-access" model that has common features with connectionist approaches. Each word in the lexicon has its own individual entry. Access to the semantic store is direct. The brain compares the input from the printed word with the entry of that word in the memory. Identifying a word will be possible if enough information about the word is received. A central concept, the logogen, is defined as an "information-gathering device" or a specialized recognition unit. Logogens are able to recognize each specific word by taking into account the effects of context on their recognition. Examples of logogens are given by Randall (2007, p. 57):

- follow: verb / SVA / to go after, needs less input (highly frequent);
- fellow: noun / + human informal, needs more input (less frequent);
- fallow: adjective / + agriculture / No crops, needs large input (highly infrequent).

This model seems potentially more fruitful in terms of task development and is completed by the following model.

The Interactive Activation and Competition (IAC) model (McClelland and Rumelhart, 1981) is related to a connectionist approach and derives from Morton's model. Two new ideas were added to the basic logogen model:

- hidden units (nodes) can be defined which take part in the processing of language in order to turn physical features into symbols;
- the nodes can have two types of effect on the other nodes of the system: an excitatory

effect or an inhibitory effect, both are linked with word frequency.

These models can help us understand certain problems in reading and writing. If they do not give clear-cut solutions to tasks design, they help us see that some tasks could be based on the concepts of excitatory and inhibitory effect.

Automatization of Word Recognition Processes

Three questions can be defined about the ability of an L2 reader to automatize the word recognition processes (Randall, 2007, p. 54-85):

- What features are salient, given that script systems may differ from the native language to the foreign language?
- Are the processes involved in feature extraction different from one script system to another, if features are considered script-specific?
- How can processes become automatic to reduce the more important processing cost in working memory in L2 if features are script-specific and not universal?

Word recognition can be holistic or analytic. Words can be accessed (1) through a whole image as in the logographic system, (2) through syllables (as in syllabic systems), or (3) through letters (as in phonetic systems).

The dual route theory postulates two separate routes to recognize a word in English:

- a whole word route (lexical route);
- a phonological assembly route (non-lexical route), where it is possible to convert the letters (graphemes) into sounds, without necessarily understanding the word (problematic in L2, even when the script is identical since letters do not necessarily correspond to the same sounds in L1 and L2).

This model would involve:

- a grapheme to phoneme store which contains the rules for converting letters into sounds;
- an orthographic lexicon which contains individual word logogens (= representations of the written form of the words);
- a phonological lexicon which contains representations of words as sounds;
- a semantic store which contains the meaning of the words (this store is accessed either from the orthographic lexicon in the case of reading printed words, or from the phonological store in the case of writing words from dictation).

Phonological representations are thus assumed to play a role in reading and writing, and we will see that this plays a role in tasks in which spontaneous production of written discourse is assimilated to production of oral discourse (see chapters 4 and 11).

Processes in the Dual-Route Model

The phonological assembly route is called the grapheme-phoneme conversion route (GPC). In this route the reader assembles letters to make sounds in his mind (difficult when letters and phonemes do not correspond in L1 and L2) (Randall, 2007, p. 74):

- the direct lexical route wherein words are recognized as complete units (the reader identifies the shape of the word). The meaning is then recognized in the semantic store;
- a "direct non-semantic route", which takes into account the possibility of reading without understanding the meaning.

These processes have specific consequences on word recognition for the L2 learner: high process-

ing cost in the working memory, concentration on forms rather than on meanings (Gaonac'h 1990), lack of attention to the general schema or the aim of the text, or insufficiently automatic basic feature recognition. Specific training should then be provided to overcome these consequences.

Some issues remain unanswered concerning the differences between L1 and L2. They are connected with the influence of initial literacy on word recognition in L2, of the features of the orthographic system on word recognition in L2 and of the use of another script system in second language learning. Initial reading tasks should then be developed to measure the effect of these influences on each learner at the onset of a new course.

Context will play a role in word recognition. Two types of contexts can be defined: (1) the wider context and schema within which the word and text are based, and (2) the immediate linguistic context. As has been seen above, L2 learners will experience difficulty in using the context because of cognitive overload and resulting lack of storage capacity. The L2 learner needs to pay attention to both content and function of the words and to use syntactic rules in a conscious way while lacking automatic word recognition strategies. This will require specific training to help the learner reduce the cognitive load.

According to Randall (2007), there is neuroscientific evidence to support the dual route model, but no straight answer. The dual route model is a relevant framework for understanding word recognition processing in L2. Experimentation shows that reading is not the same in L1 and L2. The model provides an explanation of the difficulties in reading in L2 (lack of capacity in the working memory). It makes it possible to consider the effects of the script system and of the orthographic system in word recognition processing and sensitizes us to the fact that L2 learning has to take into account the cognitive processing differences between L1 and L2.

A universal model of the processes involved in reading for all languages does not yet exist. Models depend on the type of script system (alphabetic or logographic), and learning contexts and individual learners will determine what course of action should be taken, which in the case of distance education will prove difficult, even if reading and writing are often taken for granted at that stage.

General language production proves to be a more complex problem which will not be studied in such detail as the literature seems more readily available.

Dual-Processing System of Language Production

Language production is now often seen as the result of a dual processing system that combines rule-based production on the one hand and exemplar-based production on the other.

Rule-based production, is now largely associated with Anderson's adaptive control of thought (ACT) model (1993) and Levelt's model of speech production (1989), whereas exemplar-based production is connected with Logan and the connectionist model, see above and Nick Ellis (1993).

Logan has proposed a theory of automaticity that gives two ways in which an action can be executed. It may be done (1) using a step-by-step algorithm (similar to Anderson and Levelt) or (2) by simply recalling the appropriate steps from memory. The former is used for actions that are new or unfamiliar, but each time the action is done a memory for it is created (a connection). That connection may be used the next time the action is required. Once one memory is stored, the next time that the action is necessary, it may be performed by either performing the algorithm or by retrieving a memory of previously performing the action. Or "a previous performance of the action."

Both models are now seen as complementary, see Ellis (2003) or Skehan (in Bygate et al., 2001), which is in accordance with Logan's description of his model (1989).

The research on learning strategies (Oxford, 1990, for instance) has shown that learners may prefer one way or the other. Courses and tasks should then be developed to facilitate restructuration by making it possible for learners to work in the way best adapted to their personal aptitude. The implications for language learning will be developed further in the following chapter.

Learner Language: Levels and the Myth of the Native Speaker Usage and Facts

So far, very little has been said about how far learners can go in their progression in L2. (Ellis 1994, Council of Europe, 2001).

The concept of incompleteness of L2 acquisition (Schachter, 1990) and interlanguage theory (Selinker, 1972) have long sensitized researchers and teachers to the need to adapt their objectives to the learners' proficiency when they enter a course and to propose attainable objectives. Institutionally, this has now been taken on board by the Council of Europe and the various levels of competence described in the Common European Framework of References for Languages (Council of Europe, 2001). The CEFR Council of Europe, 2001L provides sociolinguistic evidence of how a unitary language competence leads to language productions that fulfill socially acceptable functions at different levels of attainment, which goes against the myth of native speaker usage (Jenkins, 2007). This is what Lamy and Hampel (2008, p. 59) have in mind when they quote Lemke's view of identity as 'performance', and his opposition to the conventional model of language learners as monoglots seeking to become 'fluent' in an idealised L2.

Does this mean we follow what Crystal (2003), Jenkins (2007) and others have advocated in the case of English as a lingua franca? These authors stress the mutual intelligibility of input and output rather than its close adaptation to one of the traditional standards of English. Similar works can be found concerning other languages. Jenkins (2007, p. 203) goes as far as saying that … "the British brand of English that is so energetically promoted is not always what the world actually wants" and she proceeds to give the example of Korean Airlines choosing a French flight simulator because its "offshore" international English was more comprehensible.

We have a slightly different position which is closely related to the context in which we teach and research: input should preferably be connected to one accepted variant of English in relation with the course, or the learner's objectives, while making sure that such a choice does not make subsequent development too difficult for the learner. Sole reliance on international "offshore" input might make it difficult for learners to restructure L2 phonologically and/or linguistically at a later stage if they require it. We will agree in terms of output and ensure that mutual intelligibility is the criterion of acceptance (at different levels of proficiency) and not conformity to native speaker norms. When English is concerned, except in very specific crash courses for professionals with immediate demands and limited time, we will always suggest that input should not be limited to non-native speaker productions for fear of dividing the world into two categories of speakers of English, those who abide by native speaker norms and those who do not, since in some areas of power this may be detrimental to democracy. As far as output is concerned, this position requires that accommodation skills be described and acceptability limits defined.

L2 learning will then be defined by a whole range of objectives from multicultural (or cultural) models to L2 for very specific purposes. Depending on the context of the course, it will be important to assess how attainable these objectives may be.

SYNTHESIS

In this chapter we have seen that our understanding of theory leads us to postulate that learning and production of L2 are the result of two indissociable relationships that operate jointly: "language, tongue, speech or discourse" and "language, culture, content". Learners who ignore this fact tend to believe that learning the words and the grammar will suffice.

According to the Whorfian hypothesis (Whorf, 1956), language expresses culture but it is also a reflection of culture. Learning L2 is a cultural phenomenon as well as a linguistic one even if integrating culture is not an easy task in institutional language courses (Beacco, 2000). The varied origins of learners in distance courses may provide new opportunities in terms of cultural integration and the notion of the co-construction of culture in interactions will sensitize learners to cultural differences and their influence in the learning of L2.

Content has been seen to facilitate the learning of L2 when learners are familiar with it. Full content-based courses may not be totally effective in some contexts where bilingualism is not the rule, but cooperation between the content teacher and L2 teachers or tutors (adjunct CLIL) may prove very beneficial and distance language courses may gain from them.

The concept of plurilingual competence, calling upon a learner's general language learning experience, is methodologically appealing. Sociolinguistic evidence supports this approach which has enough psycholinguistic validity to justify the implementation of courses relying on it, if research to validate it is carried out in the process. Diglossia and polyglossia, which sometimes go with plurilingualism, have been shown to have counterproductive consequences in some cases. Contextual influences on language learning must then be assessed for each individual learner and the appreciation of the role of code-switching revisited in language pedagogy.

If psycholinguistic evidence of the non-specificity of language learning is not totally complete, Ledoux's assertion (2003) that there is little difference in terms of neural connections between innate and acquired faculties will make us lean towards non-specificity. Piaget's position (1970) on assimilation and accommodation processes that are clearly validated as far as phonological phenomena are concerned leads us in the same direction. This position will have clear methodological implications especially in terms of proactive or reactive monitoring.

Reading and writing are not to be taken for granted since they are likely to play a greater role in distance language learning than in other language courses and computer-mediated communication (CMC) often relies heavily on these skills. A perusal of the theories that describe the processes of reading and writing opens the way to specific tasks that will be described in later chapters.

Speech production is now often postulated to result from a dual processing system. The rule-based system is more closely related to traditional beliefs whereas description of the instance-based system may cause resistance among traditional teachers. However quite a few learners have not been able to restructure their L2 successfully in rule-based approaches. It would then seem appropriate to offer them an alternative, especially as research in strategies (Oxford, 1980) seems to indicate that some learners do prefer this sort of global approach to learning.

Positions have slowly changed concerning levels of achievements, and the work of the Council of Europe in particular has reversed the trend as far as native-speaker likeness is concerned. Despite our theoretical agreement with such a position, we would advocate that input should be carefully selected in terms of standards in order not to hinder restructuration of L2 should a learner feel the need for it. Output is a different case and its assessment will depend on many contextual and individual factors.

Language classes can result from a broad range of objectives and research can inform us as to how attainable these objectives are. This will be reflected in the expected levels of achievement and should not be overlooked in curriculum and syllabus design. Curricula have been shown to reflect institutional decisions as well as interaction with the learners. They should preferably be based on social situations relevant to the learners' needs and lead to real-world activities that are meaningful to the learners, which justifies approaches such as CLIL and a closer interest in the different types of language that input should reflect.

IMPLICATIONS FOR LANGUAGE LEARNING

Studying language as a construct in a systemic approach led us naturally, so to speak, to think that the actional approach of the Council of Europe (2001) and Task-Based Language Teaching (TBLT) (cf. Bygate et al, 2001, Ellis, 2003, Willis and Willis, 2007) could answer some of the questions that came up, since both seem to provide solutions that take into account the sometimes conflicting theoretical demands we have studied.

Social Situations

From what has been seen above, our position on the organization of language learning courses will now be more easily understood. Since content in a given cultural environment is what triggers the recourse to language, it is probably wiser to determine the various social encounters and tasks which the learners will have to face and to record the corresponding language situations that will provide the initial input for the learners. We will see later that ensuing language-based or socio-cultural needs will be determined from the initial work provided by tasks designed as realistic replicas of these social situations.

Real-World Activities

Social situations listed in the curriculum will be converted into tasks (Ellis, 2003), activities that are socially meaningful for the learners and based on content that seems relevant to the learners. The question of authenticity will be taken up in later chapters. The difficulties the learners will encounter on their way to succeeding in the tasks will help them to become aware of what has to be noticed and practiced in order to reach their objectives.

Curriculum as Interaction

Curriculum development is the systematic planning of what is to be taught and learned in institutions (courses and programs). In many countries, these curricula can be found in official documents (curriculum "guidelines" for teachers) and made mandatory by departments of education. A curriculum focuses on what is to be taught and when, leaving it to the teachers to decide how this should be carried out. Curriculum content and methodology are not always easy to distinguish. Therefore distinctions have to be made between the official or planned curriculum from the de facto curriculum, the way in which what is actually learned is organized.

Extensive work on curriculum development has been carried out in the past 30 years (Grenfell, 2000) and we will not go further into the subject. Let us say that curricula can be seen as guidelines for the organization of courses (such as the list of social situations and expected language outcomes), but not necessarily as inventories to be scrupulously followed, in the same way as syllabi, cf. the Threshold Level, (Council of Europe, 1975). Misconstruing the role of curricula and syllabi may result in the mere rote learning of set phrases and grammar exercises.

The Common European Framework of Reference for Languages (CEFRL) (see above) is an influential outcome of curriculum development. It

was put together by the Council of Europe as the main part of the project "Language Learning for European Citizenship" between 1989 and 1996. Its main aim is to provide a method of assessing and teaching which applies to all languages in Europe. In November 2001, a European Union Council Resolution recommended using the CEFRL to set up systems of validation of language ability. The six reference levels (see below) are becoming widely accepted as the European standard for assessing an individual's language proficiency. Nonetheless, traditional naming conventions, e.g. "intermediate", are still often used.

Initially, in 1991, the Swiss Federal Authorities held an Intergovernmental Symposium in Rüschlikon, Switzerland, on "Transparency and Coherence in Language Learning in Europe: Objectives, Evaluation, Certification." A conclusion was that a Common European Framework for languages was needed to improve the recognition of language qualifications and co-operation of teachers, eventually leading to improved communication in Europe. A project was set up to develop levels of proficiency, and to lead on to the creation of a "European Language Portfolio" – a certification in language ability which can be used across Europe (Council of Europe, 2001). The Common European Framework classifies learners into three larger divisions which can be divided into six levels:

- A: Basic User
  - A1: Breakthrough
  - A2: Waystage
- B: Independent User
  - B1: Threshold
  - B2: Vantage
- C: Proficient User
  - C1: Effective Operational Proficiency
  - C2: Mastery

The CEFR levels of achievement describe what a learner is supposed to be able to do in reading, listening, speaking, writing and interaction at each level. These descriptions were based on experience and cannot claim to be the faithful results of thorough research into interlingual development, such research which led to useful results (cf. Ellis 1994) should be encouraged in order to breach the gap between theory and institutional practice.

Our position here is that curricula and syllabi are guidelines, as are descriptions of levels and attainments, and with van Lier (1996) and other authors (Beacco, 2000), we will endeavor to show that a curriculum can be seen as interaction with the real world, based on descriptions extracted from the realities of life and communicative situations, and not as an isolated end in itself. As a consequence, the curricula can also be experienced as interaction, and learners can, when the context makes allows, become their own course designers (White, 2003, pp. 156-7). As a way of increasing learner involvement, the content does not have to be pre-defined but can be selected and negotiated through the course as language learning and language use are intimately linked. Of course, attention must be paid to the demands of the curriculum. The shift is reflected in the design of the materials, the roles envisaged for teachers and learners, and the formation of learning networks. Leaving materials open encourage and show learners how to access and use resources in their context, to carry their learning into the community and to develop strategies for taking greater responsibility for their learning (White, 2003), but mediation must play its part in order to ensure that nativization processes do not lead to inadequate assimilation as we will see in subsequent chapters.

Content and Language Integrated Learning/Bilingual Education in Curricular Development

As seen above, the stress on content, which is of paramount importance, can be found in immersion programs and bilingual education in North America. In Europe, CLIL programs refer to

educational settings where a language other than the student's mother tongue is used as the medium of instruction, these programs are also referred to as Content-Based-Instruction, Bilingual Teaching and Dual Language Programs (Dalfon-Puffer, 2007). CLIL courses are different from traditional L2, or language for specific purposes courses (LSP) in that language form/forms are not the focus of the use of target language. The curriculum which CLIL courses refer to is designed by the specialists of the discipline taught, such courses cannot prepare learners for other situational contexts in any direct way.

CLIL classrooms provide a familiarity for dealing with particular situations. Participation with (non-) native speakers helps develop topic knowledge and participation in educational discourse increases learner capacity to understand the linguistic code, but parallel to the disciplinary curriculum, interactions in the course should help to implement an L2 curriculum specific to each learner.

Since familiarity with content facilitates L2 acquisition, the content element should certainly be taken into account in distance courses and can lead to more fruitful interactions among distance learners with different contextual backgrounds but similar professional or other interests.

Types of Language

As early as 1981, Porcher explicitly referred to non specific materials and regretted the consequent necessity to artificially create ideal learners. This absence of specificity becomes largely irrelevant in the case of ESP for various reasons. It becomes possible to account more easily for the target language by observing objective / real-life situations, since the language community is more easily definable. And although heterogeneous in terms of linguistic competence and schematic knowledge, ESP learners have similar goals which make them identifiable. The absence of personalization deplored by Porcher is compensated in the case of ESP by the necessity to acquire new roles (social, professional) for which language takes on a utilitarian function and is no longer perceived as the sole / main object of learning. ESP courses go some of the way towards presenting social situations and real-world activities and they can go further if use of the specific variant is justified by valid social interaction among participants.

The objective of the language learning and teaching researcher today is no longer to offer linguistic models but to suggest authentic situations requiring actual use of the language to be learnt, so that interaction triggers learning processes and reveals individual learning needs.

Because of the influence of contextual variables it is easier to define what a specific variant of L2 is than to define 'general L2'. The approach we advocate will thus sensitize learners to variations and input must then conform to actual L2 usage (including specific variants like webspeak (see Chapelle, 2003), or the language of texting), if learners are likely to participate in such encounters.

CONCLUSION

Social situations, real-world activities, curriculum as interaction, CLIL-type courses and sensitization to variations are the key words in the implications of our study of the language pole. The emphasis seems to be on interaction and realism. It has been difficult to avoid discussing language learning in this chapter, but chapter 4 will focus on learning instead of focusing on what language is and how it is processed in general. We will see that taking learning into account stresses the role of interaction while uncovering the need for personal reflection and work.

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Chapter 4
L2 Learning Processes

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OBJECTIVES OF THE CHAPTER

This chapter will deal with one of the processes which connects the poles of our model: learning, and in our case, learning L2 in distance settings. In this study of the different theories that contribute to our understanding of the domain, the specific points that seem of interest in the context of distance second language learning will be highlighted in order for us to be able to integrate these points into a coherent organization. According to Jordan (2004), there are over 60 theories describing Second Language Acquisition (SLA). These theories deal with the same phenomena that can be viewed as the crystals of a kaleidoscope. Each tilt of the kaleidoscope will lead to a different interpretation of how these phenomena can be organized or explained (Narcy, 1990). Some of these theories are ambitious and try and provide global answers, while others limit the scope of their study, but are not necessarily less interesting. Finally a whole body of results may come from less researched everyday classroom practices. This is how the chapter will be organized in the light of the specific demands of distance language learning. Our debt to the various researchers we quote is obvious and we hope we have not misquoted them. With Lamy and Hampel (2007), we agree that all theories can inform our position to distance-learning. Learning L2 is but one aspect of learning, and before going into how learning L2 is described, more general epistemological considerations need to be expressed. They will serve as guidelines to select the relevant crystals.

The major objective of the chapter is to determine the nature of the crystals in order to organize them into a coherent whole that can be applied to

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the development of distance language learning environments. One way of reading the chapter may consist in making a list of the determining crystals and organizing them. A comparison with the classification and organization proposed at the end of the chapter may prove a worthwhile starting point for a debate among readers.

LEARNING THEORIES AND THE NEED FOR DISTANCIATION

Distanciation

The role that neurophysiology now gives to emotions changes the way we look at the rationality of human reflection as Damasio clearly shows in the title of one of his books: Descartes' Error (1994). Researchers in neurophysiology, for instance Damasio himself (1999), LeDoux (2003) or Buser (1999), and in post-Bourdieu French sociology as well (Kaufmann, 2001, or Lahire, 2001), tell us that a given social situation will cause an individual to respond according to an emotion which is personally specific to this type of situation and to what he or she is meant to do in the situation, combined with his or her other more immediate emotions, and this interplay of emotions is likely to trigger his or her cognitive response to the situation. Lahire (2001) and Channouf (2004) among others, remind us that individuals access their attitudes, emotions and other inner states only partly by inferences drawn from observing their behaviors or circumstances. Inner clues are weak, ambiguous or cannot be deciphered. Everybody observes who they are and what they feel and must rely on external clues to be able to infer their inner states. Some form of mediation will prove beneficial as the only way to compensate for the impossibility of fully effective introspection. This combines with the notion of cognitive unconscious (Channouf, 2004, Buser, 1999) which monitors the way humans perform sometimes very complex actions without their being conscious of what determines that performance. It can be postulated that humans go through their life and education without necessarily being fully aware of their need for distanciation and for mediation.

Research now relies on physically observable neurophysiological data thanks to new instruments. Maintaining personal behaviors and teaching practices that do not take these facts into account is less defendable. Human conditioning is not necessarily immovable and humans would gain from an authentic reflection (distanciation) which would help them become "less assertive" (Laborit, 1996).

Gagné's Hierarchy of Learning

Gagné's classification (1985) helps us understand some of the problems encountered by learners which may increase their initial destabilization. Individuals cannot access the most complex ways of learning until they have accessed the lower ones:

- problem solving,
- rules,
- concepts,
- discriminations,
- verbal associations,
- chaining,
- instrumental conditioning / associative learning,
- classical conditioning.

This should be remembered in organizing sequences of tasks/activities in order to lead learners gradually from what is easiest for them to what is difficult, remembering that L2 may turn things which are found to be easy in L1 into disturbingly difficult things to do in L2.

Access to Distributed Knowledge and the Pedagogic Relationship

When learners want to access data available on a given electronic site, they require technical knowhow. Analyzing and reconstructing these data into coherent knowledge or knowhow will require knowing how to learn and knowing how to be (known as *savoir-être* in French). Teachers find themselves in a very similar predicament when they try to fulfil their role. There is no denying that they are still, singly or in a team, in charge of organizing the learning environment and of implementing the course (which requires skills in engineering, didactics and pedagogy). They cannot, however, stand between the learner and the data. They stand next to the learners and are expected to discuss the learning process and outcomes with them. The computer, which does not have to be connected to a network, is a transmitter of data and the teachers actually play the part of a mediator. They support the learners in the transformation of data into knowledge by themselves and for themselves. Before the development of ICT, the distinction between data transmission and cognitive mediation in the construction of knowledge was not so clear, since a teacher performed both roles at the same time. Belief in the cognitive transmission of knowledge was possible, but it merely reflected a misconstruction of the phenomena. The role of the teacher is far from being devalued but traditional beliefs and representations are modified. This is true for classroom teaching, it is even more obvious in the case of distance learning, but may cause resistance in many educational contexts.

As Lamy and Hampel (2007, p. 44) remind their readers by quoting Warschauer (1999, p. 11) the decentered, multimedia character of new electronic media facilitates reading and writing processes that are more democratic, learner-centred, holistic and natural. This more democratic approach may leave the learner without immediate mediation. Furthermore assimilation or nativization (see below) may cause a construction of knowledge that does not reflect the data that were issued in a context the learner is not familiar with. This justifies our position that humans should be sensitized to their epistemological responsibility (Kelly, 1955) as seen in previous chapters.

A KALEIDOSCOPIC VIEW OF THEORIES OF SECOND LANGUAGE LEARNING: SOPHISTICATED ALL-ENCOMPASSING THEORIES

Behaviorism

This theory does not need much space in this book as it has been studied at length and is largely refuted. What matters now is that some of its tenets correspond to commonly held beliefs. It can be misleadingly attractive in the form of programmed learning (see Chapelle, 2001, p. 22), especially as far as distance learning is concerned. We will see that automaticity and practice are postulated to be beneficial but not in the way they are dealt with in behaviorist approaches. In phonological terms, however, this type of practice may prove effective (Randall: 2007). Producing language is more complex than sheer stimulus-response associations and the link between form(s) and meaning depends on the context and cannot be accessed in the direct obvious way of audio lingual courses.

Nativism

Chosmky's most famous theoretical postulate (1972), the Language Acquisition Device (LAD) is not pertinent in our case in view of the specific context of language learning. However Universal Grammar (UG), more specifically the concepts of parameters and markedness (Randall 2007: 43), may have a certain validity to help anticipate some of the paths learners are likely to follow.

As a mechanism for second language acquisition, noticing has long been discussed and the way

in which it happens consciously (explicit learning) or unconsciously (implicit learning) has been debated, in particular in relation to whether the ability to notice strange features in non-native languages is an innate ability which rapidly declines with age. Exposures to highly marked situations will still be noticed, but the noticing of such marked features may also be explained in general cognitive terms of directed attention to highly unusual features rather than innate processes of language learning (Randall 2007, p. 43). Whether this is an innate capacity or a general one is less important for us than being aware that this implies knowing which languages the learner already knows and their potential influence.

The best known L2 application of nativism is Krashen's monitor model (1982) which is not necessary to go into at length here. However, the relationship with nativism is more complex than might be imagined at first. Randall (2007, pp. 150-152) sees some contradictions in Krashen's model. In terms of cognitive load in Working Memory (WM), Randall thinks that aspects of Krashen's theory of second language acquisition are supported by models of language processing, particularly the restricted capacity of WM (Randall, 2007, p. 153). Krashen does not use the information processing model to support his ideas and he relies on motivational arguments which relate his hypotheses to Communicative Language Teaching (CLT) in its nativist paradigm.

Cognitivism: Cognitive Developmental Perspective

In this theoretical approach, "learning L2 is seen as the result of cognitive-code learning, both oral and written, in order to memorize grammatical patterns and lexis leading to the assembly of language" (Randall, 2007, p. 149). The advent and extraordinary development of computer science explains why Ellis (2001, p. 194) writes: "the study of the cognitive processes involved in learning and using a language was influenced by computational models of language learning which treat acquisition as the product of processing input and output". Cognitivism deals with intrapersonal processes that cannot be overlooked as will be developed later. Information processing is the most productive branch of cognitivism as far as second language learning is concerned.

Information Processing

In the information processing model, human learning, SLA in our case, is viewed as the gradual construction of knowledge or skills and the ensuing practice that will lead to automatic recall for processing L2. Anderson's work (1995) has been extremely influential, it describes SLA as skill learning (Lightbown and Spada, 2006, pp. 39-40). A distinction is established between declarative memory (what is known) and procedural memory (how it is processed) (Randall, 2007: 132/3). Declarative knowledge is available for use once the rule has been explained. The attention mechanism can thus notice the salient features of the structured L2 input provided during the input and practice phases. The production of L2 output is directed through the declarative rules contained in the presentation phase. Through practice, the learned or declarative knowledge can gradually become more automatic and begin to be incorporated into the procedural, or "unconscious", knowledge which will be retrieved automatically. Declarative knowledge is postulated to undergo or to require a process of restructuration, when the change cannot be attributed to, or expected from, a gradual build-up (Lightbown, 1985, or McLaughlin, 1990).

Processing needs to be transferred appropriately: in particular, data are best retrieved in situations similar to those in which they were encountered (Blaxton, 1989). This may explain some retrieval difficulties in real-world activities when L2 data have been introduced in traditional classroom settings. This is one justification of the need for an interplay of cognitive work and

interactive work we will highlight in this chapter. This theory seems to handle only part of the processing of L2 reception and production and we will see that it has been complemented by further research developments.

Connectionist Models of Language

This explanation of language processing connects language performance with neurological mechanisms (Randall, 2007, p. 21). The frequency with which the learners encounter specific linguistic features in the input and the frequency with which features occur together are given paramount importance. Learners gradually build up their knowledge of L2 through exposure to the thousands of instances of the L2 features they hear or see. They develop a network of neural connections between situations and linguistic elements until the presence of one situation or one element will activate the other(s) in their mind. As suggested by N. Ellis (2005) and others, language is at least partly learned in chunks rather than single words.

According to Randall (2007, p. 21), "Language processing can be described at two levels: at the psychological level, in terms of symbol processing; and at the implementation level, in neuroscientific terms" (from Chater and Christiansen, 1999, p. 226). At times the symbolic level may be more applicable (for example in designing a language program), at others the connectionist model may have more potential (for example in designing the types of activity). A language program, however, may be designed by relying on data more directly accessible to the learners than symbols (social situations of use of L2, see chapter 3), since the descriptions of the symbols result from higher-order cognitive work (see Gagné, 1985) and may not be directly accessible to the learners. Symbolist approaches tend to be linear (see below). Since real life is complex and fluid, linearity may not be the most successful approach to course design.

Parallel Processing

Many models see language processing as a serial process (see Levelt, 1989). This has been challenged by models that are based on how the brain works by carrying out a huge number of operations at the same time.

Parallel distributed processing rests on the strength of the connections between different language features (such as words) and present a very different picture of language processing than is assumed by symbolist approaches.... (Randall, 2007, p. 19)

As has been mentioned, symbolist approaches lead to linguistic descriptions. Linearity in language learning may therefore be misleading and learners might gain by following more complex paths that are more likely to trigger the right series of responses.

The Competition Model

According to Lightbown and Spada (2006, p. 42), this model is closely connected to the connectionist perspective. It postulates that language acquisition does not depend on any innate brain module specific to language.

Each language gives 'cues' which signal specific functions. Languages use multiple cues, the importance of which varies with each language (Lightbown and Spada, 2006, p. 42). In English, word order will be a safe indicator of the relationship between sentence components. Italian and Spanish rely more on morphological markers and French on pragmatic markers, etc.

Learners must be sensitized to the relative importance of the different cues appropriate in the language they are learning and the competition model can help anticipate some Working Memory (WM) difficulties and some intercultural difficulties as well.

Givon's Discourse Hypothesis

According to Givon (1979), the varieties of language which are found in the discourse types they have encountered are the only ones L2 learners will acquire easily. Consequently, it will be worthwhile to enquire into which types of discourse learners usually engage in whether it be in L1 or in other languages. This hypothesis strengthens the case for relying on situational data to organize a course and will have to be validated in as many contexts as possible.

The Constructivist Perspective: Piaget

Piaget (1926) hypothesized that children learn by doing and are born with and acquire schemata, or concepts, in order to act and respond to the world. The more children do, the more knowledge they gain, and they build up a sense of identity as they acquire their L1. Piaget describes different phases of general cognitive development, with processes and patterns that constantly update and re-organise schemata and thus change systematically with age. Language acquisition is assumed to be part of this complex cognitive development. L1 acquisition may be innate, but this does not imply that the brain has a specific language acquisition device (LAD). External and social influences trigger off language acquisition: symbolic and functional schemata (thought or behavioral patterns) are drawn from these data. Interactionist theories derived from Piaget's ideas support his theory. Some studies (e.g. Newport, 1990) show that SLA ability does not decline quickly after puberty, but slowly with age along with other cognitive abilities, which supports Piaget's theory.

Two concepts described by Piaget have great explanatory power in our construction of what second language learning implies: assimilation and accommodation. These two complementary processes of adaptation enable humans to internalize awareness of the outside world. Although one may predominate at any given time, they co-exist in a dialectical relationship. In assimilation, what is perceived is incorporated into the internal world without changing its structure, but with the risk of adapting the external perceptions to fit, leading to hasty classifications. In accommodation, the internal world has to adapt to the external evidence, which can prove difficult and painful. In reality, both processes are going on at the same time, so that humans are assimilating information in the world around them while their minds also have to adjust to accommodate it.

Nativization (Andersen, 1983) corresponds to assimilation. Nativization (or assimilation) creates the need for mediation, and therefore for careful thought to be given to support and monitoring in the case of distance learning.

Piaget was not concerned with older learners for whom accommodation and assimilation is more problematic than for children, older learners have relatively successful ways of understanding their world. They will not experience much difficulty in assimilating new information which fits with their representations and beliefs, but they will find it increasingly difficult to face new facts.

Socio-Constructivism

In Bandura's theory (1986) people acquire behaviors through observation, and later imitate what they have observed. Observational learning, or modeling, includes several steps:

- An individual must pay attention to the features of the modeled behavior in order to learn something.
- In order to be influenced by observing behaviors, an individual needs to remember the activities that were modeled at one time or another (retention). Observed behaviors are stored in the form of mental images or verbal descriptions that can be recalled when the activity must be carried out. This partly confirms our hypothesis that social

situations should be the organizing elements of L2 curricula, see chapter 3.
- Symbolic representations will have to be turned into appropriate actions (reproduction). Individuals try to act in accordance with the modeled pattern(s). Reproduction improves with practice (this seems appropriate in the case of L2 learning especially in cultural terms).
- Reproduction requires some motivating factors. Incentives reinforce motivation but negative feelings discourage the continuation of the modeled activity: this should be remembered when giving feedback.

Self-regulation monitors the interaction between the environment and a person's psychological states (personality). This self-regulation is a three-step process:

- Humans monitor their actions by looking at themselves and their behavior (self-observation), which has limitations, see Channouf (2004) in this chapter.
- The results (judgments) of self-observation are confronted with standards that are set by society, or by individuals themselves.
- A rewarding or a punishing self-response will follow the judgment.

Bandura's theory contains elements that guide our actions. It is not directly a study of language acquisition or learning and it will have to be complemented by further theories.

The Sociocultural Perspective

This theory comes from the rediscovery of Vygotsky (1978) and Leontiev (1981). This approach is interdisciplinary and socially informed and rejects

a narrowly framed SLA whereby an overly technical model of interactions predominate … in favour of a broader frame that integrates this narrow approach into a broader socioculturally driven model which can account for some of the less easily defined characteristics of communication. (Block 2003:4)

Lamy and Hampel (2007, p.23) state that interaction is defined in social terms, whereas in the cognitive paradigm it is seen as "the means by which input is made available to the black box or as an opportunity for producing output" (Ellis 2003, p.175). Interaction with others, especially with peers and teachers, is necessary for children's learning under adult supervision or in collaboration with more capable peers before they learn to solve problems independently (Vygostsky 1978, p. 86). Rees (2003) contains interesting applications in L2 learning in self-directed learning situations. Higher forms of learning are thus mediated, but development can only take place if mediation occurs within the Zone of Proximal Development (ZPD): what the learner is ready to cope with.

Psycholinguistic descriptions of learning overlook a number of contributing factors (learner characteristics, role of the teacher, and the setting or approach to activities as well as institutional and cultural factors). These can be found in sociocultural theory, for instance, Lantolf (2000) describes (1) social mediation: mediation by others in social interaction, e.g. mediation through experts and/or peers, (2) self mediation: mediation by the self through private speech and (3) artefact mediation: by language, but also by portfolios, tasks and technology.

Situated social practice plays a role if learning is viewed as situated in *social practice in the lived-in world* (Lave 1991, p. 67, in Lamy & Hampel, 2007, p 26), which leads to the ecological approach which sees learning as:

A non-linear, relational human activity, co-constructed between humans and their environment, contingent upon their position in space and history, and a site of struggle for the control of social

power and cultural memory. (Kramsch, 2002, p. 5, in Lamy and Hampel, 2007, p. 26)

Language is conceived as an embodied and situated activity (Van Lier 2002, p. 146), and this has led to the concept of communities of practice (Lamy and Hampel, 2007, p. 27) which is very influential in the literature of distance second language learning when conceptualizing learning within online groups (Lamy and Hampel, 2007, pp. 27-28).

In spite of the reference to Vygosky (1978), who also insists on the importance of intrapersonal development, the socio-cultural approach highlights the interpersonal part of the learning activity and may need to be complemented by further theories.

The Interactional Perspective

From a cognitive perspective, distance learning should provide language input and analytic and inferential tasks. From a sociocultural perspective, it is expected to provide contexts for social interaction, to facilitate access to existing discourse communities and create new ones. It is now clear that our problem in this book concerns the integration of apparently conflicting theories. This integration will be facilitated by recourse to ICT, since CALL programs and later CMCL applications can provide language learners with comprehensible input, but also with a platform for interaction where they can work with texts (CALL) or negotiate meaning with peers and tutors (CMCL). Computers also have given learners the opportunity to produce comprehensible output (Lamy & Hampel, 2007: 22).

With the interactionalist theory, we are now back to what Block calls "*a technical model of interactions*" (Block, 2003, p. 4, quoted above). Interaction has been analyzed in social terms, see chapter 8 or above (sociocultural perspective). We are now at the intersection of the cognitive and the social.

Long (1983) confirmed the role of comprehensible input, but postulated that modified interaction was the necessary mechanism for making language comprehensible. Modified interaction involves both linguistic simplification and elaboration: slower speech rate, gesture, or additional contextual clues (comprehension checks, clarification requests, self repetition or paraphrase).

In his revision of the hypothesis, Long (1996) underlines the role of corrective feedback during interaction, which corroborates Swain's (1985) comprehensible output hypothesis, and the francophone potentially acquisitional sequences which are described in very similar terms (Lüdi and Py, 2003).

Long refers to the concept of 'noticing' (Schmidt, 1990) and hypothesizes that post-modified input (recast seen as a reformulation of the learner's preceeding inadequate utterance) is more effective than pre-modified input (models of the correct forms taught to the learner beforehand). Post-modified input enables learners to 'notice the gap' (Swain, 1998) and to reorganize their interlanguage accordingly. Learners are not always in the position to 'notice the gap' and the consequences of nativization processes may have to be analyzed. Learners obtain more adapted input through interaction with other speakers of L2 by obtaining conversational adjustments (models, expansions, reformulations) from their interlocutors, which does not mean they will be in a position to process, analyze and memorize what has been adjusted.

Communicative Language Teaching (CLT)

This approach is so well-known that it is no longer necessary to describe it. It emphasizes meaning, not form, and reflects an interest in the social functions of language and not in grammar. It is a symbolic approach which relies on sociolinguistics and notional/functional syllabuses (Wilkins, 1976). In terms of learning, its protagonists

have not been very descriptive and favor either nativist assumptions or cognitive hypotheses. Post-communicative trends have already been mentioned (chapter 3), the action-based approach compensates for the lack of common goals in what the learners have to perform (Council of Europe, 2001) and Task-Based Language Teaching will be shown to compensate partly for the lack of learning theory in early CLT.

A KALEIDOSCOPIC VIEW OF THEORIES OF SECOND LANGUAGE LEARNING: THEORIES THAT DO NOT COVER EVERY ASPECT OF SECOND LANGUAGE LEARNING

Nativization/Assimilation vs. Denativization/Accommodation

Nativization (Schumann, 1986, Andersen, 1983) has already been mentioned in relation to Piaget. It is not invalidated by neurophysiological research (LeDoux, 2003). Psycholinguistic or neurolinguistic evidence also confirms its role, without necessarily using this term or the term assimilation to describe the phenomena. We saw when dealing with nativism (this chapter) that noticing strange features in non-native languages is an ability which rapidly declines with age, but exposures to highly marked situations will still be noticed (Randall, 2007, p. 43). When the features are different, there is a need for: (1) recalibration of the feature detection system for L2: that system will need to become highly automatic, (2) until automaticity is reached in L2, learners will need to be more consciously aware of such features, which will result in problems of locus of attention for interpreting the message. As a consequence, they will need to spend more processing capacity on formal bottom-up features than on contextual top-down features (Randall, 2007, p. 51). In the previous sentence, (1) corresponds to what nativization requires and (2) to what denativization is about.

As far as phonology is concerned, Dupoux (2001), among others, describes the problems encountered by learners in ways which correspond to the descriptions of nativization. Though these phenomena have long been known (Troubetskoy, 1939), they are still often overlooked which may be detrimental to adequate uptake of the input.

Perception and Attention

The link between socio-cognition and the interdependence of attention and interpretation is a phenomenon that should be kept in mind (Robinson, 2001). It means, among other things, that attentional mechanisms and discourse frames can be viewed as complementary and interrelated, and this cannot be ignored in task design.

Schmidt's definition of attention is access to awareness (in Robinson 2001, p. 3). Because individuals do not pay attention to the same phenomena even in highly focused learning activities, they become aware of different things. Attention is limited and selective. The cost-benefit ratio varies with individuals and determines what will be focused on. Nativization prevents learners from knowing what to pay attention to when learning L2, since they cannot anticipate what is to be noticed. Attention is a cognitively costly phenomenon and this should be taken into account in terms of learner and teacher expectations. Expecting some results too quickly may be counterproductive just as not giving feedback on some points at an early stage may be detrimental. It is not easy to determine the best time to give feedback in terms of the attention it may demand. Input processing as a function of the context is an attentional phenomenon, even if some of the associations result from no specifically focused noticing (thus resulting apparently from implicit processing). Input processing relies on data such as perceptual saliency, frequency and continuity of the elements and other parameters.

The effects of nativization will be felt and mediation or peer scaffolding will prove useful, since initial processing will rely on internal, personal criteria and not L2 criteria. Explicit instructions help focus attention (well-designed tasks will make it possible to enhance input and focus the learners'attention). Tasks can thus be seen as a form of mediation.

Input can either be detected unconsciously or consciously (registration). Only registration is effective. Registration can be postulated to be nativized if resulting from inadequate analysis of the L2 elements.

Learners will process the input selectively which will result in suppression of what does not seem relevant (some data will not be perceived). This suppression will be nativized and the learners are likely to suppress relevant points. Peers and tutor will play a role in overcoming this phenomenon.

Changes in learner interlanguage occur from the accumulative construction of rules or of instances with a gradual understanding of the interface between these constructions and the input. This implies taking into account the context and the intention of the interlocutors. Nativization will justify mediation not necessarily in the form of traditional classes with abstract metacognitive information and therefore will lead to a change in teaching and learning practices that can be both individualized and collaborative.

Attention is a crucial phenomenon, and no learning can take place adequately without conscious consideration of what will require focused attention. The adequate conditions for attention to be effective have to be determined and validated in each course.

Noticing and Noticing the Gap

Noticing as a result of attention has received serious consideration in SLA (Ellis, 2003 or Robinson, 2002, for instance). The need to understand the link between instructed SLA and developmental sequences and between explicit and implicit knowledge and the need to understand the effects of frequency on cognition and SLA justify the interest in noticing. Noticing may be improved by a structured environment. We will see that structured does not necessarily mean rigid. Contrary to what the earlier proponents of CLT thought, as a reaction against audio-lingual methods, noticing can be enhanced by minimal pair exercises (Randall, 2007, p. 53), and research results indicate that it is facilitated by input enhancement (Ellis 1994, p. 661) and flooding (Robinson 2002, p. 7), which must then be taken into account in task design.

Schmidt (in Robinson, 2001, pp. 3-32) considers that no learning is specifically implicit, even in spontaneous interaction. If something is learnt, it is because something led the individual to notice it. Noticing is connected to an individual's working memory, the higher the WM capacity the more can be noticed (Mackey et al, in Robinson, 2002, p. 205). Successful learning in interactive activities will depend on the capacity of the working memory and on attentional capacity. Contradictory data on the capacity of learners to learn from interaction can thus be obtained from different learning contexts. Mediation (in the form of tutor intervention, of tasks or of learning environment) plays a role in compensating for these contextual and individual variations.

Depth of Processing

There has long been an agreement (see above) that meaning matters more than form(s) which cannot be processed adequately when detached from meaningful contexts. As a consequence, deep processing is a determining parameter. Strictly behaviorist activities can no longer be justified even if they still dominate some courses (on or offline).

Depth of processing may be a misleading concept, communication strategies will make communication easier and meaningful, but they may counter a positive evolution of learner

interlanguage because they may cause an implicit use of data that do not correspond to the learners'objectives (nativization) (see Skehan, in Robinson, 2002, p. 86).

Repetition, or rehearsal, is now rehabilitated (see Hulstijn, in Robinson, 2001), as long as it remains contextualized and follows, and is followed by, meaningful activities. Randall (2007, p. 135) underlines the difference between pure rote learning and more cognitive learning and advocates for the latter. Task design will have to reflect the emphasis on depth of processing.

Relationship Between Explicit and Implicit Knowledge

Implicit knowledge is knowledge which is processed automatically and unconsciously whereas explicit knowledge can be expressed verbally (Gaonac'h, 2006). There is a major theoretical difference between implicit learning and procedural knowledge, the former contains data whereas the latter is described as consisting of processing and retrieval procedures. Repetition and attention have a link with implicit and explicit learning, even if there is as yet no clear determination of the extent to which explicit knowledge, gained through formal instruction, can lead to the development of implicit knowledge which underlies spontaneous and naturalistic L2 use (Ellis, 2003). Randall (2007, p. 145) gives evidence that declarative memory and implicit memory are processed in separate areas of the brain, which may explain why explicit knowledge does not readily become implicit knowledge: connections have to be made in meaningful activities.

As we have seen, CLT is based on the assumption that L2 is acquired as learners take part in meaningful activities in which they will become aware of their language deficits and modify their interlanguage accordingly. Spontaneous 'noticing' in real life places heavy cognitive demands on WM, which has to cope with problems of processing the input and is subjected to the effects of nativization and the pressure of communication. In explicit L2 learning or teaching, explanation and/or presentation of a point, is followed by model sentences to practice, and finally the application of the rule in a relatively freer environment. In many language teaching contexts, this procedure is frequently resorted to. For Skehan (1996), such grammar teaching reduces the cognitive load, because the student's attention is focused on important features of L2. It remains necessary to use the explicit knowledge in meaningful activities in order for it to become implicit. The amount of such practice will depend on each individual learner in their specific context, since memory is an individual characteristic which must be supported by the learning environment.

Memory and Language Learning

Working Memory

Working memory (WM) plays a major role in human cognition: *it is the place where information is analyzed and meaning extracted* (Randall, 2007, p. 17). Baddeley is associated with a working memory model (1986) that has become the dominant view in the field of working memory. Originally, it was composed of three main components; the central executive which acts as a supervisory system and controls the flow of information from and to its slave systems: the phonological loop and the visio-spatial sketchpad. The phonogical loop is a short-term store made up of auditory traces, which are subject to rapid decay, and of an articulatory rehearsal component that can revive the memory traces. The slave systems are short-term storage systems dedicated to a content domain (verbal and visio-spatial, and an episodic buffer). The distinction of two domain-specific slave systems was derived from experiments which showed that the simultaneous performance of two tasks requiring the use of two separate perceptual domains (i.e. a visual and a verbal task) is nearly as efficient as individual performance of the tasks.

Conversely, when a person tries to carry out two simultaneous tasks that use the same perceptual domain, performance is less efficient than individual performance of the tasks. This finding may help us in designing tasks depending on the level of difficulty we want to achieve. Descriptions of WM (Randall, 2007, pp. 15-16) stress its limited capacity which is why the role of sensory stores is to limit the amount of information. This filter will be subjected to nativization and the wrong data may initially be filtered. Some studies have indicated that working memory was partly based on the phonological structure of L1 (Cutler, 2000). In segmenting speech, speakers of different languages apply different heuristic procedures, efficiently exploiting the specific phonological structure of their various languages such as syllables or rhythms. WM will have to be trained to retain oral utterances in the case of languages that are structured differently. This will combine with the variability of the cues in the competition model (see above). A French-speaking learner of English will experience difficulty in segmenting (English is not syllable-based) and will have to store syntactic and not pragmatic cues in WM to process L2. Extensive training may prove useful.

Long-Term Memory

Long-term memory (LTM) sets different problems than WM. The major problem in our case is to know whether LTM has one store or two. There are no clear answers, but an interesting and practical position is found in Randall (2007, p. 120): *… there is a good deal of evidence of a shared conceptual store and shared processes in both languages, but separate formal stores*. The general attentional mechanism oversees the processes. The conceptual store may need reorganizing to accommodate concepts or conceptual organizations foreign to L1 and denativization may be seen as a process of separating what belongs to L2 from the initial L1 formal store that was initially called upon (assimilation).

Task design should rely on these assumptions while assessing their validity in reflective practice (action research).

Developing and Restructuring the Learner's Linguistic Competence

As was seen above, the learner's linguistic competence may not develop adequately by relying solely on implicit knowledge formation, and a lot of thinking has been devoted to this aspect of L2 learning.

Focus on Form and Focus on Forms

In the early days of CLT, language learning was assumed to be a natural acquisition process which emerged from the communicative event. Eventually, attention turned to the processes through which interaction turns into learning (Randall, 2007, p. 157).

According to Long (1991), completed by Ellis (2001), there are three basic teaching options (adapted from Randall, 2007: 157):

- Learning can be based on meaning by providing a rich corpus of appropriate language material, the learners acquiring the language through use of the material in communicative interaction (Focus on Meaning);
- Learning can be based on the formal study of aspects of the language such as grammar (Focus on FormS). The forms are presented to the learners either explicitly (teaching of the rules) or implicitly (inference exercises).
- Learner output will be used to determine the examples of language form which will help students become more effective, this approach will combine meaning and form (Focus on Form: FoF).

Planned FoF involves the treatment of pre-selected forms in activities which focus the learner's

attention on meaning whereas in incidental FoF, attention occurs incidentally without prior pre-selection. Incidental FoF is more flexible and less linear, but important aspects may be overlooked. FoF can be reactive (a problem has arisen in the learning situation), or preemptive (a problem is predictable: frequency and importance).

Ellis (2001) uses the term –Form-Focused Instruction (FFI) to describe the range of approaches in which conscious attention is paid to aspects of form in L2 learning. Focus on form can be realized in language courses through both process and design (Nassaji (1999). FFI refers to a wide range of activities with a number of elements which must be considered, such as the continuum of implicit versus explicit FFI, with formal, rule-based instruction at one end, and embedding of the target structure in authentic discourse at the other. Distance learning will pose different problems which will be discussed later.

Nativization justifies the need to raise awareness of language features for effective learning to take place and this can be done in many different ways which should be validated in the different contexts of use: awareness-raising exercises, recasts of different types and explicit correction with or without the explicit reference to grammatical rules.

The role of the pre-teaching of grammatical forms on intake has been investigated, as well as that of prior practice on task performance (DeKeyser, 1998). The results confirm the validity of such practices, but distance language learning may gain from avoiding the linear, planned approach that these practices sometimes lead to.

Classroom-based research shows that FFI produces positive results. It has long term effects but must be integrated with form-focused activities, particularly those requiring output (R.Ellis, 2001). Ellis et al (2006) found that both implicit and explicit knowledge benefited more from the use of explicit (use of metalinguistic explanation) rather than implicit feedback. Which form this feedback may take in distance language courses, as well as how best it can be carried out, remains to be seen.

Mediation and Meta-Reflection

Mediation implies a metalanguage and access to the descriptions of linguistics and applied linguistics. These descriptions will have to be made accessible to the learners. As has been seen earlier (chapter 3 and this chapter), these descriptions of linguistics and applied linguistics are not necessarily the best foundation for organizing a curriculum or determining course content in learning environments in which content is fluid and learners are partly in charge of designing the course.

Meta-knowledge partly concerns the 'tongue' (*la langue*), descriptions have been systemic (linguistics), or functional (applied linguistics), a choice will have to be made in view of what is more appropriate to the learners' needs.

Researchers have claimed that data are stored in LTM in the form of concepts (Changeux, 1983), and therefore a conceptual description of language would prove useful. A conceptual systemic description of language can be found in enunciative linguistics in Europe (Groussier, 2000) and functional descriptions are better known in the English-speaking world: Halliday (1973) and also the speech act theory (Wilkins, 1976). What such descriptions offer will help learners understand how the language works and anticipate what should be noticed, which will make noticing easier and more effective (see above). Transformation of such explicit knowledge into implicit knowledge will be caused by interaction activities, the success of which cannot be predicted. In view of the complexity of speech production, grammar training can help cope with a limited amount of the required operations only (cf. Ellis 1994: 73-117).

Mediation will consist in adapting the scientific descriptions into acceptable activities bearing in mind that the recourse to explicit knowledge in speech production should be very quick when im-

plicit memory is not efficient. The cognitive load should be as low as possible (Gaonac'h, 1990). Interestingly, research shows that the spontaneous descriptions of peers are sometimes more successful than the scientific descriptions of the teacher (Rees: 2003). However, practical research has shown (Narcy et Biesse 2003, pp. 76-85) that the descriptions of enunciative linguistics (Groussier, 2000) could be transferred into remediation work (similar in approach to Van Patten, see below) with (1) reflective tasks (noticing and noticing the gap, use of key words to describe the concepts), and (2) practice tasks, on the conceptual differences between L1 and L2 in L1 then in L2 (e g. learning to distinguish between what is countable or uncountable in French utterances first, and then practising how to deal with these concepts in « conceptual drills » in which micro-contexts are imposed in order to provoke an adequate response. Mediation for computer applications was attempted, and showed that such work could only be proposed for a limited number of problematic points for fear of learners (high school students in this case) losing interest in them.

Benoit (2004) reinterpreted this work with ICT applications, her results were coherent with the initial results and showed that improvement in spontaneous interaction was felt in quantitative rather than in qualitative terms. This is not as paradoxical as it may seem. Practice makes it possible to become more creative, and becoming creative in L2 means focusing on meaning and not on form. Long-term studies should be carried out to see if the mastery of form improves gradually.

Narcy-Combes (2005) has tried to measure how effective immediate feedback (recasts) in spontaneous interaction was by devising a special « error correction screen ». This screen displayed some twenty concepts which corresponded to the most recurrent errors made by French learners of English (duration, quantity, reference to the past, etc.). The tutor had a keyboard with keys corresponding to these concepts and pressed the keys as required. Observation showed a move of her hand was sufficient to trigger the right recast by the learner (post-articulatory repair), which showed that adequate explicit knowledge was in place.

Pre- and post-tests measured qualitative progress in spontaneous interaction. The results were positive, but the conditions which were required (groups of 4 students in spontaneous interaction based on tasks as well as a willing tutor) did not make it possible to generalize the experiment. Generalization would also have required that all learners be able to accept having their errors pointed out in spontaneous exchanges. This may have been a specific characteristic of the students in the prestigious engineering school in which the experiment had been carried out.

ICT and CMC can make such work even more effective today, but its limitations should be kept in mind (in terms of learner motivation and tutor time).

Input, Output and Uptake

In a study of the difference between 'input' and 'uptake', Van Patten (1996) suggests that the prime purpose for most L2 learners is to process the input for meaning, attending to major content words such as nouns and verbs before attending to structural features. This comprehension-based process is different from process-based approaches where attention is given to the linguistic features of the text. Van Patten's model of the process involved in L2 acquisition involves three separate components: intake (stage I), uptake (stage II) and output (stage III) mediated by a process of accommodation (denativization) in which the learner's knowledge of L2 is restructured based on information from the input. In Van Patten's view the level and quality of the language data offered as input matter enormously. This corresponds to our position as developed in chapter 3 and above. However, as will be seen later, an alternative can be found to avoid too rigid an organization or to avoid collecting input that is socio-culturally too

distant from the learners' backgrounds and interests. This model proposes a methodology that can be adapted to second language learning contexts in order to deal with the effects of nativization and is very similar to what has been described in the previous paragraph.

Output for L2 Acquisition

Krashen's Monitor Model (1981) postulates that input that is comprehensible either because of the context, or because of intentional simplification, is sufficient to ensure acquisition if attitudes are positive (affective filter). This has been contradicted and according to Long's Interaction Hypothesis (1996), learners obtain more accessible input through interaction with other speakers of L2 because of the adjustments they obtain from their interlocutors. As a consequence, input is now thought to be most effective when it is part of an interaction with others rather than with a text (Lamy and Hampel, 2007, p. 21) since interaction allows learners to negotiate meaning and therefore to produce comprehensible output. Ways will have to be found to overcome the absence of face to face interaction between interlocutors in distance learning courses at least some of the time.

Comprehensible Output

As has just been seen, the transfer between comprehension and production is postulated not to occur automatically, and adequate input is a necessary but insufficient and inefficient condition for SLA (Skehan, 1998). Output may play a more important role in the acquisitional process, according to Swain's Comprehensible Output Hypothesis (1985). It has three functions in SLA: (1) it triggers noticing; (2) it develops metalinguistic awareness by negotiating L2 form and (3) it provides opportunities for hypothesis testing.

The Output Hypothesis predicts that production practice, which pushes learners to make use of their intake in an effort to make themselves understood, is necessary for acquisition. This implies accommodating to their interlocutors' expectations, which is likely to reinforce denativization. Conditions for the production of comprehensible ouput should be implemented and results assessed in distance courses by detecting the frequency of exchanges likely to lead to acquisition (see Lüdi and Py, 2003, for similar work in the francophone literature).

Processability/Learnability/ Teachability

Processability Theory (Pienemann, 1981) is based on two other theories: Lexical Functional Grammar and the model of language production proposed by Levelt (1989). It is a very complex theory that will not be described in detail here. Features of syntax and morphology are easier to process when they occur at the beginning or the end of an utterance. There seems to be a sequence of acquisition that is common to all learners but at different rates of acquisition. This rule does not apply to all aspects of L2, there are 'variational' features. Pienemann (2003) also gives interesting insights into transfers from L1 which are not necessarily made at an early stage but only when learners seem to be capable of processing such transfers (perhaps because enough accommodation has been made to see that these transfers are possible).

Taking this theory into account in task design may not be an easy undertaking, but task designers should remember that at least metaphorically, learnability and teachability refer to the potential of the learners and not to institutional or teacher objectives.

Affordances

Affordances ((Lamy and Hampel, p. 34) can be seen as an alternative to the concept of input. The unit of analysis should not be *the perceived object or linguistic input, but the active learning,*

or the activity itself (Van Lier 2000, p. 253). The activity can only be understood if the ecology is understood as well. This includes motives and goals for action. The learners' motives determine how a given situation is construed, and therefore the meaning and function that is attributed to an element of language will depend on how the learner construes it. Thus people with different motives will perform the same task in different ways (Ellis 2003, p. 183) in Lamy and Hampel (2007, p. 35). This corresponds to findings (Combes-Joncheray, 1999) that showed that the input as processed by the learners did not correspond to what was expected by the teachers and the institution because their motives were wide apart and because the learners were satisfied with Basic Intercommunication Skills (BICS, see Cummins, 1991), whereas teachers would expect them to rely on their Cognitive Academic Language Proficiency (CALP). Feedback should take this into account and changes can only result from negotiation that reveals the learners' real motives and confronts them with the course objectives.

Phonological Problems and Acceptability

Pronunciation received a lot of attention in the audiolingual era. It has since been slightly overlooked. Studies show the extent of nativization, and minimal pair exercises are still seen as able to play a part in helping with discrimination (Randall, 2007, p. 142). After a certain age, most learners will need some form of mediation to be able to understand aural input, and, depending on their objectives, to produce oral output that corresponds to their objectives. This can be time-consuming and it will be difficult to set priorities. Distance settings may not facilitate this aspect of L2 learning. Research results have shown that written exchanges in CMC collaborative tasks increased phonological nativization phenomena (Grosbois, 2006). Consequently learners need to be sensitized to this phenomenon and compensatory tasks need to be designed to offset that problem.

Formulaic Language

The study of the effects of formulaic language on L2 acquisition leads to conclusions that more or less correspond to the theory of a dual system of language production described in chapter 3. Wray (1992) proposes a dual-systems solution. Analytic processing implies the combination of words and morphemes with grammatical rules, to create and decode linguistic material. Holistic processing relies on prefabricated strings stored in memory. Individuals will select their strategy according to the demands of formulaic sequences and to processing pressures. A given communicative situation may be too demanding and exceed the resources available. The holistic system reduces processing effort. It is more efficient and effective to retrieve a prefabricated string than to create a novel one (this corresponds to Logan, 1988). Adult speakers may rely more on the holistic system, whereas children may not necessarily do so (Wray, 2007), Formulae can be detected thanks to features such as overall fluency, intonation pattern and changes in speed of articulation (Wray, 2007), and "pauses within lexicalized phrases are less acceptable than pauses within free expressions, and after a hesitation the speaker is more likely to restart from the beginning of the expression". Corpora (oral or written) can help learners acquire these formulae which can be seen as a way of overcoming the initial difficulties of rule-based production and of increasing the rate of acquisition and will be seen as a motivating factor by enabling learners to produce more complex language quickly.

Mitchell and Martin (1997), in Randall (2007, p. 170) noted that early learning of L2 (French in British secondary schools) consisted of the rote memorisation of unanalysed chunks of language and that children,

who did not internalize and retain a corpus of phrases of this kind, at this early stage, were highly unlikely to make any real progress subsequently, and in particular were never seen to move on from pragmatic communication strategies to grammatical control. (Mitchell and Martin, 1997, p. 23)

This counter-intuitive result provides food for thought as to the use of these formulae which obviously require a specific aptitude in order to be memorized (see chapter 6).

This paragraph concludes our overview of theories of L2 learning or teaching, but some practices have been theoretized and can afford worthwhile conclusions.

A KALEIDOSCOPIC VIEW OF THEORIES OF SECOND-LANGUAGE LEARNING: CLASSROOM APPROACHES AND THEORY

Grammar Teaching

Contact with the language in many learning situations is through conscious study. Randall (2007, pp. 162-165) refers to DeKeyser (1998) who points out that implicit (unconscious) learning and explicit (conscious) learning are neither necessarily distinct, nor indeed, as Krashen (1981) suggested, in opposition, but are in fact related. There is evidence to show that the explicit teaching of grammar can be successful (DeKeyser, 2007). The teaching of grammatical rules that goes with traditional teaching practices can be effective in directing the attention of learners to salient factors in L2. Grammar rules can prove useful to the learner in terms of understanding or generating new utterances, they work well for fairly simple structures and many studies have looked at the learning of simple morphosyntactic rules. Approaches to grammar which involve the noticing rather than the naming of patterns, are likely to be more successful (Randall, 2007, p. 165). The fact that grammar or reflection is useful does not imply that grammar teaching should be seen as an *a priori* activity as will be shown later. Because traditional grammar teaching is so developed, and because it can prove of use, resistance may be felt when practices are changed, and it will be seen that it is sometimes easier to provide individual grammar work when learners feel they need it rather than to try and convince them that they will do as well without it.

This would then suggest that traditional grammar instruction works well on the use of prototypicallanguage items (and may work best through their use as examples), and, if the cognitive and memory load is increased by the learning of grammatical terminology with little concomitant payoff in terms of processing speed, then other forms of learning, (i.e. exemplars and simple surface analogy) may well be more profitable.

Translation

For many years, translation has generally been frowned upon as a method for second language learning in the less traditional settings. As a method for comprehending and producing L2 the inefficiency of word-for-word translation has rightly been underlined for two major reasons: (1) the difficulties involved in effective semantic mapping from L1 to L2, and, (2) the extremely slow processing speeds that result from having to 'look up' the L2 word in the L1 and vice versa (Randall, 2007, pp. 165-167).

However, reference to L1 is clearly one of the dominant methods used by L2 learners and it cannot be disregarded. Translation into LI can even be seen as an efficient means of saving working memory space. In a study of SL learners of French in the US using think aloud protocols on a reading comprehension task, Kem (1994, in Randall, 2007, p. 166) found that:

(1) there was little difference between more proficient and less proficient learners in the degree

to which they used translation; (2) the difference between the two groups appeared to lie in the 'size' of the chunks they translated; less proficient readers translated word-for-word, but more proficient readers processed larger chunks of text and then translated them into English; (3) the students, especially the more proficient, reported that translation allowed them 'space' to take in longer stretches of text.

Language is processed for meaning, not form (Narcy, 1990), so the meaning of these larger chunks, once translated into L1, can then be stored so that the learner can proceed more easily. The LI lexicon acts as a mediator between the L2 lexicon and the semantic store (Randall, 2007, p. 167) and translation can facilitate the mediation. Attention should be paid to how effective translation is, in order to verify that it does not eventually become too heavy a technique.

Repetition, Memorisation and 'Rote Learning'

The use of and belief in repetition as a means of learning, shows a great difference between cultures (Randall, 2007, p. 167). Drilling was developed to a large extent in the audio lingual method. It is still the rule in many classrooms, and corresponds to successful learning patterns derived from associative learning theory. Rote learning and rehearsal also seem to facilitate production. CLT and TBLT do not overtly rely on such techniques. Their assumption is that completion of the task will ensure automatization and skill learning. Randall (2007, p. 168) wonders whether a great deal of rehearsal can be generated by drill and silent rehearsal associated with formal study procedures (micro tasks) and be more efficient than complex tasks. He also reminds his reader that in the communicative classroom, the successful student is one who uses a whole range of learning strategies. This corresponds to Hulstijn's position regarding the acquisition of words (in Robinson, 2002, pp. 280-281). Hulstijn stresses the role of meaningful activities before or after the rote learning and his position is clearly a reflection of the trend that combines interactive and cognitive practices.

As far as oral production in meaningful activities is concerned, Randall (2007, p. 168) underlines the fact that rehearsal can be beneficial. Our practice (Narcy-Combes and Narcy-Combes, 2007) shows that tools are now available to make rehearsal more effective (oral and written corpora, copy and paste techniques, *text-to-speech* software, etc.).

The difference between effective and less effective use of repetition would appear to lie in the depth of processing and the type of cognitive processes employed and not in the technique itself.

SYNTHESIS: THE CRYSTALS THAT HAVE BEEN RETAINED

Going over the content of this chapter was a way to make a list of the crystals that we thought were worth collecting in order to construct our own view of theory related to second language distance learning. In Table 1, the determining crystals have been reorganized independently from their theoretical source.

The number of crystals that have been retained should not be felt as a deterrent, no learning environment will be able to control them all to total satisfaction, but the checklist that pilots go through before flying are even longer, and complex systems require teams to organize them. Team work will help redistribute the workload while making sure that all the items are taken on board.

Culture

Culture has been seen to be indissociable from language and content (chapter 3), which does not mean it is going to be easy to treat them together

Table 1. Synthesis of chapter 4

General nature of learning	(1) Any form of complex learning requires distanciation and reflection which will be facilitated by mediation. (2) Individuals cannot access the most complex ways of learning until they have accessed the lower ones. (3) The construction of knowledge is an individual, situated phenomenon as well as a social one. (4) The concept of communities of practice originates in the concept of situated learning. (5) Social mediation can be seen as mediation by others in social interaction, e.g. mediation through experts and/or peers. (6) Self mediation is mediation by the self through private speech and introspection. (7) People acquire behaviors through the observation of others. (8) To imitate a behavior, the person must have some motivating factor. (9) Negative reinforcement discourages the continuation of the modeled activity.
Nature of language	(10) The faculty of language, speech or discourse, and linguistic or socio-linguistic descriptions are indissociable elements of one whole, but one cannot be mistaken for the other. (11) Language is an embodied and situated activity.
Language processing	(12) Some form of meaningful practice will ensure automaticity of processing in real-world interaction. (13) Realistic practice settings will help retrieve the information and skills in similar situations. (14) Knowledge of language may result from exposure to instances rather than to single words, this corresponds to research on formulaicity. (15) Connections between situations and linguistic features should be developed until the presence of one situational or linguistic element will activate the other(s). (16) Language processing can be described at two levels: at the psychological level, in terms of symbol processing; and at the implementation level, in neuroscientific terms. The symbolic level may be more applicable in combining with social data for designing a language program, and the connectionist model more applicable in designing the types of activity. (17) Each language gives cues with which it signals specific functions, and learners must be sensitized to the relative importance of the different cues appropriate in L2.
Content	(18) Learners learn best the discourse of domains they are familiar with.
Language biography and its consequences	(19) It will be useful to know which languages the learners know in order to detect the influence of nativization. Parameters and markedness can help to predict its paths.
Interaction and learning processes	(20) Meaningful interaction will trigger learning processes. Some form of intrapersonal cognitive work may prove useful.
Mediation	(21) Social mediation can be seen as mediation by others in social interaction, e.g. mediation through experts and/or peers. (22) Self-mediation is mediation by the self through private speech and introspection. (23) Language, but also portfolios, tasks and technology are forms of mediation. (24) Nativization (or assimilation) reinforces the need for mediation.
Processes	(25) Assimilation and accommodation, or nativization and denativization, are key processes in L2 learning. (26) Parallel processing may be a more productive hypothesis than linear or serial processing. (27) Input requires frequency of exposure. (28) Corrective feedback during meaningful interaction may be beneficial. (29) Noticing is seen as a decisive phenomenon in SLA, noticing the gap consists in noticing interlingual or intralingual meaningful differences. (30) Noticing is facilitated by input enhancement or flooding. (31) Depth of processing is what allows adequate form-meaning links. (32) Accuracy and fluency require that meaningful activities be integrated with form-focused activities, particularly those requiring output. (33) Focusing on form, noticing and restructuring of L2 is driven by the frequency and importance of the features in the learning situation, or though explicit rules. (34) Work on input/uptake should precede output which should not be required too quickly. (35) Pushed and comprehensible output in meaningful interaction can be useful. (36) The learnability or teachability of what is proposed should be questioned beforehand. (37) Translation may have a facilitating role which should be monitored.
Practice	(38) Practice, rehearsal and rote learning should not be discarded but integrated into meaningful activities (favoring noticing and deep processing).
Feedback	(39) Only systematic and explicit recasts will help. (40) Feedback may take the form of advice to perform tasks that help restructure L2. (41) Metalinguistic and metacognitive information must be given in accessible language.

successfully, especially in multicultural learning environments.

Difficulty of Integrating Culture

Culture is generally taught implicitly, imbedded in the linguistic forms that students are learning. Learners will have to cope with the interrelation of linguistic form(s) and cultural meaning(s). Culture cannot be taught the way language is taught, individuals may want to be proficient in L2 while retaining their cultural personality and being able to interact satisfactorily with their interlocutors. Intercultural competence is therefore defined in different terms from communicative competence.

Intercultural Competence and Intercultural Mediation

Byram (1997) has defined a model of intercultural competence including five elements (our adaptation). Two are preconditions for (successful) intercultural/interlingual interaction:

- Attitudes: relativization of self and value given to others, suspension of belief in own and disbelief in other's behaviors, beliefs and values.
- Knowledge of one another's behaviors, beliefs and values and of how each is seen by other. This requires comparative methods.

The next are necessary skills:

- Interpreting and relating 'documents'/'texts' based on existing knowledge and attitudes.
- Discovering (in own time or in interaction) new behaviors, beliefs and values.
- Interacting in real time based on other preconditions and skills. The responsibility of the teacher will be to develop 'critical cultural awareness'.

A person with these qualities has been called an 'intercultural speaker' (Alred and Byram, 2002). CEFRL descriptions include intercultural competence (Council of Europe, 2001).

More practical tools have been developed, (Hofstede, 2001, Trompenaars, 1996, etc). They can help build a reflection on the different cultural contexts. Responses will always be individual and a debate will always prove important. Online debates generally require a mediator to monitor the various responses (concept of cultural mediation, Byram, 1997).

Content

The role of content in L2 acquisition has been studied in chapter 3. Inclusion of content will make L2 something belonging to the real world and not something to be learned only. It will certainly be demanding for course designers that are not content specialists.

ACCOMMODATING SECOND LANGUAGE ACQUISITION THEORIES WITHIN A DUAL CYCLE OF TASKS: ORGANIZING THE CRYSTALS INTO A COHERENT WHOLE

This chapter has clearly underlined the need to integrate two complementary sets of theories (crystals 3 and 20). Learning and using a language is both an intrapersonal or mental process (White, 2003, p. 47) and an interpersonal or social and interactive process (van Lier, 1996). This integration is not always proposed in distance courses which tend to lean towards only one of the two sets (Lamy and Hampel, 2007).

Curriculum design has been advocated to rely on realistic social or disciplinary situations in order to trigger the required processes (chapter 3) (crystals 13 and 18). Authenticity does not seem to be the bone of contention it used to be. Access to

authentic documents is no longer a problem, and ICT makes it possible to design and run realistic interactive tasks, but practice may require tasks that are unrealistic (crystals 12, 13, 38). What matters is that they should provide opportunities for noticing, processing meaning and form in ways conducive to the use of L2 according to the learner's objectives or to negotiated objectives (crystals 29, 31). Such tasks should permit reliance on instances and/or rules to process and produce L2 and explicit reflection (crystals 14, 32, 33, 39).

A learning system requires quality indicators (White, 2003, p. 43): adequate and timely feedback (crystals 39-40), consistency between objectives, content, and assessment (crystals 21-22), and this is what is intended in the development of the learning cycle that follows. This model highlights a distinction between 'macro' and 'micro tasks'. Macro tasks correspond to the action-based perspective and are the actual real-world tasks: their design should meet the criterion of authenticity of task: "real world activities" (Ellis, 2003). Conversely, micro tasks primarily aim at developing specific language skills and are therefore closely related to linguistic or sociolinguistic theories. By creating needs, macro tasks define what is expected of micro tasks which in turn should ideally improve learner production for the subsequent macro tasks. The figure describes the way in which our theoretical assumptions condition our practice and guide us in our use of technology.

The social and economic environment is the macropedagogic level: sociology and economics play a great part at the level of decision-making in education, sometimes with a lack of epistemological responsibility (Narcy-Combes, 2005) which results in incoherent decisions. ICT cannot play a major role at that stage, though what it can do may influence decisions.

The learning system is at the technicopedagogic level and may be physical or virtual. This can also apply to the teacher.

As far as the cycle is concerned, organizing progress implies assessing the starting level of competence and setting learning objectives according to personal or individual goals and motives.

Macro tasks (chosen according to the sociocultural or professional needs of learners) trigger learning processes and reveal learning needs. In an ICT setting, they require the implementation of monitoring in order to organize follow-up and provide feedback to the learner. Aids (hardware) will be provided but no help (software). Scaffolding may, however, result from peer interaction. Feedback will take the form of formative evaluation, largely in terms of effectiveness of noticing and effects of nativization, but also in terms of strategies (crystals 21, 24, 40).

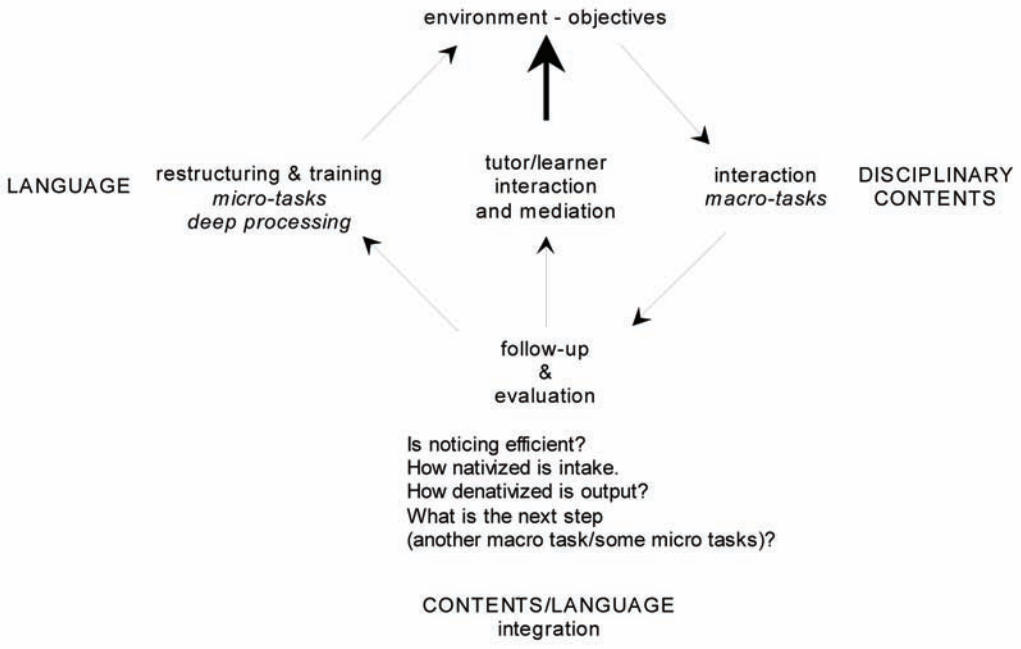
Depending on how effective the learner is, either more macro tasks will be suggested (further progress will be planned), or work on micro tasks will be negotiated in order to work on micro-points (language, culture, communication or content: this is "restructuring"), or eventually both types of tasks in parallel (crystals 12-17 and 25-37).

Micro tasks will require the use of ICT, but differently. They will also require the implementation of monitoring in order to organize follow-up and provide feedback to the learner. Aids (hardware) will be provided as well as help. Scaffolding may be provided by the computer. Feedback will take the form of formative evaluation, but will be handled more easily by the machine than for macro tasks. Micro tasks will be designed to trigger deep-processing and to avoid purely automatic drilling (crystal 31).

The human teacher/virtual teacher are complementary, neither isolated nor one merely a subsidiary of the other.

As far as feedback or correction are concerned, theory and practice show that advice given to help the learner produce more adequately is more useful than error correction (Narcy-Combes and Narcy-Combes, 2007) (crystal 40), as well as be-

Figure 1. The learning cycle



ing technically easier to handle. Suggesting new techniques for achieving identical micro tasks and explaining the reason why might prove more effective than error correction, and could also be technically easier to handle.

This approach clearly facilitates fluidity of content, and is not linear. Micro tasks in a given institution may be pre-organized and adaptable, while macro tasks will need to be designed for specific courses. Learners can select their material and design their own macro tasks singly or collectively. However, this assumes that tutors are able to respond adequately. To do so, they not only need to know L2, and how L2 is learnt, but also must be familiar with learner characteristics in order to counsel them appropriately.

This model (Figure 1), which is a completed version of Figure 5 in chapter 2, can prove useful in implementing partially or totally ICT-mediated learning systems. It takes into account what was developed in this chapter. It goes against the conception that language learning should be rigorously planned. The environment and the tasks should be seen as an organizing framework which creates the circumstances that will lead to learning (Spear and Mocker, 1984). Each of the learner's needs will be met as they arise from the encounters with L2 in the macro tasks which, up to a point, can be selected by the learners themselves (depending on the flexibility of the system). This has been operated in some language learning centres (Esch, 2001). ICT and CMC make it feasible in distance learning.

Because this model is constructed from a myriad of different concepts extracted from different theories, applying it will require some form of reflective practice, in the form of action research for instance, to measure the validity of the construction (see Preface).

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Chapter 5
The 'Learner' Pole

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INTRODUCTION

Learning is the process which connects all the poles of the model. Its description in the book has been placed between its object, one of our poles, language (L2 in a plurilingual context in our case), and the learner, our second pole, whose specific problems cannot be understood if the process has not been clarified. This second pole will be dealt with in this chapter. We should perhaps refer to learners in the plural if we accept the tenets of LeDoux (2003) when he says that in neurobiological terms all humans are similar in their construction, but that the multiplicity and variety of their experiences makes it impossible to study their actual psychological processes according to general universal principles. A learning cycle has been proposed in which learning is symbolized by the arrows. Defining the position of the learners regarding the cycle is more problematic. They experience the cycle in order to learn L2, their experience can only be described in individual terms as they follow the arrows.

OBJECTIVES OF THE CHAPTER

In this chapter, a number of subjects will be studied in order to be able to understand what the learners undergo as they follow the arrows. This understanding will be applied to organizing an adequate learning and mediating environment. The content of the chapter will cover the questions that are generally associated with L2 learners:

- aptitude and multiple intelligences,
- strategies and techniques,
- styles,
- anxiety,
- personality, identity, attitudes and motivation,

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- language learning awareness,
- autonomy,
- reflective interaction,
- learner training.

Readers may be benefit from comparing their initial beliefs regarding these points with what is developed in the chapter which will be summed up in a synthetic table. Inferring, in a group or individually, how this will be taken up in the cycle before reading the concluding lines (*the learning cycle in a distance environment and the learner*) may prove a worthwhile reading task leading to a fuller discussion.

INDIVIDUAL DIFFERENCES IN SECOND-LANGUAGE LEARNING

White (2003, p. 90) speaks of learner dimensions. The word is very appropriate but may refer to more than mere psychological parameters. However, in this subpart, our study will be restricted to such parameters.

Aptitude

Aptitude corresponds to what White calls *innate language acquisition capacity* (2003, p. 89). This reflects the belief in a gift for languages, but Gardner's description of multiple intelligences (2000, see below) has made it more acceptable to think in terms of aptitude again. The previous chapters have shown that there may be innate capacities, but early experiences can also explain why an individual may develop one form of intelligence to a higher degree than other forms. As course organizers and tutors, all we have to do is see this as a problem to be understood and solved.

Carrol's results (1962) were disregarded for some years in many circles, probably because they underlined inequalities among students that were deemed inacceptable at the time. The situation has changed, learning practices are no longer seen as mostly collective, and individual work causes differences to appear more clearly. However, these differences can now be addressed positively. Carroll's model has been known since the early days of applied linguistics. It has been very influential, but theoretical changes in what learning L2 is all about (see chapter 4) explain the emergence of a more recent model.

Carroll's Model

According to this model, aptitude includes:

- phonetic coding ability;
- grammatical sensitivity;
- rote learning ability;
- inductive learning ability.

Some of these descriptors are not explained in terms corresponding to the dominant theories of the field today. Grammatical sensitivity is not necessarily seen as the ability to recognize the grammatical function of a lexical element (word, phrase, etc.) nor would rote learning be described as learning associations between words in a foreign language and their meanings and retaining that association. These processes are now described slightly differently as was seen in the previous chapter.

Skehan's Model

Skehan (2002, p. 69-82) adapts the model to include concepts that have been described in chapter 4. He points out three basic components:

- auditory processing (connected to noticing), which would include the phonetic coding ability;
- language processing (combining rule-based analysis and instance-based processing);
- memory, seen in its complexity (implicit/explicit and rule-based and instance-based).

According to Skehan, present-day research does not invalidate the findings of earlier research, in particular the correlation between aptitude and success (2002, p. 83). Consequently support and expectations will have to be adapted to each learner. Aptitude and its effects can be connected to mastery orientation (see below), and teachers must make sure that care is taken not to de-motivate the learners with unrealistic demands. There is a correlation between results in L1 and results in L2 or more languages (Cooke, 2001). Knowing the linguistic past of the learner will provide useful information (see European Portfolio, Council of Europe, 2001) in terms of aptitude and guidance.

Multiple Intelligences and Choice of Themes and Tasks

The theory of multiple intelligences was developed by Gardner (2000) who puts forward that the notion of intelligence, based on I.Q. testing, is far too limited. Gardner proposes eight basic different intelligences (more recent forms have been proposed, but they do not apply to our domain):

- linguistic intelligence;
- logical-mathematical intelligence;
- spatial intelligence;
- bodily-kinesthetic intelligence;
- musical intelligence;
- interpersonal intelligence;
- intrapersonal intelligence;
- naturalist intelligence.

Gardner says that, too often, the focus of institutional attention is on linguistic and logical-mathematical intelligence, and this certainly applies to France. Task design, when based on real-world activities in different domains, will give each learner an opportunity to be successful, especially if he or she can select the material from which to learn L2. This way, learners with forms of intelligence other than linguistic intelligence may be more motivated to learn L2.

Strategies and Techniques

Research has long shown that learners use different language learning strategies, or specific actions and behaviors to help them learn. Their strategies differ, partly because their learning styles (overall approaches to learning and the environment) are varied due to the variety of their learning experiences (see below). Early research (Oxford, 1990 or Narcy, 1990, for instance) suggests that learning style has a significant influence on learner choice of strategies, and that both styles and strategies affect learning outcomes.

Language learner strategies result in often conscious steps or behaviors used by language learners to facilitate the acquisition, storage, retention, recall and use of new input (Cohen & Macaro, 2007). Strategies have been assessed in a variety of ways such as diaries, think-aloud procedures, observations and surveys. Research shows that successful learners tend to use learning strategies that are appropriate to the material, to the task and to their own goals, needs and stage of learning. Advanced learners use a broader range of strategies and take more risks than do less successful learners, but the correlation between strategy use and proficiency cannot be easily established. Language learners are shown to use strategies at all levels (Chamot & Kupper, 1989), without being fully aware of how efficient their strategies are nor of the possibility of working in different ways. Techniques result from conscious decisions to act in a certain way to process language reception or production. The decision to look up a word in a dictionary may block a strategy (inference).

Different classes of strategies have been described (Oxford, 1990):

- metacognitive techniques (organizing, focusing, and evaluating one's own learning);

- affective strategies (handling emotions or attitudes);
- social strategies (cooperating with others in the learning process);
- cognitive strategies (linking new information with existing schemata and for analyzing and classifying it);
- memory strategies (entering new information into memory storage and retrieving it when needed);
- compensation strategies (such as guessing or using gestures) to overcome deficiencies and gaps in current language knowledge.

Choice of language strategies also relates strongly to culture, language learning purpose, the nature of the task and other factors often regrouped under the heading of educational culture (Duda, 2001).

Language learner strategy reflection can lead to an overemphasis on metacognitive and cognitive strategies and on strategy training, which may be counterproductive (Narcy, 1997), as shown by the disappearance of exclusively learning to learn material (Sinclair and Ellis, 1987 & Narcy, 1991, for example). Learners can be sensitized to use more adequate strategies, and research suggests that this will improve language performance, but strategy training is generally more effective when woven into regular activities than when presented as a separate strategy course (Cohen & Macaro, 2007), this result corroborates the concept of the learning environment as an organizing circumstance (Spear and Mocker, 1984, in chapter 4).

Course and task design should be organized in order to meet the needs of individuals with different stylistic preferences and to make sure that learners are sensitized to the effects of their learning strategies on their work.

Styles

The link between styles and strategies is not very clear. Inadequate styles may result in learning difficulties (White, 2003, p. 90) and great attention must be paid to that. The term learning style is used to describe four aspects of the person:

- *cognitive style, i.e., preferred or habitual patterns of processing data, which is the most familiar aspect;*
- *attitudes and interests that will determine how individuals will focus their attention in a learning situation;*
- *a tendency to recreate learning situations compatible with habitual learning patterns;*
- *reliance on preferred learning strategies and avoidance of others.*

Learning style is described as inherent and pervasive (Willing, 1988) and is a blend of cognitive, affective and behavioral elements (Oxford, 1990). Learning styles are generally described in dichotomic pairs which may not be exclusive of the others. Among these pairs can be listed:

- Field independence vs. dependence. Field independent learners easily separate key details from a complex or confusing background, whereas field dependent learners find it difficult. Field independent learners show significant advantages over field dependent learners in analytical tasks, and a link can be found with the next pair (Narcy, 1990).
- Analytic vs. global processing is closely related to field independence vs. dependence. Research has shown that global processing is not conducive to noticing (Narcy, 1990), and that success or failure in some learning contexts were due to an overly analytical approach that left the global processors aside, but did not lead the analytic learners to successful language learning either. However the more holistic approaches also leave the global processors aside, which is not so surprising, since the more analytic

learners are likely to find a means to notice what is important. Hemispheric preference has been seen as connected to both of these pairs. The left hemisphere of the brain deals with language through analysis and abstraction, while the right hemisphere recognizes language as more global auditory or visual patterns. It was initially speculated (Willing, 1988 or Leaver, 1986) that right-brain learners are more apt at learning intonation and rhythms of the target language, whereas left-brain learners cope better with analytic aspects of target language grammar. The separation has been shown to be more complex, yet attention must be paid to maintain a balance between so-called right and left brain activities.

- Cooperation vs. competition is a distinction that could help in the context of distance learning. In studies where students were taught specifically to be cooperative, the results revealed vast improvement in language skills as well as increased self-esteem, motivation, altruism and positive attitudes toward others (Oxford, 1990).
- Tolerance for ambiguity vs. intolerance for ambiguity is another style dimension of language learning, which was associated with the 'good language learner' theory (Ellis and Sinclair, 1989). It was assumed that 'good language learners' were tolerant of ambiguity.

More pairs have been described: extraversion vs. introversion, sensing vs. intuition, thinking vs. feeling, judging vs. perceiving, and other interesting classifications can be found (Kolb, 1984). Several of these dimensions appear to significantly influence how students choose to learn languages. Less research interest seems to be vested in strategies and in styles, though Cohen & Macaro (2007) shows a renewal of interest. This reduced attention does not mean that styles and strategies should be ignored, but that it is difficult to be conclusive in these culturally embedded components of second language learning as exemplified by the shift in Oxford's interests (Oxford, 1996).

As far as learning styles are concerned, as with strategies, what matters is to have a flexible approach to task design which will enable each individual learner to feel comfortable and to be able to adapt his or her way of working by reflecting with the tutor, or with peers, on how effective his or her way of working seems to be. Educational culture and personal attitudes must be taken into account, and tutors will have to refrain from being too technical in some circumstances. Narcy (1990) recounts episodes that show that learners could be perturbed when discovering they were analytically or globally oriented depending on what their beliefs were regarding success in learning L2, debating such problems with peers often leads to more convincing results.

Anxiety

The effect of anxiety has been studied by Gardner among others (1985, 1991). Lamy and Hampel (2007, p. 79) describe its consequences in second language distance settings, some are predictable, others result from, or are increased by, the specificity of the learning situation:

- communication apprehension;
- low self esteem;
- inadequate reference (native speaker);
- techno-stress;
- cognitive load.

Anxiety often results from insufficient skills (or skills that are perceived as insufficient), or from insufficient challenges, which do not trigger off interest or motivation as shown in the concept of flow seen as the balance between skills and challenges (van Lier 1996, p. 106). Course and task design should take this balance into account.

Mismanaged anxiety caused by distance and asynchronous communication may result in

'flaming' or anger which can be explained by a series of mismatches: between mature thoughts and immature L2 proficiency (in the case of monolingual learners of L2 in particular), but also between what is perceived and what was meant by the interlocutor. An intercultural mediator will help reduce anxiety and tutors should be trained to detect the signs of anxiety which may be reflected in many other ways than flaming.

Personality and Identity

Distance is going to affect the consequence of these two related characteristics in unpredictable ways. Introversion and extroversion have always been the dominant personality factors connected with second language acquisition (MacIntyre & Charos, 1996), but many other traits can be taken into account. However, they will not be easily perceived and it might be advisable to find ways of detecting personality factors by setting specific interactive tasks at the very onset of a course.

Identity and language have been shown to be in close rapport (chapter 3) and this should be assessed (measure of attitudes, etc.). Distance will not facilitate this task since personal questions are to be avoided in some cultural environments.

A very important point is to know to which factors the choice of distance can be attributed. Attitudes and motivation are likely to be very different if material or professional causes explain the choice or if this choice results from the specific desire to work on one's own.

Learner Beliefs and L2 Acquisition and Attitudes

The aim of this paragraph is not to delve deeply into this subject: readers can refer to the literature (Gardner and Lambert, 1972, Skehan, 1993, McIntyre and Charos, 1996, Mori, 1999, among others). Beliefs do not change rapidly but are best made explicit. White (2003, p. 90) reminds her readers that the learner beliefs on the construct of self as learner, of teacher, and their conceptualization of what a learning environment is, or should be, affected by learning at a distance.

Learners will have to submit to internal regulations instead of the more traditional external regulations (White: 137) and the learning functions will have to be activated by each learner rather than by instruction. Some forms of instruction will remain useful but they should arise from the tasks rather than be given *a priori*.

As a consequence, at the beginning of the course, tutors will need to know (White, 2003, pp. 134-135):

- *learner expectations and initial beliefs*
- *which aspects of distance learning to they have expectations about;*
- *changes in expectations as the course advances;*
- *beliefs learners develop as they experience the course.*

Attitude questionnaires can help assess these points, however, specific tasks for getting to know each other and commenting the course may prove more effective for trained tutors and less disturbing for the learners, if they can be organized on or offline.

Motivation

Motivation has been identified as the learner's orientation with regard to the goal of learning a second language (Crookes and Schmidt, 1991). Motivation is a complex phenomenon that has been described in diverging and sometimes conflicting ways. Attempts have been made at unifying the concept (Dörnyei, 2009), but it still remains a complex subject. Dörnyei (2009, p. 16) describes three stages in the research concerning motivation and this chapter will be ordered accordingly.

The Social Psychological Paradigm: Instrumental vs. Integrative Motivation

In this theory, the most successful learners of L2 are those who have an affinity for the people that speak the language, admire the culture and have a desire to become familiar with or even integrate into the society in which the language is used (Falk, 1999). This form of motivation is known as integrative motivation (Gardner, 1985).

Another form of motivation is referred to as instrumental motivation. This is generally characterized by the hope to obtain something practical or concrete from the study of a second language (Hudson, 2000). The purpose of language acquisition is more utilitarian (meeting the requirements for school or university graduation, applying for a job, requesting higher pay based on language ability, reading technical material, translation work or achieving higher social status). It is seen as related to situations where little or no social integration of the learner into a community using the target language takes place, or no real wish to integrate into that community.

The Cognitive-Situated Paradigm: Intrinsic vs. Extrinsic Motivation

Attribution Theory

Because of internal desires to perform a particular task or because it is morally acceptable, people do certain activities, and develop particular skills. Extrinsic motivation is based on factors external to the individual and unrelated to the task they are performing (money, good grades, and other rewards) (Deci and Ryan, 1985).

Intrinsically motivated learners are supposed to do much better because they are willing and eager to learn new material. Their learning experience is more meaningful, and they go deeper into the subject to fully understand it. Maslow (1954) has concluded that before we can be intrinsically motivated, we must first satisfy some more basic human needs, and though this has sometimes been disproved, it cannot be denied that intellectual pursuits will be more successful when learners are fairly secure in their daily life (and this should be assessed in a distance course).

In attribution theory, people are shown to explain their successes and failures (and those of others) by attributing them to internal or external, stable or unstable factors, and by seeing the cause as controllable or not (locus of control) (Bandura, 1997). Attribution to internal factors and a sense that the locus of control is in the self is postulated to lead to success.

Mastery Orientation / Performance Orientation

The majority of the research on motivation has resulted in an essentially dichotomous theoretical grounding. Integrative or intrinsic forms of motivation are adaptive and mastery-oriented, and hence desirable. Instrumental or extrinsic forms of motivation, on the other hand, are viewed as maladaptive and accordingly undesirable (Midgley et al, 2001).

Achievement goal theory provides a framework for motivation which avoids this dichotomy and has led to the characterization of the learner not as motivated or demotivated, but as an individual motivated by and within given conditions (Brown, 2007). Students who lack motivation for learning foreign languages, for example, are almost certainly motivated by other disciplines. From the point of view of language-learning motivation, these other disciplines distract the individual, causing the language-learning task to fade into the background. Midgley et al. (2001) define two different achievement goals. The first is the acquisition or mastering of a given knowledge or competence, usually referred to as a mastery goal. The second factor is the capacity to formally demonstrate one's knowledge or competence, and is usually referred to as a performance goal. Orientation towards one or the other of these two possibilities is the outward sign of divergent cognitive and affective schemata,

reflecting a different link between the goals and identity in the two orientations. Teachers may be assumed to have mastery orientation regarding L2, especially when they are non-native speakers of L2, and learners may or may not have the same orientation (this has been shown in the way input was processed in ways not expected by teachers, see chapter 5). Tutor guidance must not reflect this difference in attitudes which is detrimental to learner success.

The Identity-Construction Paradigm

Mastery and performance orientations have shown how identity is related to motivation. The mastery/performance theory remained dichotomic while avoiding undertones of moral issues. This dichotomic view of motivational research has now been discarded, making the explanations more convincing and conversely the applications more complex, as will be seen below.

Process-Oriented Motivation (Motivational Change)

Initially Dörnyei (2001) proposed a process-oriented model which accounts for the ups and downs of motivation. His most recent proposal, reminiscent of Freudian theory, has very interesting features that should be implemented and validated. The model confronts an ideal L2 self, an ought-to self and the L2 learning experience, and claims to cover the internal desires of the learner, the social pressures exercised by institutions, tutors and significant figures, and the experience being engaged in the learning process (Dörnyei, 2009, p. 18). The interplay of these influences can explain motivational changes. Channouf (2004) reminds us that individuals do not access their inner states directly and require self-observation and mediation to do so. Consequently Dörnyei's new model will require tutors who are capable of counseling (Curan, 1972).

Investment

Language learning is a complex endeavor that depends on both universal cognitive processes and on the social context. An individual's motivation is rooted in his or her social surroundings as well as in him or herself. Ethnographic approaches for analyzing the processes of second language learning have been carried out (Norton, 1995). Such research emphasizes that L2 is not simply acquired through persistence and practice. It involves complex social interactions and power differentials that engage the identities of the learners.

When people speak a language, they are investing in an identity as speakers of that language. They do so in order to gain access to resources such as education, social acceptance and material gain. They expect a "return" on their investment (Bourdieu, 1979). A learner's investment is subject to variations over time and space, depending on the momentary conditions of identity and power. Norton (1995) uses the term 'identity' to refer to how people understand their relationship to the world, how that relationship is constructed, and how they see future outcomes.

In some ways, investment can be measured before a course begins, since it is not directly related to the course. Attitude measurements may show how much a learner is likely to invest in a course and whether this is going to compensate the effects of the difficulties encountered during the course. More research will need to be carried out before such instruments are readily available or before tasks or activities can be proposed that will reveal the nature and degree of the learners' investment.

Motivation as a Complex and Crucial Phenomenon

The new approaches to motivation show that it is now seen as a phenomenon that engages the identity and the values of an individual. This position reorganizes the study of individual differences

into a complex whole, since all the characteristics that have been described under that heading are combined in justifying the ups and downs of motivation. This view of motivation as the result of all the individual features of a person, in given circumstances, is evidenced in Dörnyei's practical book in the English Language Teaching Library collection (2001), since this book covers every aspect of classroom teaching.

Distance Learning and Motivating Opportunities

Problem-solving and discovery approaches have long been assumed to be effective with learners. Both Piaget (1970) and Vygotsky (1978) advocated such practices, the former saw it more as an individual pursuit and the latter as a collaborative endeavor mediated by the teacher and scaffolded by peers, eventually leading to processing. In France, Celestin Freynet (1994) has also been an advocate of discovery collaborative work. The literature of CMCL abounds with descriptions of such courses (Lamy and Hampel, 2007) which lead to more acceptable results than traditional linear courses (Warschauer and Kern, 2000). Research has shown some of the potential risks (Grosbois, 2006): phonological nativization, and limited amount of potential acquisition in collaborative activities if tasks are too loosely designed. Awareness of the problems that arise in second language learning, more specifically at a distance, will have to be raised since nativization and distance may cause unwanted effects disguised in initially successful practices.

Discovery tasks and problem-solving activities will prove motivating and should be encouraged. But other factors can contribute to motivating learners at a distance. Lamy and Hampel (2007, p. 83) quote research that shows that CMCL can increase intrinsic motivation by allowing learners to:

- *write for a real audience;*
- *develop useful technical skills;*
- *communicate with distant partners;*
- *work collaboratively;*
- *create projects that reflect their own interest;*
- *participate in authentic exchanges with peers and/or native speakers.*

Empowerment has also been shown to raise motivation (Lamy and Hampel, 2007, p. 83), but this will depend on the learners' initial educational culture and on how the course can develop awareness and autonomy. As in self-directed learning (Candas, 2009), individual work goes with anonymity, which may make some learners feel safer and under less pressure. This may be misleading even if it is initially profitable.

According to Lamy and Hampel (2007, p. 77), participation in given tasks may be comparable to participation in classroom activities. However, distance may amplify personality differences and increase inequalities in participation. Individual characteristics will play a role which may not be perceived initially. Distance language learning often results in a consistent number of learners dropping out of courses (Albero, 2003, White, 2003) and this phenomenon should be reduced. Unobtrusive but effective ways of maintaining motivation must be found while bearing in mind that, as in self-directed learning or in classroom teaching, some learners will not be motivated for reasons that are beyond the responsibility and care of the tutor.

LANGUAGE (LEARNING) AWARENESS AT A DISTANCE

Distanciation and Denativisation

In chapters 3 and 4, the effects of nativization and of cognitive conditioning have been described.

Human psycho-cognitive construction in social interaction, noticing and deep processing have been presented as processes likely to lead to nativization, which resulted in a need for metacognitive and metalinguistic reflection since explicit learning is assumed to facilitate the learning processes. Distance learning settings will obviously affect the way such reflection can be implemented.

Metacognitive Experiences

At the onset of a course, a number of questions are raised (Wenden, 1999, in White, 2003, p.140):

- *How do learning settings shape learners' beliefs and knowledge?*
- *How do beliefs and knowledge change over time? From one learning context to another?*
- *To what extent does the learners' active involvement in the regulation of their learning lead to changes in their beliefs and metacognitive knowledge?*

There are many ways to find answers and some have been suggested in earlier pages.

Awareness raising activities should not be threatening and initial beliefs should be assessed as unobtrusively as possible. Questionnaires can prove useful, but they can be replaced by synchronous or asynchronous debates in which even 'silent' participants may see that beliefs and practices are not common to everyone and that other ways of learning can be pleasant and effective as well. Some specific tasks can be designed as awareness raising and learner training activities and assigned at the beginning of the course, followed by a debate. Tools can be suggested to maintain and develop awareness, e.g. logbooks, forums, etc., or all tasks can be accompanied by a (short) self-assessment instrument.

Going through the different tasks and reflecting with the tutor or with peers will lead to personal adjustment. The learner will create a more adequate learning environment, will adapt his or her circumstances to the demands of this environment and will change his or her initial attitude (beliefs, affect, sense of responsibility). In some cases, exchanges with the learners or between learners will indicate a need for environmental restructuring (White, 2003, p. 143). Early drop-out is probably a sign that the learner has not been able to cope with some of these adjustments. An initial interview or questionnaire might have sensitized this learner to incompatibilities that could not be overcome easily.

Reference to the preceding chapters can help determine a list of what must be clear in order to create an effective interface with the learning context:

- computer literacy and language learning at a distance;
- awareness of one's attitude to learning this specific L2 (as opposed to other languages);
- awareness of one's techniques and strategies (from prior language learning experiences);
- awareness of one's strong and weak points in language learning (I speak other languages, I can take risks, I have a good ear, I don't like to make mistakes, …);
- need for and value of mediation and collaboration;
- ability to use online or offline metacognitive tools (e.g. logbooks, forums…);
- training to notice the gap (cultural, linguistic, phonological, conceptual);
- understanding the need for and value of practice;
- value of self-assessment…

Awareness raising activities have long been carried out (Sinclair and Ellis, 1987, Hawkins, 1985) in classroom settings and in self-directed learning. Distance complicates the situation and raises a more fundamental issue, that of autonomy.

AUTONOMY AT A DISTANCE

Introduction

Autonomy has long been associated with language learning (Holec, 1998, Little, 1997, and with the development of self-directed learning (Esch, 2001, or Candas, 2009). The term may be misleading and some recent developments may help build a more adequate vision of what the concept of autonomy entails.

Autonomy, Independence and Control

Candas (2009), in her study of autonomy in self-directed learning defines four indicators of autonomy:

- Exploration of learning potentialities;
- Control of the learning process;
- Adequate use of learning routines;
- Management of constraints;

White (2003, p. 165) raises the issue of control and interestingly sees it as one of balance. 'If control remains in the hands of the teacher, this militates against 'both reflection and facilitative interaction' (Van Lier, 1996, p.180). Self-directed learning has long placed control in the hands of the learner, but this change of locus depends upon a number of factors which White (2003, p. 151) describes as: 'the opportunity (independence) and ability (proficiency) to direct the course of activities and experiences, together with the necessary resources (support).' Further on, she adds (2003, p. 152):

'The notion of collaborative control in distance LL is based on the idea that while cognitive autonomy is largely the responsibility of each learner, this autonomy does not imply social independence.'

This concept of interdependence is a key concept as far as autonomy is concerned. If humans cannot easily access their inner states and the motives for their behaviors (see chapter 4) and may benefit from mediation to do so, then they will feel better if they accept interdependence. Autonomy will partly result from a capacity for decision making (independence), metacognitive and cognitive awareness (proficiency) and support (mediation: interdependence).

Ability to direct the course of activities depends on the way learners assess the learning potentialities of the different materials, tasks and activities they encounter and of course on the way they assess the potentialities of the global learning environment. Reflection is required to develop this ability as it implies the ability to measure the adequacy of learning routines. Such reflection can be individual or shared with the tutors and peers as has been said previously. It requires an understanding of what learning and second language learning means and of the way each individual constructs his or her own knowledge as well as a capacity for acting accordingly. Kelly (1955) stated that it was each human's responsibility to do so and called it epistemological responsibility. Epistemological responsibility cannot be fully reached without some form of mediation but it seems a very reasonable goal if humans want to be autonomous.

Interestingly White (2003, p. 132) stresses the importance of the notion of epistemological fit in distance courses seen as the absence of gap between course or tutor stance. The gradual development of the reflective critical capacity of the learners aims at informing their judgment about what is required of them so that they develop a finer understanding of how to proceed through the course (White, 2003, p. 147). What is suggested as important in distance learning situations corresponds to what research in self-directed learning reveals (Candas, 2009). Candas's indicators can be applied and compared to what other researchers have described:

- Exploration of learning potentialities = setting up awareness of their learning experiences (White, 2003);
- Control of the learning process = sense of themselves as language learners, and a knowledge of their abilities (Lamy & Hampel, 2007);
- Adequate use of learning routines = self-management (White, 2003);
- Management of constraints = developing new ways of being a learner, such as being willing to proceed when things are not entirely clear (White, 2003).

We have seen, though, that the list would be more complete with the addition of two more indicators: management of interdependence and responsibility.

Autonomy is not an innate capacity and we agree with Lamy & Hampel (2007, p. 83) who write: *...empowerment is problematic if the constructivist approach disturbs the learner and if his technical/learning skills are not adequately developed*. Autonomy cannot be imposed and when White (2003, p. 88) reminds us that *learners do not enter a course, they construct their course*, we should bear in mind that they construct the course they are capable of constructing and not the course they were planned to construct (see Spear and Mocker, 1984). Learner autonomy in distance learning is not strictly a learner characteristic. It will depend on the adequate interplay of the abilities and competencies of the learner to engage in a learning experience, the motivation and confidence needed to persist and succeed in a learning endeavor and the resources available that facilitate meaningful, effective learning, and that assist the learner to participate successfully in the distance course (Lamy & Hampel, 2007).

From the course manager's and the tutors' perspective, it is obvious that independence *needs to be balanced with a concern for support and recognition of the demands placed on learners* (White, 2003, p.151). Institutions may have economic requirements that result in courses with limited support. In self-directed learning, especially in the context of adult education, needs analyses are often carried out in the form of pre-course interviews or tasks/tests (Labour, 1998, Toffoli, 2000 or Beaufils, 2007). These can be adapted to distance learning settings in order to see how ready learners are to cope autonomously with the demands of such courses, and what form of support they will require in the course accordingly. Great care will have to be taken to adapt such practices to the various cultural environments.

Autonomy and Achievement

The conclusion of the previous paragraph is fully justified by what is termed '*the discrepancy between learners' assumed autonomy and their actual skills* (Kötter 2001, p. 332, in Lamy & Hampel, 2007, p. 84). Distance learning and CMC require more self-direction, initiative and motivation on the part of participants than more traditional learning spaces (White, 2003, p. 23). Learners used to working in traditional settings will need to be sensitized to the fact that the locus of agency is to be modified (Bandura, 1997) and distance learners need to become aware that they are key agents in the construction of the interface (White, 2003, p. 93). This may initially trigger off more or less conscious resistance which may be countered by some form of learner training in the form of reflective interaction.

REFLECTIVE INTERACTION IN DISTANCE LEARNING

Critical Interaction

Hewling and Goodfellow (2005) argue that in a distance learning context, autonomy is best developed through opportunities for reflection on the use of learning strategies and experiences in the form of critical interaction. White (2003,

p. 165) describes research results that show that neither monologue-type texts nor social conversation-type texts were seen as contributing significantly to language learning. However, conversation messages display both reflexivity and contingency. The notion of 'contingent interaction, based on the work of Van Lier (1996), explores power relations in the classroom and the kinds of interactions that take place between teacher and learner. It is characterized not only by equality among participants, but also by communicative symmetry (in terms of distribution of turns and roles) and a balance of familiar and unpredictable subject matter. A theoretical connection with the concept of organizing circumstance (Spear and Mocker, 1984) can be made at this point. Both concepts rely on the notion of unpredictability as a factor of importance in learning situations, which is in opposition with the tradition of planned, linear courses but will initially cause some forms of resistance if learners are not prepared since beliefs in the linearity of learning are persistent (Candas, 2009).

Interaction and Affiliation

White (2003, p. 131) suggests that attention should be paid to ensuring a fit between the new learning environment, the learners' own contexts and their attributes as individual learners, early in the course. She advocates the need for some correspondence between the values of the course provider and those of the learners. This corresponds to her description of epistemological fit (see paragraph on autonomy).

She maintains that collective affiliation must be ensured, but a sense of belonging will not be easy to foster, and such a sense may be alien to some learning cultures. Course-related interactions, and dealings with support services, as well as face-to-face tutorials (when possible) and other opportunities for contact can go part of the way, complemented by speedy responses to contacts initiated by students and empathy and encouragement in the interaction (examples can be found in White, 2003, p. 132-133).

In traditional learning situations, most of the learning functions are monitored by the teacher, whereas in the distance context the learners need to assume more responsibility (White, 2003, p. 139) and interaction with peers may facilitate the process.

Interaction at a Distance

Very clearly, the absence of real-time face-to-face interaction is central to the challenges of language learning at a distance (White, 2003, p. 22). Synchronous tools (telephoning, conferencing, etc.) increase a sense of social presence and group cohesion and may be more efficient than asynchronous tools which are less complex and more economical to run. However, social relationships require some careful building since misunderstandings are likely to occur more frequently than in other courses, due to an initial need for intercultural and/or interpersonal mediation. Lamy & Hampel (2007, p. 86) describe the concept of performative identity (which is built during interaction), which in some ways can be related to the co-construction of culture seen in chapter 3 and to the concept of multiple identities developed by Lahire (2001) as described in chapter 3. What will matter is the fit between this performative identity and the personality of the learner: absence of fit, or mismanaged tensions, may result in ineffective interaction and learning. More research is needed into this aspect of interaction.

LEARNER TRAINING IN DISTANCE LEARNING EDUCATION

White (2003, p. 149) quotes Tudor (2001) who proposes two approaches to learner training:

- *strategy development and learner training through materials design;*

- *involving learners in choosing and accessing personally meaningful learning opportunities in the context of social interaction.*

To which we would add opportunities for reflective practice with the tutor and with peers as done in self-directed learning (Esch, 2001, and this chapter), but relying on the tools that CMC now provides.

Ways of identifying learner profiles should be defined (White, 2003, p. 104), focusing on both the institutional context and the specific context of each learner (personal circumstances, characteristics, conditions and attributes, social/work/family environment, and what the distance language learning environment entails for the learner).

As was seen before, needs analysis may help the tutor identify who the learners are before the course commences (White, 2003, p. 49). Adaptation and participation will be facilitated if adjustment can be made at that stage. The learners will undergo changes as the course develops, starting as a novice with a number of expectations and gradually becoming an expert with new beliefs. Early expectations have to be made explicit in order for the course team to be able either to implement the necessary adjustment or to sensitize the learners to a need for more adequate expectations, thus helping them to understand and adapt to the learning environment.

Flexibility will be gained from a learner-focused approach and this concept goes against the mass production of materials, the centralization of decision-making about learning and constant accommodation to rapidly changing technological advances which lead to linear, planned learning that does not correspond to the ways learners actually work (see chapter 3).

Learner attributes have been listed (White, 2003, p. 128) corresponding to what was seen in this chapter:

- *ability to meet deadlines, and to develop effective time management,*
- *ability to make the psychological adjustment to learning at home;*
- *self-management skills to organize one's life efficiently and effectively;*
- *motivation and discipline;*
- *ability to manage the loneliness of distance language learning;*
- *ability to self-monitor for personal control over the learning process;*
- *ability to assume personal responsibility for learning.*

No perfect fit between learners and this list will be met, but advising the learners will be easier if problems can be detected rapidly because such a list is available.

Awareness of the Learning Process

Learner awareness of the learning process will be directed to what the study of previous learners has shown to be of importance (White, 2003, p. 139). Learners need to:

- *Motivate themselves;*
- *Make connections within the learning materials and to their own level of knowledge;*
- *Deal with uncertainty;*
- *Evaluate their learning;*
- *Identify problems;*
- *Find further examples or counterexamples;*
- *Manage the learning environment.*

Candas (2009) provides very similar descriptions in self-directed learning contexts. As was seen before, support and some form of tutorial help are needed as well as debates and fluency-related interactive tasks in order to develop an effective interface between each distance learner and their particular learning context (White, 2003, p 89). This should maintain persistence and reduce the

risk of drop-outs. Sensitization to the positive and negative aspects of CMCL-supported distance learning can be effective (Lamy & Hampel, 2007, p. 77) if a debate on how to relativize and to overcome the negative aspects is organized.

Among the positive aspects of CMCL they list:

- *Equality of participation* (all learners have the same opportunities to participate)*;*
- *More turns;*
- *Learner empowerment and autonomy, control of discourse by learners;*
- *Time to reflect;*
- *Less anxiety;*
- *Greater opportunities for collaboration;*
- *Authentic exchanges;*
- *Creativity.*

The negative aspects they include (same origin):

- *inequality of participation* (learners do not all take advantage of the opportunities to participate);
- *lengthy monologues, flaming;*
- *limitations of learner empowerment and autonomy through greater control by tutor/ institution;*
- *pressure to respond (prescribed number of contributions in asynchronous fora);*
- *increased performance anxiety;*
- *solitude of collaborating at a distance;*
- *lack of paralinguistic cues and contextual deprivation leading to misunderstandings;*
- *information overload and techno-stress.*

This list is long and will be de-motivating if a debate does not show that such aspects can be seen in other forms of learning and that they can be compensated.

As is the case in self-directed learning, awareness raising activities will remain unobtrusive and non-threatening, and will take into account the personal and cultural sensitivity of each individual learner.

Language Awareness

Learner training also consists of specific L2 meta-reflection in order for the learners to understand what learning an L2 implies, and how this process will be affected by distance.

As was seen before, such tasks have long been available in the classroom context or in self-directed learning (Ellis and Sinclair, 1989 and Narcy, 1991, and more recent authors (Rosen, 2009), and they can easily be adapted to distance learning courses in the form of macro or micro tasks.

Ways of Overcoming Difficulties

CMC provides new opportunities to help overcome the specific difficulties resulting from working at a distance (White, 2003, p. 158). Learner networks can be implemented and peers can be paired or grouped. Collaboration is shown to improve learning both in terms of process and of product (Rees, 2003), and collaborative tasks (pair work or group work) can be suggested in synchronous or asynchronous forms.

SYNTHESIS

Table 1 will sum up what has been seen thus far.

As in the previous chapters, the individual teacher may feel overcome by the weight of what must be taken into account. Team work can certainly ease the burden and the creativity of the individual tutor or course organizer. The concluding section of this chapter will describe how the learner can be represented in the cycle and how the cycle can cater for what was studied in the chapter.

Table 1. Synthesis of chapter 5

Aptitude/multiple intelligences	Aptitude has been revisited to accommodate the dual nature of language processing. Aptitude measurement will prove more useful when combined with measurement of which form(s) of intelligence the learner has specifically developed.
Strategies,techniques and styles	Course and task design should meet the needs of individuals with different stylistic preferences and make guarantee that learners are sensitized to the effects of their learning strategies. Techniques can be discussed among peers, and new techniques suggested to counteract ineffective strategies. A flexible approach to task design will enable each individual learner to feel comfortable and to be able to adapt his or her style way of working by reflecting with the tutor, or with peers, on how effective his or her style is. Educational culture and personal attitudes must be taken into account.
Anxiety	Mismanaged anxiety caused by distance and asynchronous communication may result in problems arising from discrepancy between mature thoughts and immature L2 proficiency, but also between what is perceived and what was meant by the interlocutor. An intercultural mediator will help and tutors should be trained to detect the signs of anxiety.
Personality/identity/attitudes and motivation	Identity and language are in close rapport (chapter 3) and this should be assessed (measure of attitudes, etc.) which may be problematic in some cultural settings. What justifies the choice of distance is a very important factor and can explain variations in attitudes and motivation. As a consequence, at the beginning of the course, tutors will need to find ways of getting to know the learners as well as they can. Attitude questionnaires can help as well as specific on and offline tasks for getting to know each other and commenting the course. Motivation can be understood along more efficient lines (mastery vs. performance orientation, process-orientation and investment) Motivation is now seen as a phenomenon that engages the identity and the values of an individual. Motivating tools will be found in problem-solving or discovery approaches as well as in empowerment.
Language learning awareness	Nativization and socio-cognitive conditioning result in a need for metacognitive and metalinguistic reflection since explicit learning is assumed to facilitate the learning processes. Awareness raising activities should not be threatening and initial beliefs should be assessed as unobtrusively as possible. Questionnaires can prove useful, as can synchronous or asynchronous debates. Some specific tasks can be designed such as awareness raising and learner training activities and assigned at the beginning of the course, followed by a debate. Tools can be suggested to maintain and develop awareness, e.g. logbooks, forums, etc., or all tasks can be accompanied by a (short) self-assessment instrument. The learner will be led to create a more adequate learning environment and adapt his or her circumstances to the demands of this environment and will change his or her initial beliefs. Exchanges with the learners or between learners may indicate a need for environmental restructuring.
Autonomy	**Six indicators of autonomy can be defined:** 1. exploration of learning potentialities, 2. control of the learning process, 3. adequate use of learning routines, 4. management of constraints, 5. management of interdependence, 6. (epistemological) responsibility. Support tools are important elements. Needs analyses (pre-course interviews or tasks/tests) can help in order to see how ready learners are to cope with the demands of the course. Achievement depends on the learners in distance setting and learners need to become aware that they are key agents in the construction of the interface. Resistance may be countered by some form of learner training in the form of reflective interaction.

continued on the following page

Table 1. continued

Reflective interaction	Critical interaction will prove useful, it can help organize the course and foster affiliation. A fit between the new learning environment, the learners' own contexts and their attributes as individual learners should be ensured early in the course. The absence of real-time face-to-face interaction is central and will have to be compensated for. Synchronous tools increase a sense of social presence and group cohesion and may be more efficient than asynchronous tools. Misunderstandings are likely to occur more frequently than in other courses, due to an initial need for intercultural and/or interpersonal mediation. A fit between the performative identity and the personality of the learner is important: absence of fit, or mismanaged tensions, may result in ineffective interaction and learning.
Learner training	There are two basic approaches to learner training: 1. strategy development and learner training through materials design; 2. involving learners in choosing and accessing personally meaningful learning opportunities in the context of social interaction. No perfect fit can be expected between learners and what is expected of them but advising the learners will be easier if problems can be detected rapidly. Awareness raising activities will remain unobtrusive and non-threatening, and will take into account the personal and cultural sensitivity of each individual learner. Learner training also consists of specific L2 meta-reflection in order for the learners to understand what learning an L2 implies, and how this process will be affected by distance. Specific tasks can be suggested or included in more general tasks.

THE LEARNING CYCLE IN A DISTANCE ENVIRONMENT AND THE LEARNER

This chapter was devoted to the learner, but very few learners will actually read it and it is not sure that they would gain any benefit by reading it. We have seen that the learner will need to be sensitized to how the learning process will be organized in the specific environment he or she has selected. Our assumption is that the environment should be seen as an organizing circumstance in order for the learner to reach his or her objectives or the objectives that have been assigned to him or her, which will then impose some form of negotiation. The learner will realize that this approach is neither linear nor necessarily pre-organized and this may require some form of initial adjustment. Figure 1 shows how the learner is involved in the process.

Pre-course getting to know each other will deal with learner characteristics and identity, macro tasks (including interaction between learners) and tutor/learner sessions will provide reflective interaction, assessment of autonomy and the needs for learner training. Macro tasks can help solve some of the problems, but specific micro tasks can prove useful for individual problems (see chapter 11 for typology of tasks).

The learning cycle focuses on the learner and learning, and not on what is learnt or on a curriculum. What the learner experiences individually or collectively will gradually determine a progression that will be constantly adjusted along the lines of the proposed curriculum. We will see, in chapter 11, that the task-based approach will provide the necessary flexibility, and though we have stressed the opportunities provided by CMCL, such systems can be adapted in environments in which CMCL is not yet introduced (Fanou, 2009). As we have seen in this chapter, the learners will benefit from interactions with peers and the teacher, whose role will be very different from what it used to be in traditional settings but will remain a key element in the system.

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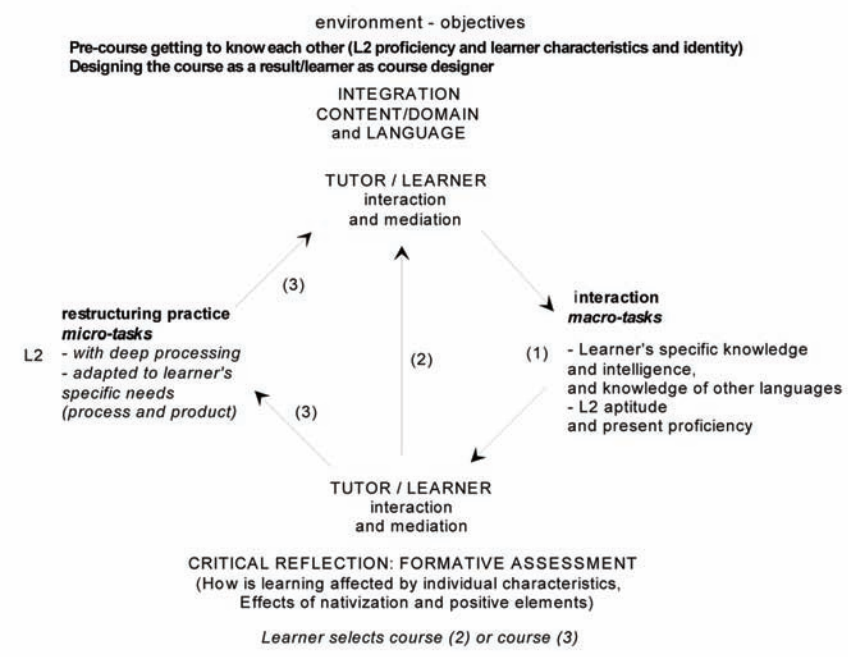
Figure 1. The learning cycle



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Chapter 6
The 'Teacher' Pole

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INTRODUCTION

The teacher is one of the poles of our model. As is often the case in complex systems, it is difficult to observe one of the poles in isolation, since there is constant interaction between them. Chapters on the language pole, the learner poles, as well as the reflection on the learning process have reduced our description of the teacher pole to what is directly relevant to the person.

OBJECTIVES OF THE CHAPTER

As in previous chapters, this chapter will address some general points that may be modified by distance such as:

- mediation,
- modes of delivery,
- constraints,
- roles and skills,
- monitoring,
- advisory strategies,
- knowledge of learners,
- postures,
- assessment of staff.

The reader can initially try and see how he or she would answer the questions and compare with what is described in the chapter. A synthetic table summarizing the content of the chapter will conclude the chapter, followed by a figure illustrating the place of the teacher in the cycle. Anticipating the figure and discussing how different the anticipation is from the position defended in the book may prove a worthwhile way of reading the following pages.

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TEACHING METHODOLOGIES AND PRACTICES

An individual's knowledge is described as a personal construction mediated by teachers or peers (chapter 3). Distance will not affect the individual's construction of knowledge, but may make mediation and social interaction more complex. Research in second language acquisition and the teaching and learning of languages has led to considerable theoretical discussion (Seidlhofer, 2003) and reflection on how it could enlighten classroom or other forms of instruction (Ellis, 2001).

Authors recurrently mention the gap between research and practice or pedagogy (Ellis, 1997, Richards & Nunan, 1990, Fotos & Nassaji, 2007, or Chapelle, 2003, among others). In distance second language learning environments, the teacher needs to be a reflective practitioner (Lamy & Hampel, 2007, p. 73), which requires training and discussing with mentors (Lamy & Hampel, 2007, p. 74).

Training is a formal and institutionalized process of preparation towards the achievement of pre-specified outcomes and the development of skills for predictable situations, whereas teacher education is more flexible in its formats and is seen as a life-long pursuit in order to be able to cope with new and unpredictable situations which require both a reformulation of beliefs and conceptions and the modification of established patterns (Richards & Nunan, 1990).

Ellis (1997) maintains that, initially, language teaching research has been method-driven and aimed at comparing the results of different language teaching methods. Subsequent research is now mainly conducted in order to test theoretical claims about second language acquisition processes. These claims have been described in the previous chapters. Although theory-based research is not directly concerned with pedagogical issues, authors have tried to describe effective L2 instruction based on its results (Bygate & al, 2001, Lightbown and Spada, 2006, among others). The application of research findings in everyday pedagogy increases the complexity of teacher training. Training is no longer a question of applying a number of finely circumscribed rules and performing the right move at the right time according to a teacher's book written specifically to go with the course material. The word training can no longer be used to refer to the more complex requirements of a profession that is constantly adapting to pedagogical and technological change, and this is particularly true of distance language learning.

THE TEACHER AS A MEDIATOR

The Case for Mediation

Previous chapters in this book have highlighted this concept which can operate in many forms. According to Lamy & Hampel (2007, p. 32), mediational tools include:

- the language humans use;
- cultural assumptions,
- social institutions;
- the software and the hardware available;
- the time structure of the course.

In face-to-face teaching, constant adaptation is required in the teacher's mediation. Such immediate adaptation will be more difficult to maintain at a distance, and even though flexibility can be implemented, the locus of mediation will change and the learning environment, the technology available, and the tasks will have to be explicitly designed to carry out some of the mediation required. Mediation will operate in varying degrees of networking in distance learning (Lamy & Hampel, 2007, p. 33) and this networking will have to be planned from the onset of the course.

Mediation at a Distance

How to Deal with Mediation at a Distance

As has just been described, more attention will be paid to proactive mediation by carefully anticipating problems and organizing ways of solving them (such as designing the environment, the tasks, selecting adequate tools, supplying support and preparing instructions). Mediation will also be reactive, in the form of feedback (synchronous or asynchronous) and adjustment. Feedback will be focused on process (how the learner works) rather than on product (quality of the output), since it is easier and more effective to advise a learner to do a series of specific micro tasks if necessary, than to make a list of 'errors', especially when the quantity of output and the number of participants do not make systematic 'correction' possible (see chapter 4). Peer interaction will provide some form of useful mediation (scaffolding, Rees, 2003) and will result from networking. As was shown in chapter 4, the environment and ICT provide tools (affordances) that will impact on mediation. Though not designed to be used as tools for mediation, they will be given that role by the learners and will thus complement what had been planned.

Modes

Lamy & Hampel (2007, p. 35) describe two camps: *those delivering high-quality language learning experiences and those of lesser status and quality for language learners less well resourced.* We would be tempted to think that these are the two ends of a continuum, but that what matters most is the theoretical validity of the language learning experiences that are delivered. Grosbois's findings (2006) highlight the fact that apparently solidly constructed courses may have points that are theoretically weak and therefore counterproductive. Reflective practice in the form of action research will help detect the effects on learning of these, at generally no great cost, and the necessary adjustments can be made.

White (2003, p. 77) describes the concept of access (the greater the access, the more complex teacher/learner relationships may become). However, flexible environments offering great access will provide unpredicted affordances if the networking has been well planned and this will provide other forms of mediation that can also be assessed by action research.

Initially, computers offered one mode only: written language, now they bring together a number of modes (Lamy and Hampel, 2007, p. 37) which allow greater interactivity and a multiplicity of ways of accessing meaning. This also increases the need for CMCL literacy and for constant retraining of teachers.

Constraints for Teachers

Being a teacher in distance courses comes with a number of constraints (White, 2003, p. 73). Such courses require greater planning and development complexity, the need to understand the learners, their background, educational culture, goals and needs. Running them is time-consuming, since person-to-person communication is not spontaneous and takes longer while isolated learners expect permanent availability of their tutor. Feedback is more complex. However computers can offer ways of reducing the teacher's workload if careful thought is given to monitoring as will be seen below. Teachers can also share the work in very different ways.

EVOLVING TEACHER ROLES

Role(s) of the Teacher

The teacher is no longer seen as a Jack of all trades, his or her functions have been defined and can be performed by different people according

to their preferences and/or training and education (Pothier, 2003). Teachers can be course designers, materials designers, tutors, interlocutors, etc. (Narcy-Combes, 2005). Distance language learning environments will necessitate team work and other specialists will be part of the team, which implies a capacity for team work and for cooperating with different types of personnel (see chapter 11). White (2003, p.81) suggests that '*production and delivery of courses should not be separated from other teaching functions'* in order to ensure greater coherence in the course. In this section we will not separate the functions.

As in self-directed learning, tutors, singly or in a team, and in collaboration with the learners, will be in charge of (adapted from Demaizière, 2003 and White, 2003):

- selecting course content and methodology in relation to the curriculum and objectives;
- selecting when and how to intervene (proactively or reactively)
- deciding the nature of content (linear, flexible, fluid, provided by learner);
- managing the resources;
- selecting learning experiences that enhance confidence and expand learning options (discovery approaches, problem-solving activities, TBLT, collaborative work, etc.);
- providing supportive feedback (constructive judgements and evaluations);
- encouraging risk-taking and opportunities for learners to communicate about learning with others;
- facilitating group bonding, in order 'to increase interaction and peer mediation;
- ensuring that learning is meaningful, socially based and coherent with the expected outcomes;
- suggesting further activities.

Skills for Online Tutors

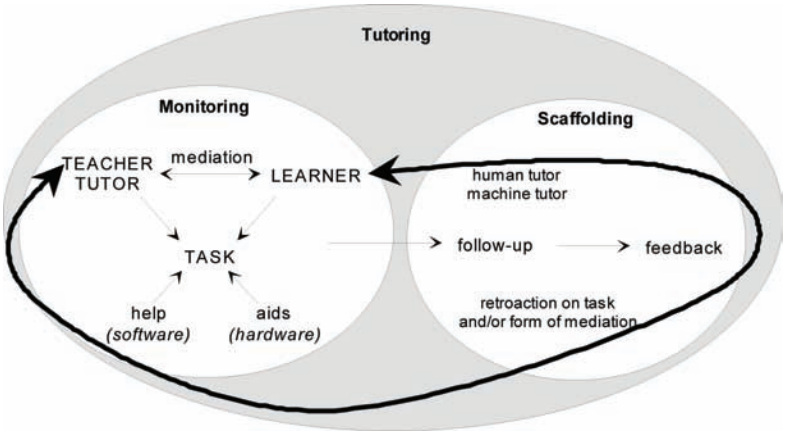
Carrying out all these tasks require a number of competencies that are described in White (2003, p. 69). Tutors will be expected to:

- *adjust their practice to distance language learning environments;*
- *counsel learners in their adaptation to distance;*
- *identify the characteristics and needs of language learners at a distance;*
- *provide ongoing support for learners in new and unfamiliar learning environments;*
- *monitor individual learners and the course;*
- *respond to a new and different range of issues and affective states in relationships with learners;*
- *provide motivating support and tasks at a distance;*
- *support students at a distance and help them to become responsible for their learning;*
- *work as part of a team, with technology experts, learning support staff, etc.;*
- *understand the advantages and disadvantages of new language learning environments, and develop appropriate strategies and relevant responses;*
- *operate in a context of ongoing change and innovation.*

As a consequence (Lamy & Hampel, 2007, p. 62), tutors will have to become confident in the use of online tools and to be able to adapt their teaching style to suit often rapid and unexpected changes in the learning environments. Managing their multiple roles within online environments and coping with learner demands for individualized feedback requires flexibility and may initially go against their posture as a teacher (see below).

Face-to-face teaching may pose fewer problems, but very similar skills are expected from

Figure 1. Monitoring and related concepts



the tutor in self-directed learning (Esch, 2001). There will be fewer ready-made responses in distance learning contexts as learner responses will not be so easy to predict. Institutional follow up may not always be appropriate according to White (2003, p.70), but this is not a specificity of distance learning.

This amount of work may be felt as a deterrent for prospective tutors. However, some form of support can be implemented in the way in which a learner is monitored in order to alleviate the burden.

Monitoring in Technology-Mediated Environments

Technology-mediated environments can provide learners with tasks in which the computer can monitor the work (micro tasks, in particular).

Figure 1 is an illustration of the various semantic fields we see in relation to monitoring (Bertin & Narcy-Combes, 2007).

We have defined mediation as the process of interaction between the tutor (whether it is human or machine) and the learner. In distance learning, this process is necessary in order to make sure that the learning aids and help provided in the environment are really effective.

Help refers to what the learner may need in order to perform what is required of him or her: this may be at the operational level (how to use...?) or at the methodological level (e.g. advice). If a comparison is made with technological terminology, help can be seen as software.

Learning aids, on the other hand, can be associated with hardware and correspond to the devices that the learner might need for his/her own learning: they are related to the cognitive level.

To facilitate the mediation process, technology-mediated environments may offer the possibility of tracking learner activity, which constitutes the field of monitoring.

Follow-up is defined as the way in which the tutor analyses what has been tracked and derives plans for what will follow, while feedback corresponds to the tutor's response to learner activity.

Finally, scaffolding in this case can be seen as the retroactive process of adapting the response either to the learner (through human or machine action) or to the teacher in order to adapt the task and/or the form of mediation to the level of learner competence observed in completing the task.

Tutoring would include all the previous elements and refer to the actualisation of mediation and evaluation.

This set of definitions points to the fact that monitoring should not be perceived as an end in itself, but should rather be understood as a means to achieve an end. It is one of the sources of information, a technological one, available to the participants in the learning situation for observing and evaluating paths and achievements. It is therefore inseparable from evaluation. Other sources might include the face-to-face relationship between the participants, including peers, for instance.

Monitoring is one form of the virtual presence of the teacher: it makes it possible for the teacher and/or learner to be better informed in order to provide some sort of individualized tutoring/ guidance. Its function, together with tutoring, is therefore both pedagogic and psychological, as the learner no longer feels isolated in the virtual world but is involved in a human relationship, even if the latter is mediated by a computer. Such an approach to tutoring may increase the effectiveness of micro tasks and virtual resource centres. It clearly would prove more difficult to implement in the more interactive macro tasks, though some form of monitoring might reduce the workload of the tutor in terms of feedback and guidance to decide what further (and more cognitive) work needs to be carried out.

Strategies Used in Learner Advisory Sessions

The literature of self-directed learning offers useful suggestions (Duda, 2001, Holec 1998, etc.), the major difference lies in the setting and the difficulty of organizing actual face-to-face sessions (White, 2003).

The tutor can proceed as a counsellor who listens to, or reads in some cases, what the learners have to say concerning the ways they look at their work, progress and problems. The tutor can ask questions (in order to elicit or probe what has been said, or to pass the learners' questions back to them). Other strategies imply reformulating, asking for clarification, summarising, checking comprehension, and highlighting contradictions. What matters most is to reduce interference and direct questions (Narcy-Combes, 2005).

Advising will come as a response to what has been heard or read. It is best to formulate advice in the form of questions in order to let learners express their needs, focus their goals, and identify their methodological or organizational problems. According to their answers, learners can then be reminded of their initial goal/plan, offered suggestions, and given feedback. Tutors can explain features of L2, or why some points are problematic, but suggesting individual discovery will prove as effective if the resources are available.

Learners will be reassured if their progress or performance is assessed. They need some form of encouragement (such as positive reinforcement, understanding of their difficulties or comparisons with experiences of other learners).

According to Demaizière (2003), in such sessions the tutor should:

- avoid uniformity and repetition;
- avoid contradictory advice or feedback;
- avoid authoritative guidance;
- interfere appropriately (neither too early nor too late);
- manage time and priorities;
- make sure learners do not feel isolated;
- avoid unrealistic expectations;
- take contextual/environmental parameters into account (without expecting outcomes that the context cannot provide).

This can only be achieved if teachers know who the learners are and how the course is going to affect them.

Knowledge of Learners

Before the course, it is useful to plan the course, permit the teachers to speak to the learners through the course materials, plan support services and

counsel learners in course selection and planning (White, 2003, p. 110).

When the course begins, learners will be informed of the support available. A class profile will be established for all participants and not simply a list. Exchange of student experience and interaction will be included in the environment. Some form of adaptation to each learner will be made possible.

During the course, we have seen that learner responses must be monitored. The feeling of isolation must be reduced by opportunities for interaction with other learners and tutors. Learners will be kept aware of new support as it becomes available and feedback on assignments will be individualized. Tutoring sessions have been shown to provide personal feedback from learners as they reflect on their progress. These sessions will uncover personal needs and difficulties, and show how the learners adjust to the course and how their beliefs and expectations evolve. Some form of midway anonymous assessment of the course can prove useful, closed attitude questionnaires may be more appropriate than open-ended questions since they will be more accessible to learners from all cultures. Midway questionnaires give the learner a sense of being taken seriously into account (Narcy-Combes, 2005) as they feel their responses may still influence the course of events.

Tutors in distance second language learning seem to be under a great amount of pressure, and yet in Hampel and Stickler's pyramid of skills (2005, p. 315), the top skill is developing one's own style in order to feel comfortable and therefore more efficient as well.

TEACHERS' POSTURES AND DISTANCE

Style is the way an individual responds to a given situation, it can be connected with the concept of multiple identity (Lahire, 2003, see chapter 3). Style may result from the interplay of an original posture related to the individual's deep motivation and the way he or she has been conditioned or educated to behave in that situation (Bandura, 1986, see chapter 4). Teacher styles have been studied (Cook, 2001, or Altet, 1994, and Puren, 2004), but understanding of styles is improved by a reflection on postures.

Teachers' Postures

Table 1 has been drawn from research results by Dubet and Martucelli (1996) and completed by descriptions from Linard (1989). Posture is to be seen as a dominant way of apprehending events, largely conditioned, which may result in an actual physical way of behaving. Table 1 in chapter 4 is schematic in the sense that human beings often have complex postures. However, personalities that have a clear-cut posture may be less adaptable than others and team work is facilitated by adaptability.

The basic postures described here do not really depend on cultural parameters, they can be exemplified in most cultures. However, some educational cultures will favour some postures more than others. Style can be seen as the adaptation of a posture to a specific socio-cultural environment by a given person. Such an adaptation is positive when the person feels rewarded by the result. Frustration may be the sign that individuals are not comfortable with their styles and they need to examine why.

As far as distance second language learning is concerned, Lamy and Goodfellow (1999, p. 476) identified the most advantageous approach as a combination of the tutorial styles of both the social and the cognitive tutor. Various adaptations of postures B, C and D may be conducive to such a combination depending on how flexible the posture remains.

In agreement with Rogers (1969), White (2003, p. 116-8) underlines that tutor styles should include empathy, affective strategy use and a dynamic

Table 1. Teacher postures

Deep motivation	Posture	Consequences	Language teaching options
Narcissism	A. Transmission of knowledge	Expects the learner to mirror his or her own qualities.	Linear content, Mastery orientation, Demanding objectives. Transmissive approach.
Need for power /security	B. Organizing and directing role	Expects learners to need rules and pre-defined programs.	Linear content, Mastery orientation, Planned and centralized systems. Cognitive approach.
Need for socio-affective recognition	C. Facilitative role	Tutored self-directed learning Learning to learn	Learner support, A measure of learner empowerment, A limited form of planning, Socio-cognitive/ cultural approach.
Counter-dependence	D. Refusal to teach	Total authenticity Total autonomy	Flexible environments, No planned content, Learner as course designer, Learner collects own materials. Sociocultural approach/no approach.
Other postures may exist, and postures may not be so rigid			

conception of language learners. Tutors that are comfortable in their styles will display these skills, but some rigid monolithic postures (especially A and B types) will not be facilitative.

Origins of Postures

Research results (Barbot et Camatarri, 1999) indicate that postures result from a slow construction and are due to a multiplicity of factors, which include:

- Individual, personal and cultural conditioning and degree of ethnocentricity;
- training and education (including degree of openness to new ideas and systems)
- status (professional and social);
- values;
- tastes;
- motives;
- goals;
- fears;
- resources;
- constraints.

Some of these factors are directly accessible and others may remain largely unconscious (Channouf, 2004), access to them having to be mediated. Depending on how rigid the posture is, team discussions will or will not lead to adjustment.

Consequences

Postures and self-esteem are closely related, and some educational environments will be more prepared than others to take advantage of a multiplicity of postures in a team.

In a project that brought together 150 teachers in some 50 different high schools in France, research has shown that over a period of 8 years (Narcy & Biesse, 2003), the teachers involved in each school project have experienced difficulties in team work and in referring to different educational backgrounds. Their initial training had been

consistent, research-based and interculturally oriented, which did not prevent two characteristics of the French educational culture (an individualistic approach without any tradition of team work, and a form of educational ethnocentricity) from triggering some resistance. This required some form of mediation from the organizing team as the teachers involved were not in a position to see what was not going as well as they had planned.

Distance in creating very new environments and learning conditions may be destabilizing for a number of teachers who need to find adequate and non-judgmental support in order to adjust.

Assessment for Staff

Tutors and the environment will have to be assessed. Learner assessment will be balanced by peer assessment among tutors. Team work has been shown to be of paramount importance (see above) and it will be assessed. Some form of mentoring will be implemented, especially in the case new tutors (Lamy & Hampel, p. 97).

White (2003, p. 74) draws a list of quality criteria for peer assessment of team work:

- *learner support;*
- *level and amount of engagement in the course;*
- *ongoing evaluation over the duration of the program;*
- *content, structure and context of provision;*
- *the use made of media;*
- *the teaching approach;*
- *the management of provision;*
- *contact opportunities;*
- *feedback options;*
- *quality of services and resources.*

These criteria will be applied in reference to the learning theories the course is based on.

SYNTHESIS

Table 2 sums up the content of the chapter. Contrary to commonly held beliefs, distance does not reduce the workload of the teacher, nor does it make it possible to do without teachers.

As we have seen teachers, can have many different roles in distance settings and their place in the cycle may vary according to which role they have to perform.

THE TEACHER IN THE CYCLE

As was done with the learning process and the learner, we will now see the position of the teacher in the cycle (Figure 2).

The functions of the teacher are numerous and varied. Flexibility, creativity and a personal relationship with the learners are likely to make distance teaching a rewarding activity, if the complexity of some of the functions can be reduced. Organizing can be the charge of a person who will not be a tutor in the course, the tasks (micro as well as macro) may not have been designed by the course tutors, if they have, the tutors should be familiar with them. As a consequence, proactive mediation, which will take place before the course, may not involve course tutors, which would be regrettable. Reactive mediation will result from interaction between the tutor and learners in on or offline advisory sessions. Reactive mediation is clearly a more adequate "organizing circumstance" than proactive mediation (see chapter 5), if course tutors then have the power to adjust what needs adjusting in the course. Some form of initial 'planning' will however have a comforting effect if adjustments are possible, learners and tutors would be surprised if nothing had been planned.

The blocks to the right and to the left show the extent of the help that technologically-mediated monitoring can give. When this is totally available,

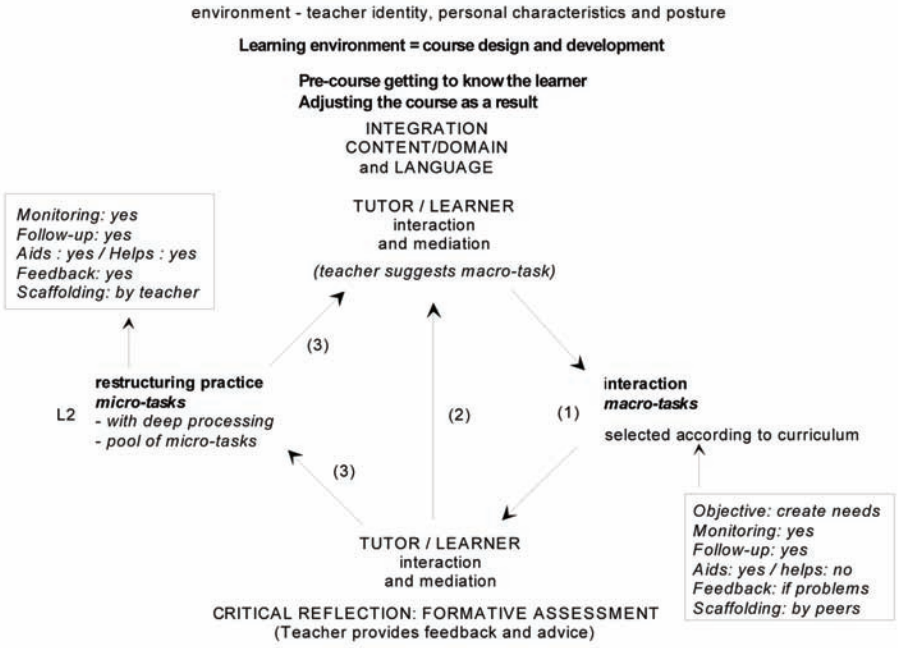
Table 2. Synthesis of chapter 6

Mediation	Proactive mediation will be paid attention to by carefully anticipating problems and organizing ways of solving them. Reactive mediation will take the form of feedback (synchronous or asynchronous) and adjustment. Feedback will be focused on process rather than on product. Peer interaction will provide some form of useful mediation and will result from networking. The environment and ICT provide tools (affordances) that will have an impact on mediation.
modes	What matters most is the theoretical validity of the language learning experiences that are delivered. Reflective practice in the form of action research will help assess this. Access and modes become more complex and more varied. This provides more unpredicted affordances and greater interactivity and a multiplicity of ways of accessing meaning while increasing the need for CMCL literacy and for constant re-training of the teachers.
constraints	Distance courses require greater planning and development complexity. Running them is time-consuming. Feedback is more complex. Computers and team work can help.
Roles	Teachers can be course designers, materials designers, tutors, interlocutors, etc. (Narcy-Combes, 2005). Distance language learning environments will necessitate team work and specialists of other fields will be part of the team. Tutoring in distance settings is not very different from tutoring in self-directed learning environments.
Skills	Carrying out all these tasks requires a number of competencies that require flexibility, empathy, and a capacity for team work. Tutors will have to become confident in the use of online tools and to be able to adapt their teaching style to suit often rapid and unexpected changes in the learning environments. This may initially go against their posture as teacher. Ready-made responses in distance learning contexts will not be the rule.
Monitoring	Technology-mediated environments can provide learners with tasks in which the computer can monitor the work (micro tasks, in particular). Monitoring is one form of the virtual presence of the teacher: it makes it possible for the teacher and/or learner to be better informed in order to provide some sort of individualized tutoring/guidance.
Strategies used in learner advisory sessions	The tutor proceeds as a counsellor who listens to, or reads in some cases, what the learners have to say. The tutor can ask questions (in order to elicit or probe what has been said, or to pass the learners questions back to them). Other strategies imply reformulating, asking for clarification, summarising, checking comprehension, and highlighting contradictions. Interference and direct questions should be limited. Advising is a response to what has been heard or read. Advice will be in the form of questions in order to reduce interference. Learners need some form of encouragement.
Knowledge of learners	Pre-course work is necessary in order to get to know the learners. Learners will be informed of the support available. A class profile will be established for all participants and exchange of student experience and interaction will be included in the environment. Adaptation to each learner will be made possible. Learner responses will be monitored. The feeling of isolation must be reduced by opportunities for interaction with other learners and tutors. Learners will be updated on new support and feedback on assignments will be individualized. Tutoring sessions will provide individual feedback. Learner assessment of course will be beneficial if it comes early.
Postures	Style may result from the interplay of an original posture related to the individual's deep motivation and the way he or she has been conditioned or educated to behave in a given situation. Posture is to be seen as a dominant way of apprehending events, largely conditioned, which may result in an actual physical way of behaving. Tutor styles should include empathy, affective strategy use and a dynamic conception of language learners. Tutors that are comfortable in their styles will display these skills, but some rigid monolithic postures will not be facilitative. Depending on how rigid the posture is, team discussions will or will not lead to adjustment. Distance in creating very new environments and learning conditions may be destabilizing for a number of teachers who need to find adequate and non-judgmental support in order to adjust.
Assessment for staff	Tutors and the environment will have to be assessed. Learner assessment will be balanced by peer assessment among tutors. Team work has been shown to be of paramount importance (see above) and it will be assessed. Some form of mentoring will be implemented, especially in the case new tutors.

micro tasks will fulfill their role more adequately and the teacher will be in a better position to advise the learner.

Let us remember that some postures (see Table 1 in chapter 4) may result in too much control being implemented. The learner should always be

Figure 2. The learning cycle



able to negotiate the amount of monitoring he or she feels is needed and personally acceptable. As facilitators, tutors will have to accept the limitation of their capacity to influence, but this has been the case in all forms of teaching.

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Chapter 7
The 'Technology' Pole

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INTRODUCTION

This chapter will try to answer the following questions:

- What trends have influenced the relationships between technology and education?
- Is 'technology' a unified concept?
- How can technology improve language learning?
- What functions can be attributed to technology?
- How do language learners and teachers perceive technology?

Whether new or old, technologies are a recurring issue in the practice of university teachers and researchers. While they form an integral part of everyday life, they are considered as specific objects in the field of research and teaching. Although they are prized for their instrumental functions, their epistemic dimension remains largely ignored. Resorting to a technical device to optimize a research or a teaching activity or make it more comfortable seems operational; pondering over what this technical device modifies in the organization of the message and the tasks, as well as in the subject (teacher and learner)'s representations is often regarded a waste of time and efficiency. The energetic and material cost is then considered too high for the individual and the collectivity. Yet, if one easily disregards the changes brought about by the introduction of an artifact in educational interactions, the risk is high simply to reproduce the same thing indefinitely: a technically improved pedagogic model – sometimes at a high cost – but basically still the same[1]*. (Albero, 2004, pp. 253-54)*

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Albero's reference to the academic context of universities, which can easily be enlarged to distance learning as a whole, is a clear reminder of the 'analyzer' function of technology and distance (chapter 2).

What this chapter will show, however, is the difficulty to provide an appropriate and comprehensive definition of the 'technology' pole of our model for a variety of reasons, both historical and pragmatic. To form a clear idea of our ergonomic model of distance language learning, we need to be able to recognize which, among the various forms and uses of technology, can actually be accepted as an added-value to the learning process. Another way of asking the question is: in what ways can computer technologies offer better answers to language learning than the previous ones?

Computer technology can be characterized by three main innovating features of interest for language learning:

- The **digital** nature of the data, which offers a technical solution to the ergonomic problems raised by the former technologies: portability, flexibility, absence of linearity in the access to information, all of these combining to provide a new environment for distance learning.
- The **interactive** nature of the computer, i.e. its capacity to 'respond' to its user's solicitations, to 'analyze' his reactions and 'suggest' possible solutions while at the time keeping track of the learner's progress. The anthropomorphic nature of these actions suggest the presence of 'virtual actors' in the new learning spaces (tutors, peers…).
- The **communicative** dimension stemming from the development of networks and more especially of the Internet, which abolishes, or at least partially hides, geographical distance (chapter 2).

For all their rich pedagogic potential, these technological innovations must be checked to avoid falling into the technocentric temptation. The most recent breakthroughs in no way invalidate S. Savignon's warning:

A teacher's dream: teachers dream of finding the ideal materials; materials that are at once very accurate and imaginative, that offer both sequence and flexibility and that provide variety yet respond to well-defined instructional goals. (…) The search for materials leads, ultimately, to the realization that there is no such thing as an ideal textbook. Materials are but a starting point. Teachers are the ones that make the materials work for their students and for themselves in the context in which they teach. (Savignon, 1983, pp. 137-8)

This vision is all the more transferable to our context as our initial distinction between learning environment and (virtual) learning space forms an integrative and comprehensive approach (Figure 20 in chapter 1) which takes into account the variety of learning materials and aids.

The issues affecting the technology pole, then, concern the ways to reconcile technical characteristics with didactic concepts: how to move from digital flexibility to individualization and distance learning? How to generate cognitive interaction through interactivity? How to engage the learners in authentic communication through networking?

In order to examine the various possible approaches to these questions, and before considering the problems involved in the definition of this pole, we will first analyze the type of relationships that language learning and technology have long entertained.

TECHNOLOGY AND EDUCATION: EVOLVING RELATIONSHIPS

The history of societies is marked by technological breakthroughs which characterize social institutions. Innovation indeed is the challenging

force (*l'instituant*) which drives evolution and brings about new forms of social organization (*l'institutionnalisation*) – see chapter 2. At the same time technological innovation is linked with utopias which convey a great potential for change. The history of educational technology is in line with this logic. Two great and interconnected major changes took place in the second part of the 20th century: the computer revolution, followed by the rapid expansion of networks and of the Internet. Their connection with the world of education reflects complex relationships, influenced by the main currents of thought on which language learning situations rest. A rapid review of their effects will help us form a clearer idea of technological integration.

Systemics in Education

Chapter 1 presented the main principles of the general theory of systems. Their application to the ergonomic approach to distance language learning consists in identifying the nature of the relationships between the general system's components, the sub-systems and their final goal (language learning). Works by Stolovitch & Laroque (1983), Gagné (1988), Dick & Carey (1990), or again Lapointe (1991) clearly show that the principles of systemics are present in the process of pedagogic design. Several main phases can be identified.

In the first stage, the teacher plans the teaching process by identifying and classifying objectives before determining the necessary elements and means of action (group work, tests, documents of various types – written, audio and computer-based) in relation to his/her initial objectives.

In the second stage, he/she collects the necessary data to identify the audience: learners' characteristics, cognitive profiles, levels of competence/proficiency in the language, motivations… Analysis of the data may lead to a revision of the teacher's objectives.

The third stage considers the ways to implement the pedagogic strategy in the specific context: this is the actual design phase of the learning environment, including control, evaluation and feedback dimensions.

In a systemic perspective, the question is to determine the function technology can fulfill at each of these stages. Two main orientations can be distinguished:

- how can technology assist administration and management tasks (including materials and tasks design)?
- how can technology assist the language learning process (including monitoring and follow-up functions)?

Interactions with Second-Language Acquisition Theories

While behaviorist theories mainly influenced initial developments in 'Programmed Learning' (see later pages), cognitive, constructivist and sociocultural theories found new ground for development when the computer became an object of research, owing to its pedagogical potential. What became known as 'open environments' (i.e. uncontrolled or partially controlled) radically changed the didactic approach to the technology. More consideration could be taken of cybernetics (theoretical approach to communication in Human-Machine systems) and the new paradigm became the integration within materials and environment design of what Bergeron & Bordier (1990) called *the unforeseeable nature of student behavior*.

To meet these expectations, the status of the computer must be revisited and become just one more component of a global environment requiring:

- a valid representation of language;
- an acceptable representation of learning and acquisition processes;

- an interactive pedagogic module;
- a user-interface.

Such developments are characteristic of the interactive and open-environment era in which research more readily focuses on such objects as open interactivity (and the related concept of interaction), knowledge representation techniques (hypertext, hypermedia…), language appropriation methods for learners (heuristic browsing…) and pedagogic guidance (tutoring and monitoring). More recent experiments aim at combining several influences into new generations of language learning multidimensional environments: systemics (open and interactive environments), artificial intelligence and multi-agent systems (assistance to decision-making processes for tutoring), constructivist theories (engaging the learners more actively in their own learning), cognitive theories (resorting to psychology and ergonomics to identify cognitive interactions within the environment), sociocultural theories (development of collaborative platforms).

The common feature of all these developments seems to be the attention paid to placing the human element at the center of the environment and to resist social as well as commercial pressure overemphasizing the function of technology.

Teaching Methodologies and Technology: The Myth of the "Teaching Machine"

The myth of a machine that would take learning in charge to the benefit of learners, teachers and institutions can be traced back to WWII, when it became necessary to train spies rapidly and efficiently so that they could become 'linguistically invisible' in the foreign populations in which they were immersed. Mastery of the local language became an essential stake and the search for tools that could meet this challenge was launched. The technological Grail found its representation in…

> *…a teaching machine which could be programmed in such a way that the student can learn more in less time and with less effort than through conventional classroom teaching. (Stern, 1983, p. 306)*

This trend developed into the post-war years thanks to the concurrence of the behaviorist theories of the time, a linguistic perspective influenced by structuralism and the development of tape recorders. This coincidence led to the appearance of the so-called 'language laboratories'. Behaviorist theories later found an almost ideal tool with the emerging computers: the new machines were an improvement over the language laboratory insofar as they could reproduce 'stimulus-response-reinforcement' sequences while at the same time offering some kind of individualization (learners could work at their own pace) and immediate feedback. This 'Programmed Learning' was however rapidly exposed to the subsequent criticism of its behaviorist background as well as of the purely linear (Skinnerian model) or branching (but still linear in essence for Crowderian models) algorithms of learning on which it was based. This audio-oral/audio-lingual methodology of the 1950-60s was superseded a decade later by the structuro-global/audio-visual methodology emphasizing language in context. The more portable tape-recorders of the period, enabling learners to listen to pre-recorded elements of language, were naturally complemented by the slide projector whose function was to suggest context visually. The communicative approach which followed from the 1970-80s, relying on sociolinguistics and pragmatics, focused on authentic discourse: this found a new support in the form of television and video-recorders. While these technologies provided appropriate input to the language class, they suffered from an absence of interactivity and a lack of flexibility. The advent of personal computers in the late 1980s seemed to provide the expected universal answer as they offered the 'always-hoped-for-never-reached' opportunity to bring individualized and authentic interaction into

the language classroom. It was felt by many as a revolution and consequent expectations were so high that the limits of the first generations of computers, coupled with the absence of formal and systematic training of teachers, generated dramatic disillusion and defiance in a large part of the educational community.

The more recent action-oriented perspective advocated by the European Council for Languages is characterized by its focus on language in use in authentic collaborative tasks. Simultaneously, computer technology has evolved at a very fast pace and now provides multimedia facilities, enriched interaction through hypertext/hypermedia as well as a large potential for distance learning with the development of the Internet.

The question remains to know if this profusion of technical concepts actually meets the needs of teachers and didacticians. If technologies have shown a linear progress, from separate monomedia devices to integrated and interconnected multimedia computers, the nature of their relationships to the field of pedagogy radically changed with the advent of the computer. Indeed, integration in the language learning situation of tape or video recorders, of projectors and television was a 'natural' process insofar as the original functions of these artifacts did not need to be modified or adapted for classroom use: recording and playing authentic discourse, showing visual aids, original films or TV reports represent as many activities for which these technologies are perfectly suited.

The case of the computer marks a significant break in this logic: the original functions of the artifact could not as such be of much help to the language teacher and only some of its associated concepts (interactivity …) could present some interest for the educational field. In an ergonomic perspective, no direct equation can be presupposed between the artifact and the potential cognitive instrument.

Is its attractiveness for designers and teachers due to the innovation its represents or because it provides new answers? The danger is high indeed to yield to the temptation of the technocentric approach. The prestige linked to technical innovation, or a utilitarian conception of multimedia materials may generate significant pressure on teachers and institutions. Conversely, an anthropotechnological approach implies that the pedagogic functions of the computer should be negotiated between the didactician and the computer expert.

This rapid historical overview also reveals a clear evolution in the integration of the technology in language learning contexts, from machine-centered to learning- or process-centered materials and environments. The machine-centered perspective is commonly associated with the first generations of CALL materials but is still visible in a number of more recent developments. It can be described as the attempt to automate monitoring and evaluation tasks. In a way, the computer replaces the teacher at the language laboratory console. This initial technocentric trend can be explained by the desire to integrate modern technology without investigating the depth of its potential and reproduces in its own specific way the development of the language laboratory:

The introduction of the language laboratory was undertaken with virtually no systematic research on its engineering aspects. The teaching methodology was developed ad hoc and what research was done was after the event. (Stern, 1983, p. 64)

The learning-centered perspective is more in keeping with the anthropotechnological approach we advocate: it tends to relegate the computer in its original function of information and communication management (management of knowledge representation, of the flows of information in the various sub-systems in the model, of communication in all its possible forms…). In this light, technical constraints are shared between the teacher/designer and the computer technician/researcher: developments essentially depend on the quality and the creativity of this dialogue.

What is at stake is manifold:

- Improve the learning process for the learner (*...a definition of CALL that accommodates its changing nature is 'any process in which a learner uses a computer and, as a result, improves his or her language"* (Beatty, 2003: 7).
- Improve learning conditions (Hubbard, 2009, p. 2).
- Improve 'teacher productivity' (Hubbard, 2009, p. 2). This notion must in our opinion be understood essentially in its humanistic sense, as the present authors do not believe that 'economic' productivity can be directly measured nor that it should be an acceptable criterion.

DEFINING A 'TECHNOLOGY' POLE FOR THE MODEL?

The 'technology' pole occupies an original place in our model for at least three main reasons:

- it is the instrument by which the learning process is supposed to be facilitated;
- it modifies the conditions in which existing relationships take place between language, learner and teacher;
- whether it is represented as technological mediation or as mediation by distance, it constitutes the 'challenging force' (*l'instituant*) which reveals unspecified elements of the traditional language learning situation (chapter 2).

Understanding the evolution of the relationships operating within a system supposes that the observer can identify the nature of each variable precisely: in the preceding chapters, we have been able to survey the various theories available for each pole before specifying our theoretical stance. Describing the nature of technology and providing a reliable representation of its capacity to impact language learning, however, proves to be problematic for a number of reasons. As a matter of fact, what exactly does the term 'technology' refer to?

The first possible answer might be the various technical forms in which the concept of technology is embodied: hardware (i.e. computers, cd-roms, networks…), software (the various types of applications developed for generic or specific purposes), language learning materials, environments and spaces. All these determine the final uses expected by the teacher/designer and hence the type of interactions generated in the learner-centered subsystem (Figure 17 in chapter 1).

'Technology' may also describe the multiplicity of pedagogic applications in the language learning context: information search, task work, webquests, specific activities ('exercises'), tutorials, collaborative work… Distinction should however be made between learning modality (computer-mediated classwork, pair work, collaborative or cooperative work, (a)synchronous learning …) and medium (face-to-face learning, blended learning, distance learning). Even when we restrict our observation to the specific field of distance language learning, distinctions must be made between stand-alone and add-on types of materials. In the former case, learning is meant to take place essentially on a distance basis whereas in the latter, various modes of learning are combined (Hotte & Leroux 2003, p. 2).

- Stand-alone courses/activities *strive to operate as virtual classrooms, in which the technology acts both as a tutor and a tool.*
- Add-on activities to classroom teaching or distance education courses: *the technology is used primarily as a tool and a communication device* (Felix, 2003, p. 8).

The difficulty to give a unified and coherent definition of the 'technology' pole can be illustrated by referring to Table 1, listing the various

Table 1. Facets of technology in the research literature

ICT and language learning	(Chambers, Conacher & Littlemore, 2004) (Buckland, 2000); (Atkinson, 2001); (Chambers & Davies, 2001); (Leask, 2001); (Barr, 2004)
Generic software	(Murray & Hourigan, 2006); (Corbeil, 2007)
Spell checkers / grammar checkers	(Vandevener, 2001); (Rimrott & Heift, 2005); (Burston, 2008)
Electronic glossing	(Hew & Ohki, 2001, 2004); (Coll, 2002); (Jones, 2003, 2006, 2009); (Deridder, 2003); (Ueh & Wang, 2003); (Ariew & Ercetin, 2004); (Taylor, 2006); (Al-Seghayer, 2007); (Abraham, 2008); (Farhan & AbuSeileek, 2008); (Lenders, 2008)
Data-driven learning	(Batstone, 2002); (Fuentes, 2004); (Chen, Tokuda & Hou, 2005); (Dodigovic, 2005a); (Johns, Hsingchin & Lixun, 2008); (Boulton, 2009); (Breyer, 2009); (Pérez-Paredes & Alcaraz-Calero, 2009)
Concordancing tools	(Chan & Liou, 2005); (Sun, 2007); (Yeh, Liou & Li, 2007); (Varley, 2009)
Machine translation	(Niño, 2009)
Video	(Herron, Dubreil, Cole & Corrie, 2000) ; (Bush, 2000); (Burston, 2005); (Hardison, 2005)
Internet/Web	(Lafford & Lafford, 1997); (Warschauer, Shetzer & Foster, 2000); (Dudeney, 2000 & 2007); (Windeatt, Hardisty & Eastment, 2000); (Barker, 2001); (Jarvis, 2001); (McBride, 2002); (Murray & McPherson, 2003, 2004); (Romeo, 2008); (Shei, 2008)
Distance / hybrid / blended learning	(Arens, 1998); (Swaffar, Romano, Markley & Arens, 1998); (Warschauer, 1998); (Felix, 2001, 2003); (Almeida d'Eça & Gonzalez, 2006); (Banados, 2006); (Scida & Saury, 2006); (Goertler & Winke, 2008)
Email	(Townshend, 1997); (Fischer, 1998); (Biesenbach-Lucas, Meloni & Weasenforth, 2000); (Leahy, 2001); (Liaw & Johnson, 2001); (Stockwell & Levy, 2001); (Appel & Mullen, 2002); (Stockwell, 2003); (Stockwell & Harrington, 2003); (Weber & Abel, 2003); (Smith & Barber, 2005); (Vinagre, 2005)
Conferencing / Telecollaboration	(Biesenbach-Lucas & Weasenforth, 2002); (Hampel, 2003); (Hampel . & Baber, 2003); (Rosell-Aguilar, 2005); (O'Dowd, 2006); (Darhower, 2007); (Wang, 2007); (Hauck & Youngs, 2008); (O'Dowd & Walre, 2009)
Chatrooms	(Böhlke, 2003); (Oskoz, 2005); (Sanders, 2006); (Jenks, 2009); (Loewen & Reissner, 2009); (Smith & Sauro, 2009)
Chatterbots	(Sha, 2009)
CMC (Computer-Mediated Communication)	(Lea, 1992); (Beauvois, 1997); (Pemberton & Shurville, 2000); (Morrell, 2001); (Abrams, 2001, 2003a & 2003b); (Perez, 2003); (Savignon & Roithmeier, 2004); (Thurlow, Lengel, & Tomic, 2004); (Arnold, Ducate & Lomicka 2005); (Fiori, 2005); (Lafford & Lafford, 2005); (Sykes, 2005); (Van Deusen-Scholl, Frei & Dixon, 2005); (Wildner-Bassett, 2005); (Zeiss & Isabelli-Garcia, 2005); (Hoven, 2006); (Kitade, 2006); (Lomicka, 2006); (Lamy & Hampel 2007); (Meskill, 2007); (Sadler, 2007); (O'Rourke, 2008)
Blogs	(Ducate & Lomicka, 2008); (Hsu, Wang & Comac, 2008); (Antenos-Conforti, 2009); (Comas-Quinn, Mardomingo & Valentine, 2009); (Dippold, 2009)
Online workbooks / dictionaries…	(Loucky, 2003); (Zapata & Sugarra, 2007)
Podcasts	(Abdous, Camarena, & Facer, 2009); (Rosell-Aguilar, 2007, 2009)
Virtual worlds, simulation games	(Crookall & Oxford, 1990); (Kötter, 2002); (Shield,2003); (Svensson, 2003); (Schwienhorst, 2004); (Polisca, 2006); (Cooke-Plagwitz, 2008); (Niño, 2008); (Ranalli, 2008); (Deutschmann, Panichi & Molka-Danielsen, 2009); (Kuriscak & Luke, 2009)
Mobile phone	(Kenning, 2007); (Stockwell, 2007)
Tutoring at a distance, error analysis	(Ginzberg, 1989); (Holland, Kaplan & Sams, 1995); (Hamilton, Reddel & Spratt, 2001); (Heift, 2001, 2003, 2006); (Pujolà, 2001); (Ypsilandis, 2002); (Delmonte, 2002, 2003); (Chen & Tokuda, 2003); (Cowan, Eun, Doe & Kim, 2003); (Grander, 2003); (Reuer, 2003); (Schulze, 2003); (Tschichold, 2003); (L'Haire & Vanderventer Faltin, 2003); (Heift & Schulze, 2003, 2007); (Dodigovic, 2005b); (Morton & Mervyn, 2005); (Chiu & Savingon, 2006); (Bertin & Narcy-Combes, 2007); (Byrne, 2007); (Amaral & Meurers, 2009); (Bertin, Narcy-Combes & Gravé, 2009); (Madyarov, 2009); (Nagata, 2009)

continued on the following page

Table 1. continued

Artificial intelligence/ICALL	(Bailin & Levin, 1989); (Last, 1989); (Kang & Maciejewski, 2000);(Sun & Dong, 2004); (Tokuda & Chen, 2004); (Shaalan, 2005); (Harbusch, Itsova, Koch & Kühner, 2008); (Schulze, 2008a, 2008b); (Schulze & Penner, 2008); (Wood, 2008)
Interactive whiteboards	(Tozcu, 2008)
Offline/online learning	(Davies, 2003)
Human-Computer Interaction	(Monk, 1985); (Preece & Keiler, 1990); (Norman, 1986, 1992); (Monk, Wright, Haber & Davenport, 1993); (Redmond-Pyle & Moore, 1995); (Hémard, 1998); (Shneiderman, 1998); (Allum, 2001)
Networks	(Warschauer & Kern, 2000); (Beltz, 2001); (Burnage, 2001); (Tammelin, 2004); (Lomicka & Lord, 2009); (McBride, 2009)
Speech technologies	(Hincks, 2003)
Role play & distance	(Alexander & Dickson, 2006)
Learning environments	(Conacher & Kelly-Holmes, 2007)
Tandem learning	(Little & Brammerts, 1996); (Kötter, 2002); (Cziko, 2004)
Instant messaging	(Sotillo, 2005); (Jin & Erben, 2007)
Wikies	(Arnold, Ducate & Kost, 2009)
Language centres	(Little & Voss, 1997)

aspects technology can take in the CALL research literature.

The variety of uses designed by teachers and didacticians is matched by the unpredictability of the learners' actual practice when confronted with computer-mediated materials. The disparity between original design and actual use further enhances the kaleidoscope nature of technology.

The final difficulty in identifying a clear 'technology' pole lies in the fast pace of its evolution: the rapid succession of technological innovation prevents the teacher as well as the researcher from enjoying the necessary distance to analyze its potential, to experiment with it and interpret new data.

All these dimensions make it difficult to formulate any acceptable and comprehensive definition of technology and as a consequence of the ways in which it can impact the various interactions in the language learning situation. Its integration within a systemic model therefore means that it must be accepted as a dynamic and multi-dimensional variable, as another zone of uncertainty. As a result, the only viable stance in our ergonomic perspective is to avoid relying on or referring to any particular form of technology, but to keep the necessary distance and to reflect upon the principles that can preside over its integration.

This ergonomic approach to technology should especially consider and explicit the two key notions on which it relies: instrumentation and innovation.

Instrumentation

The main issue raised by the insertion of the 'technology' pole into the model can be defined as the passage from the artifact to the instrument, on the one hand, as the integration of the French concept of *médiatisation* (chapter 2) within the pedagogic mediation process, on the other hand. The instrumentation process on which computer-mediation and distance learning is based must be distinguished from the 'instrumentalisation' process thus defined by Rabardel:

(...) Instruments are not given as such to the user: he must elaborate them through instrumental genesis activities. Instrumental genesis activities result from a dual process of 'instrumentalization' and instrumentation:

- 'instrumentalisation' processes are oriented towards the artifact: selecting, grouping, producing and instituting functions, adapting to new contexts, attributing properties, transforming the artifact, its structure, its operation etc... and eventually producing the final artifact by the subject;

- instrumentation processes are subject-oriented: the emergence and evolution of use and instrumented action schemes: their constitution, their evolution through accommodation, their mutual coordination and assimilation, the assimilation of new artifacts into existing schemes[2] *...(Rabardel, 1995, p. 12).*

This means the instrument emerges only as a result of the user's dual activity on the artifact and on himself, with coinciding functions and intentions. For Rabardel, these two instrumental genesis activities constitute the theoretical foundation of the articulation between the institutional processes of artifact design and the design of activities: in our didactic ergonomics approach, this can be translated as the articulation between the teacher- and the learner-oriented subsystems as well as with the necessary regulation loop (Figures. 16, 17 & 19 in chapter 1). Rabardel adds that instrumentation as well as 'instrumentalisation' are cyclical processes alternating phases centered on functional design with others focusing on the identification of users' operating schemes, all of them forming an integral part of the whole design process.

In the same way as Rabardel's industrial model had to be adapted to the language learning situation (chapter 1), so should we refine the notion of the 'user' in distance language learning contexts. Let us recall at this point that the 'industrial user' refers to all the human actors using the instrument in a similar way for the same goal. The necessary distinction between 'teacher' and 'learner' in computer-mediated language learning (technological mediation) is further reinforced in distance learning contexts: the lack of precise characterization of the distant learner, the presence in the learning space of acknowledged but unknown 'virtual peers', mean that the coherence between the two types of instrumental genesis activities remains largely hypothetical. A logical consequence is the enhanced need for a regulation system in distance learning contexts, whose function it is to measure the possible gaps between the original design of the instrument (teacher-orientation) and its implementation in real-life situation (learner-orientation) as well as to provide the necessary feedback for accommodation and assimilation processes.

In this perspective, the originality of computer technology lies in its flexibility, i.e. the adaptable nature of software, which makes it possible to program new functions to suit the various operating schemes of its users. The dialogue between the didactician and the technician should therefore take place on a negotiated basis to define the nature of the technology required to meet the pedagogic needs. The failure to negotiate inevitably leads back to the criticisms of either the technocentric or the anthropocentric approach. An illustration of such failure to negotiate could be the emphasis laid in the 1990s on the newly promoted 'mpeg' format. While technicians advertised the capacity of the computer to display full screen video, little if anything was said of its pedagogic added value compared to the existing television.

What is at stake, then, is the degree of creativity of the various actors and their capacity to imagine really innovating uses of computer technology, bearing in mind that the final objectives remain the sole responsibility of the didactician. The means to reach these objectives, the functions developed for the instrumented process are the result of the dialogue with the technician. Research

in the distance language learning area inevitably questions the two fields of expertise. This in turns leads us to consider that if innovation can indeed be recognized as a driving force for research in didactic ergonomics, the nature of this innovation must be specified.

Innovation

While innovation is commonly related to the notion of progress, the meaning of the term in our field turns out to be less straightforward than expected. The concept cannot easily be categorized as it is unpredictable by nature: will it concern didactic or technological concepts or even original uses of existing technology? All options remain open. Moreover, technological profusion does not necessarily imply pedagogic progress. The advent of the Internet in the educational world, commonly acknowledged as a real breakthrough, suffered in fact from the severe limitations imposed by the initial html language, which reduced the degree of interaction to the single hypertext concept.

One of the reasons for the ambiguity raised by the word 'innovation' lies in the distinction between technological and pedagogic innovations.

Technological innovation is certainly the most visible and appealing type as it is both widely publicized and draws on popular fantasy (the myth of the intelligent machine). Its impact is two-fold: because of its strong appeal, it may allure its users into the technocentric approach; at the same time, it represents a driving force which stimulates the teacher's creativity.

This remark takes us from the notion of technological innovation to that of pedagogic innovation. Pedagogic innovation results from the fruitful dialogue between the didactician and the computer technician. Their interaction can only be justified by explicit and systematic reference to the final process (i.e. language learning). The interdisciplinarity it implies creates a tension between constraints and creativity, especially visible in the design phase (Figure 16 in chapter 1). Constraints may be related to different questions:

- to what extent can technology 'represent discourse' and provide appropriate input for the learner?
- what types of cognitive activities can be supported by the technology?
- to what extent can monitoring devices reveal invisible cognitive processes?
- to what extent should pedagogic objectives be revisited to match the technical specifications of the computer?
- as a consequence, what interactions should be organized between the computer-mediated learning space and the larger learning environment in which the individual learner evolves?

At the same time, all these constraints constitute as many incentives for new technological investigation and research and therefore feed the technician's creativity.

As for teacher creativity, it is stimulated by the new types of learner-materials interactions generated by the technology. Two main types of questions are raised.

To what extent can traditional activities be transferred into the distance learning situation? This means first questioning the added-value of the computer: the advent of the computer in no way makes previous technologies obsolete. Their respective 'ecological niches' should be identified so that the learning environment can draw on the specific potential of each (Bertin, 2001). Is the mere fact of placing a gap-filling activity or a multiple choice questionnaire on the web a real benefit? Irrespectively of the debate on their intrinsic value for language learning as a whole, this example points to the necessity to check whether the change is worth the time and the cost. It may also suggest that traditional activities can also be enriched by new functions inherited from

the computer's digital and interactive nature. This takes us naturally to the next question.

What new activities can be designed? Experience shows that the dialogue between the didactician and the technician is bidirectional: the former does not simply ask the latter to develop the materials he has in mind; the technician also opens new horizons to be investigated in order to check their pedagogic dimensions. This second question assumes the implementation of evaluation procedures and paves the way for the engineering approach which we will develop in a later chapter.

An example of the issues raised by these questions could be the relationships between the technical concept of interactivity and the didactic notion of interaction. If interactivity is indeed accepted as one of the innovative characteristics of the new environments, its interpretation for language learning should however not be taken for granted. De Margerie & Pelfrêne (1990) consider three sources of interactivity:

- the machine: its capacity to be interconnected, the facility it offers to access large quantities of information, the degree to which it can simulate human behaviors;
- the user: the degree of solicitation he is submitted to, the room left for individual freedom of action;
- the communication between the machine and its user(s): degree of elaboration, similarity to real-life interactions…

Moreover, sources and degree of interactivity of the system should be distinguished: in the case of computer-mediated language learning, this could range from the limited interactivity of Programmed Learning to the high degree of interactivity which Artificial Intelligence environments try to generate, via the heuristic discovery provided by hypertext/hypermedia-based materials.

Cognitive interaction however is not limited to the degree of freedom granted to the users but encompasses the possibility for the learners to program their own learning. It is also related to the question of system- or learner-control of the learning space and materials.

It is the researcher's responsibility to organize the dialogue between the various experts involved in this approach and to suggest appropriate models answering the following preoccupations:

- What is the original contribution of the technology to language learning?
- What place can be attributed to the technology in the global learning environment?
- How can information be transformed into knowledge, bearing in mind that the computer is basically designed for information processing?
- How can 'quality' be defined in our field? How can such a definition help the actors resist the technocentric temptation?

Chapelle helps us summarize the situation:

If research on cognitive and social processes helps to identify good opportunities for learning, then how can online tasks help create such learning conditions? (Chapelle, 2003, p. 40)

The role of institutions and policy-makers will subsequently be to determine the means to favor equality of access to the new environments for a higher educational democracy, to refrain from announcement effects and to concentrate on such questions as availability of technology and teacher training.

The 'technology' pole of our model can therefore be interpreted on two different levels:

- in an individual or local pedagogic perspective, it is the instrument of an innovative didactic approach;
- in a social and collective perspective, it constitutes the instrument of an innovative education policy.

PLACE OF TECHNOLOGY IN LANGUAGE LEARNING

What picture can we get of the present situation in language learning contexts? What are the various actors' representations of the technology?

... a significant part of (teachers) immersed in a social system which strongly valorizes the mastery of information and communication technologies try to use them as tools to optimize their professional practice[3]. (Albero, 2004, p. 263)

For Albero, teachers are submitted to the dual pressure of the two cultures in which they live, which cohabit and only partially overlap: academic tradition and modernity (p. 264). In this case, again, social and psychological processes interact. The open question is therefore to determine the bases on which teachers develop the new forms of their practice: intuition or organized reflection? This alternative is reminiscent of Krashen's vision of teaching which *remains an art as well as a science* (Krashen, 1985, p. 53). The proliferation of individual or small-scale experiments with technology points to the creative role played by intuition. Organized reflection is linked to the notion of integration and opens up on to the concept of learning environments.

Integrated Learning Environments

The organized arrangement of objectives and instruments in a given context gives rise to integrated learning environments, so concisely described by the French word *dispositif*.

The word 'dispositif' may be used as a concept opening an area of comprehensibility within the complexity of reality, because it points to a set of interrelated processes acting in retroactive loops and situated in time and space[4]. (Albero, 2004, p. 285)Applying this description to the educational field, B. Albero emphasizes the dual technical and strategic dimensions of the *dispositif*:

The technical dimension points to the creation of an artifact which meets an identified need, through the careful and intentional planning of various components. The strategic dimension stresses the idea that the artifact is elaborated in response to a given situation through various apparently masked but nonetheless present stages: diagnostic analysis of a situation, planned implementation of operational means (material and human), goal-driven action, evaluation and feedback on the action[5]. (Albero, 2004, p. 286)

These elements, combined with the temporal and spatial situation of each environment justifies the engineering approach we have already mentioned. At the same time, learning environments remain clearly systemic in their nature and organization. The interest of this approach lies in the fact that the concept of an integrated goal-driven learning environment can help deflate the original myth of the 'teaching machine' to more realistic – even though complex – proportions and situate the so-called 'new' technologies within a range of available instruments. Once more, institutional issues such as the development of adapted methodologies or teacher training have an important part in the dissemination of language learning environments.

Functions of the Technology

A significant proportion of the literature of the 1980s and 1990s has highlighted the possible functions of computer technology as a support to the language learner (Farrington, 1981, Demaizière, 1986, Robinson, 1991, Brodin & Narcy, 1991, etc…). Most of the advantages then acknowledged remain valid in distance learning contexts: individualization, heuristic strategies favored by a free access to knowledge, absence of direct teacher judgement and dedramatization of learning activities, provision of individualized aid and feedback.

Bertin (2001, pp. 134-36) distinguished between the 'data-base' and the 'learning database'

views of the computer, as a way to organize the articulation between the two teacher-centered and learner-centered systems (chapter 1). The 'database' view reflects the function for which the artifact was originally designed and is based on the model illustrated in Figure 1: interactions are limited to the basic structure made up of the computer's response to the learner's solicitation. Examples of situations based on this model include browsing for information and hypermedia navigation: while there can be no doubt that the learner is exposed to the language, no indication is given of the degree of language noticing and actual acquisition taking place. Technological mediation cannot be equated to mere computer use: it is defined by the extent to which the technology favors pedagogic mediation. In the absence of such mediation, we are faced with a technological version of Krashen's Natural Approach (Krashen, 1981).

A more appropriate model, integrating the various cognitive interactions outlined in the preceding chapters, is the 'learning database' model (Figure 2), in which initial organization of the situation is prepared by the teacher while the computer mediates the task and the subsequent interactions (learners' search for information and answers, evaluation and feedback). The difference with the former model can be seen with the example of Webquests or tasks in which input and materials for research have been pre-organized for the learner to re-discover: the passage through a number of planned 'checkpoints' ensures that a number of language issues are tackled and that the cognitive conflict is most likely to take place. This 'pre-task' planning is complemented by the teacher's mediation during the task through monitoring and guidance.

The evolution in the functions of the computer entails a correlated evolution of the roles to be taken on by the actors:

In spite of a tendency to reproduce tested professional practices, some teachers express their interest, when referring to the changes and evolutions of tasks and roles, in a better student follow-up and a greater coherence between the tool and its uses. As a matter of fact, the terms 'guidance', 'follow-up' and 'autonomy' are recurrent[6]. (Albero, 2004, p. 266)

The nature of these evolving roles will be discussed in a later chapter.

Actors' Perceptions of Technology

Concerns Expressed by Learners

Just as students in higher education have seamlessly integrated the Internet into their daily

Figure 1. Computer-mediated language learning – the database model

Figure 2. Computer-mediated language learning – the learning database model

lives, so will they come to expect technological applications to be integrated into their classroom environments as well. They have come to appreciate the contributions technology can make to enhance their undergraduate education. If the majority of university-level faculty fails to recognize this, the students will go elsewhere. (Spodark, 2005, p. 435)

What may true of the Internet may not be totally true of technology as a whole. Thus, Bertin & Annoot (1997) have shown that language learners tend to appreciate multimedia materials but resent any interference of their activity, when technical problems of inadequate ergonomics bring the technology back to the fore.

According to White (2003, p. 173), learners have three basic major sources of concerns which are related to (1) how personal and professional circumstances impact their learning L2, (2) how they assess their ability and sense of progress (self-evaluation or interpretation of the feedback they have received) and (3) how adequate their course content is to their learning of L2.

White (2003, p. 174) acknowledges that teacher response is not yet well-defined. She suggests that research carried out into advising for self-directed learning in face-to face contexts could inform distance language learning where a lack of interaction is noted between the different fields of L2 teaching, in view of the development of self-directed learning in the past 30 years (Candas, 2009, Benson and Voller, 1997). This also includes reflection on L2 learning and teaching theory, which are often neglected in teacher training (Fotos and Nassaji 2007, Randall, 2007 or R. Ellis, 2003).

As in self-directed learning, the response of the tutor needs to be at once encouraging, interested, empathetic and validating of the experience of students (Benson and Voller, 1997). A limited proportion of support can be carried out in, so to speak, face-to-face contexts (telephone, chat or e-mail or asynchronous conversations).

Concerns Expressed by Teachers

For Ducate & Arnold (2006), teachers commonly tend to use computers to *enhance instruction by making learning more interesting, motivating students, giving them access to more current and authentic materials, and allowing them to be more creative* (p. 6). Yet, by changing the various actors' roles and generating new demands on them, these authors point to a possible *discrepancy between teachers' beliefs that CALL has become a mainstream component in teaching and teaching practices that are perhaps lagging behind and do not reflect their viewpoints* (p. 7).

They note that:

The reasons teachers choose not to implement technology are both practical and philosophical. For some teachers, especially more traditional ones, as mentioned earlier, technology does not fit with their beliefs about effective teaching. (…) Other teachers worry that using computers in class can remove the social aspect of teaching, diminish students' research skills, and encourage laziness. (p. 8)

Observation of the wide range of CALL and distance learning practices has given rise to a clear-cut distinction between technophiles and technophobes.

This Manichean vision generates clans and balances of power that significantly impede serene thinking in the field as well as the dissemination of objective evidence, since research is suspected of ideology[7]*. (Albero, 2004, p. 254)*

Reticence to technology in (distance) language learning situations may be related to the representations of the various types of users: teacher/tutor – institution – learner. Due to growing scientific evidence, teachers' resistance over the years seems to have moved from the initial doubts on the effectiveness of technology for language learning

to functional ergonomics issues as well as to the degree of technical skill required from the users. While this resistance may be gradually decreasing in direct relation to the growing rate of computer equipment, it raises the question of the development of really 'user-friendly' interfaces for both teachers (authoring tools) and learners (platforms on which learning spaces rely).

Reticence may also derive from the way pedagogic choices are made in the institutions: do they result from a collective decision, from local administrative pressure or from national policy? Pedagogic engineering presupposes the active participation of all concerned from the initial stages of the decision-making process down to the implementation phase.

Another source of anxiety is linked to the representation of the time necessary to learn about the equipment, to design as well as to monitor online language learning tasks (Ducate & Arnold, 2006, p. 8). When the institution does not take these representations into consideration, total rejection of the projects may ensue.

All these issues are clearly linked to the degree of information and training provided to the various actors:

- information on the perspectives opened by the technology;
- teacher training on the various areas covered by distance language learning (pedagogic interest, integration of technology, implementation of original methodologies… and initiation to action-research as a way to understand, evaluate, adapt and innovate).

While teachers' representations influence the institutional development of distance learning, learners' representations condition actual practice. Evidence from CALL situation observations shows that although learners are commonly more computer-literate than their teachers, their adhesion to computer-mediated activities may be hampered by the difficulty to reconcile their perceptions of the artifact with the cognitive tool they are presented. A typical example of this would be the learners' difficulty in accepting certain tasks such as paper and pen note-taking, accustomed as they are to the copy/paste function commonly used in non-language learning situations (Bertin, 2000). The didactician's intention to draw on such processes as kinesthetic memorization seems far remote from their day-to-day use of the computer.

Such behaviors reveal representations of the computer in strong opposition with the didactic necessity to allow time for cognitive processes to take place: the time of the computer cannot be the time of the learning process. In such cases, the instrumentation process may fail and give birth to conflictual situations.

More generally, three types of perception of the technology can be outlined (Verdier, 2007, pp. 133-53). The 'contestants' (*les résistants*), characterized by their refusal of the technology in their personal as well as professional lives, mostly oppose second-hand arguments and tend to separate traditional and distance learners on the basis of their relationship to the technology. Among their major reproaches are the time required to develop technical expertise and the emphasis placed on technology to the detriment of pedagogy. The 'functionalists' (*les fonctionnels*) are on their way to accepting the technology and have integrated the usual arguments as to their benefits. They are often the fervent proponents of change in the educational world and its social context and tend to look down on those who have not yet developed a positive attitude towards technology. For them, being the actors of change means integrating technology in the pedagogy. 'Functionalists' constitute the agents of change. Finally, the 'experts' have developed a dual pedagogic and technical competence and can design materials and learning spaces for distance learning as well as administration and learning

management tools. They equate distance learning with individualization and position themselves as leaders in relation to the other two groups.

Representations of the various actors are the key to the instrumentation of the language learning situation. Institutional support is therefore essential to help them evolve. B. Albero notes that the lack of material and organizational support is all the more resented as teachers do not feel that their efforts to investigate the potential of the technology, to adapt their methods and materials and to prepare their students are not recognized by the various institutions. They claim for long-term strategies of ICT integration (Albero, 2004, p. 262). As a result of this lack of institutional recognition, changes in professional practice are sometimes felt to be more virtual than effective:

Contemporary tools mostly serve practices deriving from an academic tradition of teaching and training. Yet evolutions can be expected provided certain conditions are met: improvement of work conditions and access to technologies; support of innovating professional practice[8]*. (Albero, 2004, p. 266)*

Information and training do not however only concern language teachers and learners: computer experts and policy-makers are involved as well, insofar as they must create the conditions for all actors to share what knowledge and expertise is required to construct integrated learning environments. This issue is closely connected to contextual considerations which the next chapter will now develop.

SYNTHESIS

How has the chapter answered the questions raised in the introduction?

- What trends have influenced the relationships between technology and education? While educational technology and innovation are linked with utopias, CALL development should be reasoned in order to take into account designers' didactic intentions as well as learners' actual practices. The systemic background of didactic ergonomics provides a number of methods on which to base the integration of technology.
- Is 'technology' a unified concept? The difficulty to construct the 'technology' pole of the model as a real object is linked to the extremely disparate reality which the term covers. This variety concerns both the design and organization of learning materials and environments (teacher-centered subsystem – Figure 16 in chapter 1) and the learners' practices (learner-centered subsystem – Figure 17 in chapter 1). The specific nature of the 'technology' pole results in enhanced complexity and uncertainty.
- How can technology improve language learning? The quality of technological mediation is determined by two main processes: instrumentation (i.e. the passage form the computer as an artifact to the computer as an instrument, or cognitive tool); the distinction between technological and pedagogic innovation.
- What functions can be attributed to technology? Technological mediation should be considered in the context of a global learning environment organized along clearly identified objectives (referred to as a *dispositif* in French). The move from the data processing tool to the language learning instrument involves a reconsideration of the underlying models (from the 'database' to the 'learning database' models based on (socio)constructivist and cognitive foundations).
- How do language learners and teachers perceive technology? Technology has become a permanent element of our lives. While teachers and learners as social actors

have come to use computers as a matter of fact, their relationships to technology in the language learning context are ambiguous. Various concerns and types of reaction to innovation emerge, which should be acknowledged when designing learning environments.

AUTHOR NOTE

Note: quotations originally in French have been translated by the authors. The original text is presented in the end-of-chapter notes.

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ENDNOTES

[1] *Les technologies, qu'elles soient nouvelles ou anciennes, constituent un achoppement récurrent dans les pratiques des enseignants-chercheurs. Si elles font partie intégrante de la vie quotidienne, elles sont en revanche considérées comme des objets à part lorsqu'il s'agit de recherche ou d'enseignement. Valorisées pour leurs fonctions instrumentales, elles n'en sont pas, pour autant, aisément perçues dans leur dimension épistémique. Utiliser un support technique pour rendre plus confortable ou pour optimiser une activité de recherche ou d'enseignement paraît opératoire ; réfléchir à ce que le support technique modifie dans l'organisation du message et des tâches, ainsi que dans les représentations du sujet (enseignant et apprenant) est souvent perçu comme une perte de temps et d'efficacité. Le coût énergétique et matériel est alors considéré comme trop élevé pour l'individu et le collectif. Pourtant, à dénier trop rapidement les modifications auxquelles conduit l'introduction d'un artefact dans les interactions liées à l'activité de formation, on prend le risque de ne participer qu'à une reproduction infinie de l'identique: un modèle pédagogique techniquement modernisé – parfois à grands frais –, mais toujours le même en ses fondements.*

[2] *Les instruments ne sont pas donnés d'emblée à l'utilisateur: celui-ci les élabore à travers des activités de genèse instrumentale. Les genèses instrumentales résultent d'un double processus d'instrumentalisation et d'instrumentation:*
- les processus d'instrumentalisation sont dirigés vers l'artefact: sélection, regroupement, production et institution de fonctions, détournements, attribution de propriétés, transformation de l'artefact, de sa structure, de son fonctionnement, etc. jusqu'à la production intégrale de l'artefact par le sujet ;
- les processus d'instrumentation sont relatifs au sujet: à l'émergence et à l'évolution des schèmes d'utilisation et d'action instrumentée: leur constitution, leur évolution par accommodation, coordination et assimilation réciproque, l'assimilation d'artefacts nouveaux à des schèmes déjà constitués, etc.

[3] *... Une bonne part des enseignants-chercheurs immergés dans un système social qui valorise fortement la maîtrise des technologies de l'information et de la communication, tentent d'en faire des outils qui optimisent leurs pratiques professionnelles.*

[4] *Le terme de dispositif peut fonctionner comme un concept qui ouvre un espace d'intelligibilité dans la complexité du réel, car il renvoie à tout un ensemble de processus*

interreliés, fonctionnant dans des boucles de rétroaction, situés dans le temps et dans l'espace.

5 *La dimension technique laisse supposer la création d'un artefact qui répond à un besoin identifié, par l'agencement calculé et intentionnel de différentes composantes. La dimension stratégique accentue l'idée d'un artefact élaboré en réponse à une situation donnée par différentes phases a priori masquées mais non moins existantes: l'analyse diagnostique d'une situation, le déploiement calculé de moyens opérationnels (matériels et humains), l'action orientée par le but à atteindre, l'analyse évaluative des résultats et le feedback sur l'action en cours.*

6 *Malgré une tendance à reproduire des pratiques professionnelles éprouvées, certains enseignants expriment, dans les tâches et rôles qu'ils voudraient voir modifier ou évoluer, l'intérêt pour un meilleur suivi des étudiants, une plus grande adéquation entre un outil et son utilisation. De fait, les termes 'accompagnement', 'suivi', autonomie' apparaissent (dans l'enquête).*

7 *Cette vision manichéenne génère des clans et des rapports de force qui font largement obstacle à la sérénité de la réflexion dans ce domaine, ainsi qu'à la diffusion de résultats objectivés, la recherche étant entachée du soupçon d'idéologie.*

8 *Les outils contemporains sont mis d'abord au service de pratiques ancrées dans une tradition d'enseignement et de formation académique. Des évolutions sont cependant envisageables, mais sous certaines conditions: amélioration des conditions de travail et de l'accès aux technologies ; accompagnement des pratiques professionnelles inscrites dans une dynamique de changement.*

Chapter 8
The 'Context' Pole

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OBJECTIVES OF THE CHAPTER

This chapter will try to answer the following questions:

- How can 'context' be defined and taken into account in the case of distance language learning?
- How can ascertain that all the components of this pole can be made to work coherently?

Experimental evidence suggests that the context in which learning environments operate plays such a significant part that it becomes necessary to regard it as just another pole in the didactic ergonomics model. Indeed, as any of the other poles we have described so far, it imposes constraints upon the various actors of the teaching/learning situation and is made to evolve as a result of its interactions with the rest of the system.

Several questions are therefore raised: what is exactly meant by 'context'? How can it be defined? How can its evolution be understood when confronted to technological, pedagogic, or social innovations?

In the first step, we will consider how to define context in a systemic and sociological perspective. In order to make the nature of this pole more explicit, we will resort to organizational sociology which will help us analyze the structural and functional aspects of the specific system formed by distance language learning environments.

In the second step, we will focus on the conditions of change and innovation in contexts and review the various paradigms and results in psycho-sociology

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and education sciences related to change, innovation and the role of active minorities.

Then, we will examine the conditions for innovation to take place and the means to support it through its various actors so as to understand how social change takes place.

Finally, considering that theory is inseparable from practice, we will present a final synthesis of the various paths that can be taken to reconcile them. In our case, this means suggesting a supporting framework combining research and action, theoretical models and directions for action: this leads to an action-research training scheme whose function consists in the mutual evaluation and regulation of researchers and practitioners.

DEFINING CONTEXT

Introduction

The first obvious remark should be: there is no such thing as *the* context. Indeed, the main characteristic of any context is that it is unique, even if one can observe regularities from one context to the other. Provocative as the previous lines may seem, the first question is how to define context.

To try and answer this question, it seems important to us to insist on the complexity of context(s) analysis. Any attempt at describing a complex organizational reality by decomposing it into separate constituent parts would necessarily be reductive, hence our choice to avoid such an analytical approach by opting for a systemic vision. Defining context seems to us to mean analyzing the organization system in which distance language learning environments are set.

Socio Organizational Approach of the Context

Works by the French School of organization sociology and especially by Michel Crozier offer a privileged insight into what we here refer to as 'context'. This approach to organization sociology focuses on the strategic analysis of human and social organizations.

Strategic analysis aims at a better comprehension of human environments, of how collectivities work. In sociological terms, such organizations should be understood as any human collectivity centered on a specific activity. Defining them implies understanding the multiple relationships involved within the system as well as between internal and external elements. It also means analyzing the links and relationships between the various levels of the decision making process and operation. Finally, it supposes analyzing the social actors' behaviors from the perspective of their capacity to act, as distinct from the psychological angle of their motivations.

These analyses reveal a multiplicity of systems of *concrete action systems* (Crozier & Friedberg, 1977) linked to a variety of goals and strategies. It is postulated that goals are different for individuals and groups, which entails different strategies and variable degrees of uncertainty. Power and capacities of action are flexible notions: the solutions given to a problem necessarily favor certain actors to the detriment of others.

Organization sociologists have shown that the dynamism of organized collective action is not a natural phenomenon but a social construct whose emerging and supporting conditions must be explained.

...Organizational issues, the modes of our collective organization are not naturally given [...] they are only specific solutions which relatively autonomous actors, with their own individual resources and capacities, created, invented to solve the problems raised by collective action, and most notably the essential problem of their cooperation, so as to achieve common goals in spite of their diverging orientations[1]*. (Crozier & Friedberg, 1977, p.13)*

In our case, change should be based on a clear view of how language learning systems operate and from which resistance to technology is generated, as suggested by Crozier & Friedberg:

The system should be first conceived as a play where there remain areas of uncertainty and room for action. The diversification of technological tools available to teachers enhances the variety of practices, of mediation modes, and of professionalization processes, all of which impact the system[2]. (Crozier M., Frieberg E., 1977, cited by Papadoudi H., 2000, p. 202)

When new technologies are introduced in educational systems, and because of the rapid pace of their development, retroactive changes will occur: changes in practices and even in the teachers' roles, changes in the modes of teacher-learner relationship and therefore in the skills required for teachers and learners. These changes make it necessary to question the contents of initial and in-service training of all the actors involved in the distance and/or computer-mediated learning environments. Context is dramatically affected by the integration of technology.

Moreover, the existence of different strategies according to the actors concerned must be acknowledged. Indeed, the actors may pursue different aims from those pursued by innovation policies, or define different objectives from institutional ones. While the institution officially privileges integration, it does not commonly go into detail concerning the type of organization, the conditions in which pedagogic activity should take place, or the evolving roles of teachers, learners and other members of the staff. This is especially true in the case of innovating environments such as the ones we are considering in this book.

Finally, one must accept the fact that the integration of ICT within the pedagogic context challenges traditional relationships and activities of the various actors and may even reveal tensions and limits of the system. Tensions appear as resistance to change, which should not be perceived as some abstract or timeless reaction, but as an inevitable and contextualized response. Organization sociologists cannot accept a purely psychological explanation to such resistance. They see it as a socially legitimate response to the balance of power in a given institutional context, depending on the freedom of action left to individual actors. Such social events should be studied in a socio-organizational perspective as part of individual strategies and power relationships within the system (Crozier M. & Frieberg E., 1977).

No computer-mediated or distance learning environment can be implemented in a hostile context (training center, school, university, private company, etc.). An essential provision for the success of such environments is the careful consideration of the conditions of its design and support. Numerous failures are due to the hurried, unreasoned, and non-concerted implementation of projects, taking no consideration of all possible actors.

The successful implementation and the significant development of educational technologies considerably depend on contextual and structural factors[3]. (Papadoudi, 2000, p.42)

What is at stake is accompanying the changes brought about by distance in learning environments. Chapter 2 has shown how distance turns out to be an analyzer. This is especially true of the organizational context in which learning environments are set. The purpose of any socio-organizational analysis is to reveal what is hidden: the informal structures hidden behind the formal organization. The question is to know how to support changes in practices which result from those representations that determine the behaviors of individuals and groups. According to P. Bourdieu, changes in practices are linked to the transformation of what he called *habitus*:

- a set of dispositions and schemata ready to act as structuring elements;
- a grammar of schemes generating practices;
- a set of schemata internalized by individuals since childhood in the course of the socialization process;
- a series of schemata generating a large variety of practices adapted to ever changing situations;
- schemata on which practice is based without the actors being aware of how they work. (Bourdieu, 1980).

Technological innovation plays a significant part in the evolution of *habitus*.

The subjects' progressive discovery of the (intrinsic) properties of the technological instrument takes place at the same time as their schemata are accommodated and as the meaning of the instrument evolves as a result of its association with new schemata[4]*. (Papadoudi, 2000, p. 202)*

Official reports provide numerous descriptions of the obstacles and factors determining the integration into the educational context of distance learning environments. Among these:

- hardware equipment and their rapid obsolescence;
- teacher training;
- costs of equipment and staff;
- absence of prior reflection and involvement of all actors.

When distance is supposedly abolished, the claim to universality of a computer-mediated environment presents high risks. Indeed, no learning environment can claim to be efficient irrespectively of educational policy and culture (Papadoudi, 2000, p.42).

Strategic analysis aims at understanding, in a sociological perspective, how human groups and collectivities are organized in relation to an activity. Its main goals are:

- to highlight the multiplicity of interactions in the group as well as with elements external to the group;
- to analyze the various levels of elaboration and operation of decisions and how they interact;
- to observe the social actors' behaviors in relation to their capacity of action, irrespectively of their psychological motivations.

In the end, the sociological and strategic approach to organizations show that the context is a social construct, and that it remains inseparable from the dynamics of collective action and therefore of the analysis of social change.

Change and Contexts

Among the numerous psychosocial descriptions of context, change and innovation, we will only mention a few representative approaches. C. Tapia (1994) outlines five variables defining the organizational context:

- the staff's philosophy and type of management;
- the degree of elaboration of tools and equipment;
- the demographic structure of the actors: age, gender, training, place in the hierarchy, etc.;
- the size and shape of the organization;
- environmental factors: economic, cultural, scientific.

The dual difficulty lies in the impossibility to consider a predominant factor on which to act in order to optimize behaviors, and at the same time to draw an exhaustive list of organizational contexts[5]*. (Tapia, 1994, p. 35)*

In other words, there is no such thing as a 'context', to take up our initial idea. Only specific contexts exist and their analysis is necessary before envisaging any innovation, especially in the case of such complex systems as distance learning environments.

The introduction of innovation into an organization is the consequence of a variety of interrelated causes depending on the original motivation for change: innovation may result from a crisis, the spontaneous action of minorities, management policy, or again external pressures (Tapia, 1994, p.41). Tapia considers change results jointly from adaptation processes at individual level (psychological dimension) and at the level of the organization (psychosociological and institutional dimension).We think a sociological dimension should be added in order to get a broader view of the relationships between the system's organization and the supra systems with which it interacts.

These three micro (psychological), meso (psycho-sociological), and macro (sociological) levels, in line with the descriptions of the school system by Carré, Blandin, or Cros (1997), can be transferred to our didactic ergonomics approach of distance language learning systems. The psychological micro level (individual, or intra-personal) is linked to the actors' motivational and cognitive aspects (Carré, et al., 1997, Blandin, 1997). The meso (micro-social, or interpersonal) level corresponds to the relationships between the learners, teachers, tutors, peers, and other actors involved. By identifying groups, this level is influenced by the norms and values regulating interpersonal relationships (Blandin, 1997, Lewis, 1999). Other authors refer to these relationships as the socialization processes (Enriquez, 1992), or as the relational atmosphere (Depover, 1996). The sociological macro level points to the *normative culture* (Blandin, 1997) of the educational institution. The term includes the common representations, practices, myths and various fantasies attached to it (Enriquez, 1992), as well as its values, specific history, etc. (Paquelin, 2000, p. 41).

In the specific context of distance learning, we consider that these three interacting levels have a similar influence on the system. Understanding change, therefore, implies not only taking stock of the individual and psychological dimensions of interpersonal relationships among actors, of the sociological dimension of the cultures and values associated to a given context, but also of the interactions between these dimensions.

ADOPTING CHANGE, SUPPORTING CHANGE

We have so far defined the various dimensions of social change in the context of distance learning. We will now consider the social dimensions of innovation and the necessary conditions for its acceptance by the various actors. We will finally examine the means by which innovation can be supported.

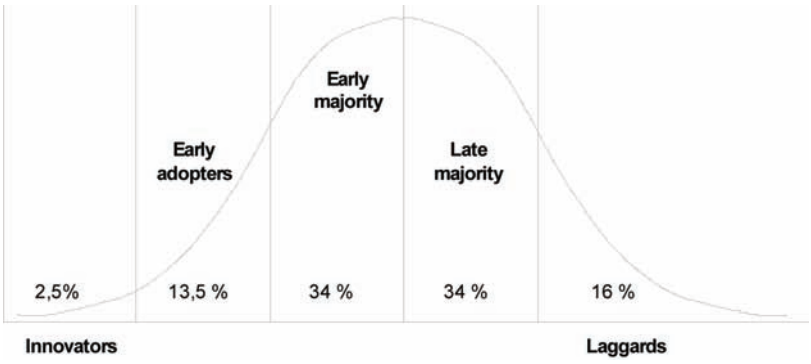
Social Innovation

Innovation can first be defined by what it is not. It is not a reform, which is initiated by the political authorities and is concerned with general policies (Cros, 1996, p.19). A reform is linked to social change (Ducros & Finkelzstein, 1996, p. 32), is meant to centralize, generalize, standardize and plan (Peraya D. & Viens J., 2003). The process of its implementation is top-down.

Neither can innovation be confused with renovation, which consists in refurbishing or updating the system in order to reinstate the initial objectives that might have become blurred with time (Cros, 1996).

Innovation is related to some specific action and can be regarded more as a process than as a product (Cros, 1996, p. 19). Together with reform, it is intention-driven, but as distinct from the latter, it is based on a *strategy of scheduled change* and focuses on the *proposed integration by individuals of an innovative product deriving*

Figure 1. (adapted from) Rogers's Innovation Adoption curve



from some external expertise (Gelinas & Fortin, 1996, p. 118). Reform originates in a global vision of society while innovation tries to meet a specific problem in a given context, even though it may be initiated by political authorities. De Ketele defends a more radical position by considering that innovation proceeds from untold wishes or potentials (2002, p. 47). *Innovation cannot be transferred; it must constantly be reinvented* (De Ketele cited in Peraya & Viens, 2003, p. 12). Gélinas & Fortin (1996, pp. 116-119) see innovation as a driving force for a change in practices, hence the necessity to take into account all the actors of the organization as well as the constraints and resources of the context.

Adopting Change

We will not here review all the models of innovation integration and we will focus more specifically on Rogers's initial model and Moscovici's perception of the roles of active minorities.

Rogers's innovation adoption curve is a model that classifies adopters of innovations into categories based on the idea that certain individuals are inevitably more open to change than others (Figure 1).

He outlines five categories:

- the 'innovators', characterized by their bravery, their aptitude to lead and stimulate change, and their important communication;
- the 'early adopters', described as respectable people, opinion leaders, ready to try out new ideas, although in a cautious way;
- the 'early majority', made up of thoughtful and cautious people, accepting change more rapidly than the average;
- the 'late majority' are sceptical people who will only adopt new ideas and products once the majority has already done so;
- the 'laggards' are traditional people, observant of traditional practice, critical of new ideas. These will only accept new ideas when they have become mainstream or even tradition.

Rogers's innovation adoption curve shows how useless it is to try and convince the majority of new and controversial ideas. It suggests it is better strategy to deal with innovators and early adopters first.

This typology is close to Moscovici's vision of the role of acting minorities in innovation processes, considered as the main promoters of change (1984, p. 51-89). For Moscovici, the innovation process is a process of social influence whose origin is to be found in a minority or an individual striving to introduce new ideas, new practices or to modify existing ideas and attitudes (1984, p. 55).

Psycho-sociologists generally define the notion of minority in quantitative terms, as a number of individuals inferior to half the total number. However, this definition does not account for the fact that individuals play a variety of psychological and social roles, and thus belong to several types of group. Defining a minority without ambiguity is therefore a highly difficult task and can only be contextualized:

It must be defined in a relative way, i.e. in relation to some reference group or to some significant social reality[6]. (Moscovici, 1984, p. 55)

What specific features of a minority are likely to trigger some innovation process?

The first distinctive feature of a minority at the origin of innovation consists in its conscious opposition to accepted norms and in its firm adhesion to a challenging norm, which give this minority the status of an active potential partner in social relationships[7]. (Moscovici, 1984, pp. 57-58)

Yet, this single feature does not account for the extent to which the new norm challenges those accepted by the majority, nor for the orientation of this challenge: does it simply amplify the existing norm, even to an extreme (which Moscovici refers to as an *orthodox or pro-normative group*) or does it oppose the dominant norm by suggesting a minority proposal (which Moscovici calls a *heterodox or counter-normative group*) (Moscovici, 1984, pp. 57-58)?

The actors involved in the development of computer-mediated and distance language learning environments can indeed be assimilated to such active minorities, as counter-normative groups.

Another feature of the minority is its visibility and its social recognition by the majority.

It should miss no opportunity to be noticed, identified and listened to. The right of the minority to act and provoke change in its material and social environment can accurately be assessed by the effort to gain visibility and social acceptance. So is its capacity to bring other people to share its views[8]. (Moscovici, 1984, p. 58)

This point marks the passage from the initiation of innovation by such minorities to the adoption of innovation by the majority. The stakes are high and the debate is hot between the advocates of a progressive, step-by-step adoption (the initial adoption of innovation by a minority preceding general acceptance) and the proponents of a co-construction of innovation involving all the actors from the start.

For this reason, some authors have identified different stages in change. Such is the case of Chin (1976), who identified five degrees of complexity in the adoption of change: substitution, alteration, variation and perturbation, restructuring, and total change of values. Zajc (1993) refined this model and showed how it can be applied to pedagogic innovation in higher education contexts. She suggested that if innovation mostly concerns the learners and the teachers, it also induces changes in the institution as it entails modifications in the syllabi. We would personally add that it also affects other actors of distance learning environments, so deep are the changes in practice involved in this particular case: designers, tutors, technicians, administrative and management staff. Distance learning makes it necessary to revisit the organization and social division of labor within the institution. It is not a mere substitution of one product or tool by another, nor even a simple modification of part of the teachers' job, for example. It means a radical reconsideration of their social and professional roles (transmitting knowledge/supporting the learner in the construction of his/her knowledge).

The question then is how to support such a deep professional mutation and how to identify and specify emerging roles. Should these changes be supported by training and if so, how can this be defined? How should the relationships between pedagogic practice and research be organized?

None of the existing innovation adoption models explains how the practices of innovators and early adopters, or even active minorities, can be generalized to the other types of population in each specific context. They seem to converge on the idea that innovation processes should rely on innovating minorities rather than on a top-down approach. The question we would need to answer in our case is how to identify such innovating actors: are they teachers, learners, computer or network technicians, or administrative staff in university colleges? Or are they part of institutional management and policy makers? Maybe they are all of these, in varying degrees, according to their strategies and real power in the organization, to their level of cooperation, etc.

Perhaps we can identify among these organizational variables the specific features of the context in which innovation can be implemented.

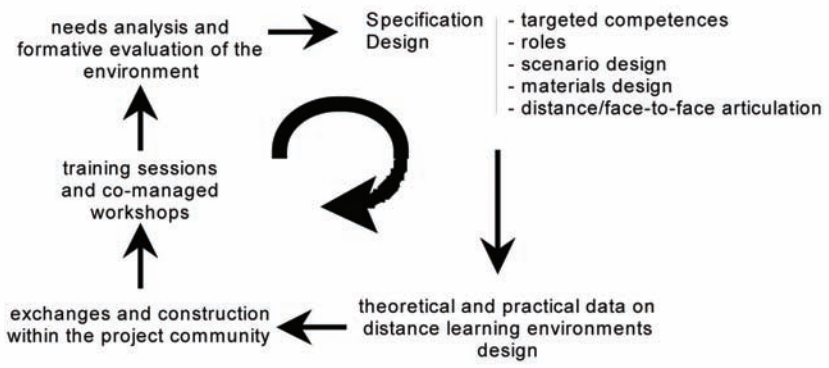
Two Experiments in Europe

Experiments of actors-centered innovation have been carried out in Europe. Such is for example the case of the LearnNet project (2002), whose objective was to create a network enabling Belgian and European prospective teachers to develop technical skills in ICT by using technology as a means of learning. At the same time the project was an action-research to observe how things would take place in order to specify, to experiment with and to evaluate the modes of integration of distance learning into teacher training syllabi (Charlier, & Peraya, 2002, p.5). The project showed that innovation was accepted in very different ways according to contextual constraints, and to the degree of involvement of teachers and institutional actors. Charlier, Bonamy & Saunders (2002) have outlined three main modes of adoption and appropriation according to local contexts:

- An 'additional mode', typical of universities where the integration of the project in the normal schedule was difficult and where teachers did not expect any project to change their practice or their uses of ICT. The project was therefore perceived as a pilot experiment, and it was proposed to students on a voluntary basis, as an addition to their curriculum which remained untouched. While beneficial effects were visible for students and tutors, no impact whatsoever was noticed on institutional factors.
- An 'adaptation' mode, characteristic of universities where no congruent practice existed previously, where an integration of the project into the curriculum was possible to a certain extent only. Such contexts were also characterized by a clear involvement of a teacher (often on his/her own), with strong support from the institution. These were cases where the conditions had to be created for the emergence of innovating practices.
- A 'transitional' mode, illustrated in universities where some kind of practice pre-existed (project-based pedagogy) and where the insertion of the program into the schedule (at least 30 hours) was possible. Furthermore, teachers (most often teams of teachers) had projects of distance learning experiments with the support of their institutions. (Charlier, Bonami & Saunders, 2002, cited by Peraya & Viens (2003, p. 14).

This experiment tends to show the importance of taking local contexts into account when launching innovation processes, their constraints and resources, as well as the degree of involvement of the actors. Innovation cannot be implemented without the actors: in such a case, we are back to the top-down model. The question, then, is how to involve the actors so that they are the active subjects of innovation, instead of being submitted to it? Another way of putting it is how to place the actors at the center of the innovation process?

Figure 2. Typical cycle of intervention (adapted from Peraya & Viens, 2003)



In this perspective, Peraya & Viens (2003) relate how they met an order from the Swiss government by suggesting the design and implementation of a research – action – training program. By asking all the actors to collaborate in research, interpretations and training, the whole process becomes meaningful to everyone and can thus be regulated by all (Peraya & Viens: 2003, p. 15). This type of program deliberately focuses on the actors.

It combines research and pedagogic support for the mutual benefit of all. It aims at making all the actors partners of the output of research, of the training sessions, of the interpretations given to the situations observed. As distinct from the reform approach, it does not only mean to support a project but it aims at enhancing the innovating pedagogic practices of the distance learning project and at developing their e-learning culture. In this perspective, the actors are not considered as subjects to be observed and transformed according to standards, but as individuals taking part in all decisions, actions and constructions of meaning. The program is organized as a series of iterative cycles, each of which refines former analyses. The cycles consist in verbal exchanges and specifications by the actors of pedagogic scenarios and of all other elements involved, in debates on the various issues, drawing on theories and practices evidenced by research. The debates are enriched by the participation of the whole project community which co-constructs meaning and regulates the activities of training and support. In the end, the training sessions, seminars and workshops are managed cooperatively (Peraya & Viens: 2003, p. 19-20).

This perspective is illustrated in the following diagram (Figure 2).

Adopting this type of model to support social innovation is justifiable provided it is reoriented towards objectives more in keeping with our domain. Although our purpose is close to the experiments described in terms of social and pedagogic support, the objectives set for our didactic ergonomics model and its support suppose taking other factors into account. Thus, the training – action – research program would be oriented to the support and guidance of the various actors, in relation with the following issues:

- how to develop the new roles and activities required by distance learning;
- how to analyze and benefit collectively from the various ICT integration experiments in language learning situations;
- how to combine practice and research by developing exchanges between teachers and researchers;
- how to identify the needs of the various actors derived from their new roles, and to develop appropriate initial and in-service training programs.

SYNTHESIS

How has the chapter answered the questions raised in the introduction?

- How can 'context' be defined and taken into account in the case of distance language learning? Because no two contexts are alike, context(s) analysis is of particular importance to ensure the efficiency of a learning environment. The socio organizational approach of the context, especially strategic analysis, can help understand how human environments work. Change should be based on a clear view of how language learning systems work as well as of the types of resistance to technology to be faced. The systemic stance taken by the authors means that contexts will necessarily evolve as a result of innovation and should therefore be conceived in a dynamic perspective.
- How can ascertain that all the components of this pole can be made to work coherently? Several guiding principles can be outlined from the preceding pages in order to make sure all the components of the distance language learning system can be made to work coherently within their specific context. They are listed as follows:
    1. As the other poles of the didactic ergonomics model, the 'context' pole appears to be characterized by a high degree of complexity, requiring a systemic approach for its comprehension.
    2. As there proves to be no such thing as a general or universal context, but as many contexts as there are specific social situations, the specific features of each context should be clearly identified. This analysis can be based on the theoretical foundations of interactionist and systemic sociology, and can rely on the concepts of strategic analysis of organizations.
    3. Psycho-social approaches to innovation suggest we should rely on the roles and actions of innovators and social minorities to adopt and support change.
    4. Among the various definitions of innovation, the most promising model for the integration of new practices is the one that involves all the actors from the start, taking into account their individual representations, as well as the constraints and resources of the specific organization.
    5. The former principle points to the necessity to design some kind of socio-organizational scheme to support innovation. A project control approach can be developed for each institutional and pedagogic context, opening onto a program of training – action – research for all the actors involved. This type of program might be inspired from experiments such as LearnNet[9] or Virtual Campus, based in Switzerland. This training – action – research program would aim at supporting and guiding the various actors in relation to:
- how to develop the new roles and activities required by distance learning;
- how to analyze and benefit collectively from the various ICT integration experiments in language learning situations;
- how to combine practice and research by developing exchanges between teachers and researchers;
- how to identify the needs of the various actors derived from their new roles, and to develop appropriate initial and in-service training programs.

These principles represent as many guidelines to operate the didactic ergonomics model in specific contexts, and will therefore form the

basis of the third part of this book (Operating the model).

AUTHOR NOTE

Note: quotations originally in French have been translated by the authors. The original text is presented in the end-of-chapter notes.

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ENDNOTES

1 *... les problèmes d'organisation, nos modes d'organisation collective ne sont pas des données naturelles (...) ils ne constituent rien d'autre que des solutions spécifiques, que des acteurs relativement autonomes, avec leurs ressources et capacités particulières, ont créées, inventées, instituées pour résoudre les problèmes posés par l'action collective et, notamment, le plus fondamental de ceux-ci, celui de leur coopération en vue de l'accomplissement d'objectifs communs, malgré leurs orientations divergentes.*

2 *Il faut d'abord concevoir le système comme un jeu d'acteurs où perdurent toujours des zones d'incertitudes ainsi que des marges de manœuvre ; la diversification des outils technologiques mis à disposition des enseignants accentue la diversité de façons de faire, des pratiques éducatives de médiation et des processus de professionnalisation, ce qui interpelle, à bien des égards le système.*

3 *L'application réussie et le développement significatif des technologies de la communication dans l'éducation dépendent grandement de facteurs contextuels et structurels.*

4 *La découverte progressive des propriétés (intrinsèques) de l'instrument technologique par les sujets s'accompagne de l'accommodation de leurs schèmes, mais aussi de changements de signification de l'instrument résultant de son association à de nouveaux schèmes.*

5 *La double difficulté réside dans l'impossibilité à la fois de considérer un facteur prédominant sur lequel agir pour optimiser les comportements, mais aussi d'établir une typologie exhaustive des contextes organisationnels*

[6] *Il faut donc la définir de façon relative, c'est-à-dire par rapport à quelque groupe de référence marquant ou par rapport à quelque réalité sociale marquante.*

[7] *Le premier trait distinctif d'une minorité auteur d'un processus d'innovation se rapporte donc à son opposition consciente à la norme de la majorité et à son adhésion ferme, à sa défense d'une contre-norme qui font d'elle un partenaire actif potentiel dans les rapports sociaux.*

[8] *Elle ne doit négliger aucun effort pour se faire remarquer, identifier, écouter. C'est justement dans ce processus d'acquérir de la visibilité et de la reconnaissance sociale que l'on peut correctement évaluer le droit de la minorité à agir et à provoquer des changements dans son milieu matériel et social, tout comme sa capacité à amener autrui à partager son point de vue*

[9] *LearnNett. (2000). Espace de présentation publique télé-accessible à l'adresse:* http://tecfa.unige.ch/proj/learnett *[consulted June 26, 2003].*

Chapter 9
Interactions and Distance Learning

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OBJECTIVES OF THE CHAPTER

This chapter will try to answer the following questions:

- How can the various types of interactions between the five poles of the model be envisaged?
- What new issues emerge from this review?
- How can this apply to distance learning contexts?

In the second part of this book, we discussed the nature of the five poles on which our didactic ergonomics model rests, as well as the nature of the language learning process around which the system revolves. While, in some cases, we could identify sets of theories on which to construct acceptable representations, we were faced with a number of areas where uncertainty proves to be unavoidable. This in no way invalidates the model but points to the complexity inherent in any attempt to describe human behaviors and actions.

INTERACTIONS WITHIN THE MODEL

Studies on interactions in distance learning are numerous, and can be mainly characterized as (a) centered on the learner and (b) of analytical type. An example of the first type could be Thurmond's definition of interaction as:

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...the learner's engagement with the course content, other learners, the instructor, and the technological medium used in the course. True interactions with other learners, the instructor, and the technology result in a reciprocal exchange of information. The exchange of information is intended to enhance knowledge development in the learning environment. Depending on the nature of the course content, the reciprocal exchange may be absent – such as in the case of paper printed content. Ultimately, the goal of interaction is to increase understanding of the course content or mastery of the defined goals. (Thurmond, 2003, p. 4)

Analytical studies would tend to agree on the existence of four types of interactions: learner-content (language, in our case), learner-peers, learner-teacher and learner-technology, also referred to as learner-interface (Chen, 2002, Ehrlich, 2002, Navarro & Shoemaker, 2000, Rovai, 2002, Swan, 2001). Thurmond & Wambach (2004) note that while the first three forms of interaction are shared between face-to-face and distance learning situations, only the fourth type of interaction (learner-interface) may be totally absent from traditional classroom situations.

In a Web-based course, the learner-interface interaction can have a tremendous bearing on students learning the content (Hillman et al., 1994); consequently, instructors need to consider the impact that Web-based technology will have on learning when designing Web-based courses. (Thurmond & Wambach, 2004)

By focusing on this specific interaction, it seems to us that such analytical approaches fail to take into account the diversity of the impact of technological and distance mediations. In our ergonomic perspective, a comprehensive view of the system requires considering how this impact takes place in the variety of interactions outlined in the model, and how the existence of the modified interactions induces retroactive changes in the initial nature of the poles. This description, however, can only be partial and tentative, as little research has yet been conducted on these specific issues. Furthermore, as most of these interactions entail cognitive and mental processes, they are not directly accessible to the researcher who can only observe their external effects and the actors' behavior. This chapter will therefore envisage only the main issues raised by the systemic and ergonomic approach to distance language learning. Our aim will be to identify the main interfaces in the system, i.e. the 'places' where significant interactions take place, so that the various actors in the language learning environments (designers, teachers, tutors especially) can construct these interfaces in such a way that the expected interactions will coincide as much as possible with the initial didactic intention.

The flow of information from one element of the system to the other determines a number of interacting sub-systems presented in chapter 1. From an ergonomic point of view, any of these can be considered on its own, but it is their global articulation which gives the environment its global coherence and provides a measure of its potential pedagogic quality. Each of these articulations constitutes an interface whose form should be thought in relation to its users as well as to its interactions with the other sub-systems.

Any description of the sort remains limited in its scope, as the three levels of mediation we have outlined, the necessity for the actors to reconstruct the enriched reality generated by technology and distance, as well as the multiplicity of forms and uses of technology (chapter 7) add to the complexity of the situation. Furthermore, the learners' various uses of materials and learning spaces are characterized by their evolution in time: indeed their perceptions and expectations change as they interact with the instrument, which gives the system a dynamic dimension, independent from the one introduced by the evolution of technology. The convergence of these diverse forces in the

system makes it impossible to provide a static description of online language learning environments. The necessary limitations of this chapter must however be understood to represent objects for further research.

Language Learning Process ⇔ Instrument

The relationship between the instrument and the process is primarily defined by what it is meant to improve. In his review of the research literature in the field, Hubbard lists a number of such improvements expected from CALL environments:

- *learning efficiency: learners are able to pick up language knowledge or skills· faster or with less effort;*
- *learning effectiveness: learners retain language knowledge or skills longer, make deeper associations, and/or learn more of what they need;*
- *access: learners can get materials or experience interactions that would otherwise be difficult or impossible to get or do;*
- *convenience: learners can study and practice with equal effectiveness across a wider range of times and places;*
- *motivation: learners enjoy the language learning process more and thus engage more fully;*
- *institutional efficiency: learners require less teacher time or fewer or less expensive resources* (Hubbard, 2009, p. 2).

As we have seen in previous chapters, the instrument as a concept results from the appropriation of the artifact by its various users. This means several instruments may exist according to the point of view considered. As in our case the instrument is at the same time goal-oriented and technology-supported, it can be conceived in different ways. It may either be visualized as the learning space, i.e. the virtual or immaterial context in which the learner is immersed during the learning process, or as the language learning materials, i.e. the tasks and their related documents. Both are indeed designed in order to reach the final goal: language learning. The richer the environment, i.e. the more functions it offers, the more likely it is to trigger the learner's cognitive processes.

This wealth may however present risks, if the learner is not adequately guided in his use of the instrument. Browsing through the environment, testing each available option might lead to losing sight of the final goal and end up more time-consuming than pedagogically efficient. The teacher's role consists both in organizing access to the materials and in providing the necessary guidance. In turn, this supposes the availability of a monitoring/follow-up function in the instrument.

Guidance may also entail some sort of constraint to the learner's freedom of navigation, all the more so in a distance learning setting, which the learner may access whenever he chooses, irrespective of the teacher's synchronous presence. This leads to the distinction between the relative roles of teachers and tutors. Although specialized literature shows a variety of descriptions on this point, it could be argued that the tutors' role is more specifically related to online follow-up and feedback while the responsibility for guidance is shared between teacher and tutor when these are different persons.

Teacher ⇔ Instrument Interactions

This relationship, on which the teacher-oriented sub-system (Figure 16 in chapter 1) relies, is determined by the following question: how can pedagogic mediation be organized so that, on the one hand, the instrumentation of the learning situation enhances the quality of mediation, and, on the other hand, distance does not impede the implementation of pedagogic mediation?

The originality of this relationship lies in its dual nature, since the computer is used as two

different instruments pursuing complementary although distinct pedagogic and didactic goals. The pedagogic function of the computer corresponds to the forms technological mediation is given in the learning space provided for the learner. The didactic function enables the teacher to plan and design the tasks and the related language learning materials.

The first function gives birth to the 'virtual teacher' whose role in the learner-centered subsystem (Figure 17 in chapter 1) has to be planned and organized. If *the world is a stage*, so is the distance language learning situation: the teacher holds the strings from behind the stage, his presence being mediated by the screen and the structure of the virtual learning space. The similarity stops at this point, however, because the plot of the play can never be totally written out. It is framed and, to a certain extent, constrained by the teacher/designer/author, but only the learner/actor gives life to the play and writes the final lines of the plot. The degree of uncertainty which characterizes the situation constitutes an essential feature of the 'teacher-instrument' relationship.

The second function of the computer is related to the design of the setting in which the play will be enacted. The nature of the relationship changes as the question is no longer "what to design" but "how to design" language learning materials. This relationship is defined by the degree of technical expertise required from the teacher/designer. It is also related to the options offered to the teacher in terms of available tools for materials design. Such options range from ready-made templates and authoring tools to the expert computer programming languages. The degree of freedom and creativity is in direct relation with the degree of technical expertise required, and the more elaborate the learning space, the more necessity there is to create teams associating didacticians and computer experts.

These functions have given rise to abundant research literature on CALL or Web-based materials design, such as (Johnson & Brine, 1999), (Hémard & Cushion, 2001), (Gimeno-Sanz, 2002), (Hémard, 2003), (Godwin-Jones 2003), (Hubbard & Bradin Siskin, 2004), (Colpaert, 2004, 2006a, 2006b), (Cushion, 2006), (Farmer & Gruba, 2006), (Ward, 2006) or again (Mallon & Mallon, 2007), to name but a few.

As a consequence, in distance learning situations, the teacher's role has to be revisited: from the practitioner he originally is, he must develop the methods to analyze classroom experience and formalize what can be transferred into computer-mediated environments. Action-research forms an integral part of his activity and helps him outline his new role as an environment designer. The question remains open as to the degree of competence he should acquire in the latter role, as this involves highly specialized tasks such as graphic design, computer programming, etc. Other correlated dimensions of the role should also be considered, as any decision in the design phase is constrained by contextual elements. Such is the case, for example, of the balance to be struck between financial and didactic considerations: do free online design tools offer pedagogic functions and quality similar to more expensive tailor-made tools? The answer given to such questions conditions the extent to which the learning process will be facilitated in the learning environment.

Making decisions before, during, or even after the design phase implies evaluating the various options available. Such evaluation requires sufficient expertise in different fields, such as language acquisition theories, functional ergonomics, or again financial considerations.

The development of distance language learning, then, involves considering what new roles are entailed, what skills they require, and how national institutions should eventually integrate these skills into teacher preservice training curricula as well as into in-service training (Passey & Samways, 1997; Egbert, Paulus & Nakamichi, 2002; Fitzpatrick & Davies, 2003; Barr, 2004; Ducate & Arnold, 2006; Hubbard & Levy, 2006;; Lewis, 2006; Hubbard, 2008).

Language ⇔ Teacher Interactions

This relationship determines the language objectives (the contents) and is of course strongly influenced by context (national/local language policies, institutional position regarding educational technology). The instrumentation of the pedagogic process and the introduction of distance have as such a limited impact on the formulation of objectives.

Conversely, the modes of learning (stand-alone or add-on materials) (Hotte & Leroux 2003, p. 2) determine the relationships which exist between the (virtual) learning space and the learning environment at large (see chapter 1). In the case of stand-alone distance courses, the two systems coincide and their objectives are identical. Language objectives are constrained by the nature of the available technology, its capacity to present authentic input and to allow effective communication for collaborative/cooperative task work. In the case of add-on courses or materials, the objectives may differ between learning space and learning environment, to fit the technological constraints or the enriched pedagogic potential of the computer on the one hand, and the specific nature of face-to-face situations on the other hand.

Language ⇔ Instrument Interactions

Technological innovation (especially networks and computer-mediated communication – CMC) has totally changed the nature of the questions asked only a decade ago concerning the relationships between language and technology. In 1999, Mathias Schulze defined this relationship as resulting from the following questions:

1 Can there be an appropriate language description to become usable in computer applications?
2. *If there is such a description, is it useful for language learning?* (Schulze, 1999).

In the same year, Michel Perrin asked how it was possible to take advantage of the computer's binary power to reach the pragmatic nature of language, adding that

the linguistic nature of in vitro is not necessarily conducive to the communicative nature of in vivo (Perrin, 1999).

Since then, the situation has evolved and we are not considering language simulation anymore, but computer-mediated communication, an almost 'real-life' type of communication. While this new paradigm renders former questions obsolete, it raises new issues affecting the type of interactions between language and technology.

One of these issues, still to be thoroughly investigated, concerns the way CMC affects language, and how close it comes to authentic human communication. The impact of instant messaging and chat-rooms on language can be noticed both in terms of syntax, spelling, and sociocultural considerations. The presence in learning spaces of CMC tools necessarily impacts the language (Crystal, 2001). A pending question, for instance, is the use that can be made of online chat-rooms for peer-to-peer communication: as the language used by learners is closer to oral discourse than to authentic written production, resorting to written chats or instant messaging may eventually lead to fossilization of inappropriate forms and context. The nature of the language itself is made to evolve and the technology appears as a counter measure to standard-setting forces such as dictionaries, writing, publishing, and broadcasting (Chapelle, 2003, p. 20). The exemplarity of input is more and more questioned by CMC and both teachers and designers are faced with new choices.

Another consequence of technological evolution is that the scope of didactic thinking has grown from the 'pre-communicative activities' on which research focused in the 1990's (Seedhouse, 1992) to the development of a wider and more authentic language competence. In other words,

Schulze's *appropriate language descriptions* are no longer to be understood as the compatibility between binary power and pragmatics. They can be reformulated in terms of what Richterich & Widdowson called 'linguistic' and 'pedagogic descriptions' of language (Richterich & Widdowson, 1981), which it may be more appropriate to call 'pragmatic' descriptions, or 'pedagogic mediation' descriptions. Although linguistic descriptions were initially thought to be directed to linguists only, they should no longer be totally rejected from the field of didactics since we now know that learners draw on rules as well as exemplars or instances (chapter 5). Furthermore, the teacher bases the design of his macro-tasks on pedagogic descriptions of language while relying more specifically on linguistic descriptions to design micro-tasks.

Technology and distance learning have also opened new perspectives in considering the nature of input in language learning materials. Distinctions between authentic discourse, descriptions of language, input language and learner's output (such as Coste's, 1981) raise questions as to the differences between discourse and input and consequently as to how to build communicative competence in distance learning contexts. The debate in the 1990s, based on the wish to produce a hologrammatic relationship between discourse and input (Bertin, 2000, 2001) has been made obsolete by the new CMC facilities. The language to which the learner is now exposed in the learning space is no longer restricted to simulations on the screen but includes 'traditional' input from a variety of materials and 'real-life' interactions with teacher/tutor and peers (Figure 17 in chapter 1).

CMC does not however escape some of the criticisms expressed about the pedagogic use of authentic documents in the classroom. In the same way as these documents lose part of their authenticity due to the change of context to which they are submitted (Besse, 1987), the question is to determine the extent to which technological mediation of human communication impacts not only the language used (see above) but also the context of enunciation and the sociocultural nature of the communication.

Learner ⇔ Teacher Interactions

The introduction of distance in the language learning situation has quickened the pace of learner 'empowerment' initiated by technological mediation. This devolution of power from the teacher to the learner may be accounted for by various factors:

- the passage from the physical classroom to the enriched reality generated by the computer screen and reconstructed by each learner;
- the essentially heuristic nature of hypermedia-based learning spaces;
- the difficulty for the teacher to organize and plan the learners' interactions with the language in such environments;
- the difficulty to control the actual use of the online materials and the resulting gap between didactic intention and practice.

The change of paradigm affecting learner-teacher relationships can be considered at two levels at least. On the one hand, the articulation of the teacher-centered and the learner-centered sub-systems (Figures 16 & 17 in chapter 1) is structured along new lines that move away from traditional linear teacher organization. Once the final goal is clear to teachers and learners, what matters is no longer the way the task is achieved, or even if it is completed satisfactorily. What matters now is whether the language interactions generated by the task result in language acquisition for the learner.

On the other hand, the question of power or control over the learning situation opens up several possible design strategies.

- The teacher should retain control of the situation: the role of technology is mainly to monitor the learner's activities and provide feedback. In this light, so-called teacher-control is essentially related to pedagogic mediation, not with actual 'power'.
- The learner is given full control of his actions within the learning environment/learning space. This position seems coherent with present views of language learning and finds an almost ideal support with hypermedia and Internet-based activities. Yet, the danger of 'getting lost in hyperspace' (Mayes et al., 1990, p. 124) and of losing sight of the final goal re-open the debate of the 1980s over the limits of learner autonomy and the need for guided autonomy. Full learner control also enhances the risk, linked with isolation in distance learning contexts, of demotivation and eventual drop-out.

In both cases, the initial question of teacher versus learner control is replaced by the question of the nature and the required amount of teacher mediation in a heuristic environment. The answer given to this question significantly impacts the institutional context as it affects the mode of learning and the actual organization of the environment. An appropriate solution seems to be the development of blended learning environments. New lines of research on 'intelligent online tutoring' may also provide original prospects in relation to this major question.

Whatever their forms, learner-teacher interactions are given major importance by learners (Thurmond & Wambach, 2004). They note that their quality in Web-based environments can be equal to, or even better than, traditional classroom situations (Lenhart et al., 2001). Quality of interaction is expressed in various ways. Many authors note that the absence of face-to face interaction may have a significant impact on learning (e.g. Barnes, 2000; Chen et al., 2001; Beard & Harper, 2002; Ehrlich, 2002). Restauri et al. (2001) however mention that frequency and personalization of contact may be more important than physical presence. Timely feedback also contributes to positive perceptions of this type of interaction (Collis et al., 2001; Thurmond et al., 2002; Vrasidas & McIsaac, 1999) as it informs the learners on their progress and on the means to improve their performance further (Chickering & Ehrmann, 1996; Chickering & Gamson, 1987). Conversely,

lack of timely feedback can result in learners' ambiguity about their performance in the Web-based course and can contribute to their frustration. (Hara & Kling, 1999)

Language ⇔ Learner Interactions

Learning in a distance learning environment is favored by a high degree of interaction with the course content (Leasure et al., 2000; Swan, 2001) and Web-based courses more particularly are felt to encourage deeper immersion and interactions than traditional face-to-face courses (Thurmond & Wombach, 2004).

The ergonomic model presented in chapter 1 (Figure 21 in chapter 1) clearly shows the variety of forms these interactions can take according to the specific setting. As each environment is by nature contextualized, a necessary step in the design phase will be to identify the interfaces where learner and language interact:

- within the learning space: the learner-centered sub-system (Figure 17 in chapter 1) illustrates the various types of interactions;
- within the learning environment: additional non computer-mediated interactions may take place, all of which cannot be organized by the teacher;
- in places other than the specific learning environment provided: library, language resource centers, personal communications via the Internet, etc.

Managing the variety of these interactions is an impossible and certainly pointless task. However their existence must be acknowledged by the teacher and the institution when defining goals, as they will most probably influence the nature of learner output. The exposure to a large variety of language forms, styles and registers exerts unavoidable influences on the learner's final representations of the language.

Rather than the loss of standardized forms of English, these forms now co-exist with a wide variety of native and non-native varieties. The Internet is a site for language contact, as language users from around the world contribute pages and comments in many different languages and language mixes. […] This multilingual, multimodal combination of expression further expands the varieties of communication in which English plays a role…. (Chapelle, 2003, p. 20)

One of the consequences of such a linguistic melting pot as the Internet is that the language will evolve in ways that language teaching has not yet fully investigated (Chapelle, 2003).

Learner ⇔ Instrument Interactions

For Payne (2002), technology is essentially neutral: it is the way learners interact with it which impacts learning. The description we have given of the passage from the artifact to the instrument can be seen as an ergonomic translation of Payne's vision.

The desired outcome of students' interaction with computer technology is that they learn the content and that computer use fosters their willingness to continue with the online course. The major variables linked to learner-interface interactions included computer experience, students' perceptions regarding the technology, and access to technology. (Thurmond & Wombach, 2004)

In our ergonomic perspective, this is certainly the essential relationship on which the whole Human-Machine system is structured. As we mentioned in earlier pages, identifying its precise nature is a most difficult task because it is based on non-observable processes and remains highly dependent on the type of technology involved. Understanding the nature of these interactions implies observing online learner activity via monitoring devices. The markers on which such monitoring can focus vary significantly according to the theoretical standpoint.

In a constructivist perspective, for example, monitoring of all technical actions performed (clicks, time spent on activities, etc.) provides accurate description of the learner's interactions with the language. It does not however account for how the learner reconstructs the language materials and develops his/her interlanguage.

In a socio-constructivist/sociocultural perspective, these relationships can be observed from the angle of teacher-learner and learner-peer interactions. The data collected can be analyzed and interpreted both in quantitative (number, frequencies) or qualitative terms (text analysis of recorded verbal interactions).

In a cognitivist perspective, the data collected being limited to actions and behavior, interpretation in terms of learning strategies or mental processes will leave the door open to uncertainty.

Analyzed from an anthropotechnological point of view, the learner-instrument relationship can be described as follows:

The question is no longer to consider how a user interacts with his computer, but how an active subject using a software application as an instrument to handle objects can derive some personal meaning of these operations in the context of the activity. (Kuuti, 1992, cited in Rabardel, 1995, p. 52)

This approach is miles away from the more common one consisting in reproducing online,

what teachers and learners have been used to. It is clearly an ergonomic perspective insofar as it means reconciling different users' representations and expectations. The psychosocial dimension whose importance we stressed in chapter 2 is of major importance for the efficient organization of the learner-instrument relationship. At the same time this approach should alleviate the fears often expressed in relation to the instrumentation of the pedagogic act: the machine can in no way replace man in the pedagogical situation. Technological mediation does not mean the substitution of the one by the other. Quite the opposite, it implies their mutual reinforcement in order to facilitate the learning process.

The learner-oriented sub-system (Figure 17 in chapter 1) should ideally be organized along the lines figured in the first type of association described in Hollnagel's triadic model (Figure 8 in chapter 1). Instrumentation is justified by the desire to 'amplify' the final user's cognitive functions. The functions of technology consist in organizing input, organizing its interactions with the learner, and providing the latter with the necessary tools for his own reflection. In this light, the computer can be assimilated to the 'cognitive tool' outlined by Dieter Wolff:

This does not mean that the computer itself possesses inherent cognitive abilities, it simply means that it can do things which can aid the learner in his/her information processing and learning. (Wolff, 1997, p. 17)

Favoring users' appropriation of a learning space structured along these lines entails distinguishing between two perspectives: how to operate it (technical perspective) and how to use it (didactic perspective). Their coincidence determines the effectiveness of the whole system. The difference between the two corresponds to the passage from the artifact to the instrument (chapter 7). This passage is conditioned by the initial opposition between algorithmic and heuristic operations on the one hand, binary and synaptic operations on the other hand. This dichotomy stems from the more basic one between the unpredictability of an intuition-driven mind and the intention-driven mode of operation of the instrument. Organizing some kind of constructive interaction between so distant partners can only take place in the context of a task structured by a clear didactic intention. If models are indeed necessary to design such intention-driven tasks, the final responsibility of interpreting learner-language interactions is never the machine's, but the learner's himself. In spite of popular notions, the machine cannot 'learn'; responding to the learner's solicitations, retrieving information to answer questions, is not 'teaching'. It simply provides support to individual learning.

In order to stimulate constructive learner-instrument interactions, the articulation of the various sub-systems described in chapter 1 would ideally combine the basic functions of the computer illustrated in Figure 15 in chapter 1:

- trigger cognitive processes by offering problem-solving tasks (didactic and cognitive functions);
- support cognitive processes by offering access to a large array of online tools and references such as dictionaries, thesauruses, concordancers, etc. (informative function);
- monitor learner activity and progress for online tutoring and guidance (follow-up function);
- favor the smooth operation of the system as well as enrich verbal interaction and input (communicative function).

DISTANCE LEARNING CONTEXTS

Consistent studies on distance learning environments are not in great number, and the works of White (2003), and Lamy & Hampel (2007) are

therefore of particular interest. Distance learning courses have evolved considerably in the past twenty years and two broad paradigms now coexist.

According to White (2003, p. 159), traditional paradigms have emphasized independent learning carried out principally through well-planned self-instructional materials. High-quality, self-contained materials had to be designed and delivered in order to foster and maximize learner independence.

In courses referring to the merging paradigm, the role of collaboration is emphasized in affording control to learners in distance learning courses . Sustained teacher-learner and learner-learner interaction also foster autonomy. Autonomy is seen less as a matter of independence, self-reliance and learner training, than as the result of reflective interrelation, interaction and collaborative control within the context of meaningful and relevant learning experiences as described in chapter 4. As was seen in chapter 3, curricula and syllabi can be implemented with the collaborative contributions of learners. White (2003, p. 160) reminds us nevertheless that learners have varied needs and preferences for interaction and do not see interaction in their individual learning environments in the same way.

Studies on language centers (Candas, 2009) or on distance language courses (White, 2003, p. 162) show that simply providing opportunities for text-based learning on-site or on-line, even with adequate support, still raises issues of access, participation and involvement.

Types of Courses

Second-language distance courses can be described along a continuum between individual-based to group-based (White, 2003, p. 8). The range can vary from traditional correspondence courses to print-based course with electronic support systems. But the development of ICT has led to the implementation of multiple-media courses combining synchronous and asynchronous media including real-time e-chat, audio conferencing, and text-based materials sent electronically or by post. Language classes can also be delivered by satellite to multiple sites.

Teaching and learning can be synchronous and correspond to classroom teaching, tutorials and workshops in traditional settings, or asynchronous and correspond to learning centers or self-access centers. Similar problems, increased by distance, could be encountered as far as synchronous teaching is concerned. CMC facilitates interactions with tutors or learners (White, 2003, p. 54), but learner reticence is still felt (White, 2003, p. 56). Such facilitation is related to the possibility of discussions, faster transmission, progress enhanced by the contribution of other learners. Silent or passive participation remains an alternative which escapes analysis, and therefore tutoring remains ineffective in such cases.

As in traditional classes or resource centers (Candas, 2009), congruence between individual characteristics, the learning context and personal circumstances (White, 2003, p. 124) is not easy to attain.

White (2003, p. 130) quotes data that show how interrelated learner characteristics, distance language learning and the social, family, or work context are, in fact. The major concern is connected with the relationship of student progress with persistence, since attrition and drop-out rates are high (Albero, 2004). This will imply controlling or reducing the de-motivating causes that can be associated with academic, practical and/or affective factors.

In the case of asynchronous distance learning (White, 2003, p. 9), learning opportunities can be accessed at any time (print, video, CD-Rom, e-mail, computer conference discussions). Synchronous learning offers real time communication (telephone, chat rooms) which is more motivating since the response can be immediate if there is no time difference, but learners may be located in different time zones. Multi-synchronous learn-

ing is the third generation course model (White, 2003, p. 15) which provides greater flexibility, but increases demand on the teacher/tutor.

In the design process, depending on the context (contexts, in fact, since no two learners will be in a similar situation), the course designers will select the delivery tools following the path of least resistance and will see to supplementing the core.

Supplements

The basic courseware may not be sufficient to maintain perseverance, and White (2005, p. 48) reminds us that opportunities of interaction should be offered or suggested in learners' communities or on-line.

White (2003, p. 57, citing Salmon, 2000) suggests the following model of learning on-line through CMC:

1. Access and motivation: individual access and ability to use CMC is essential for participation.
2. On-line socialization: participants establish their on-line identities and find others with whom to interact.
3. Information exchange: participants contribute to course-related information.
4. Knowledge construction: course-related group discussions occur and the interaction becomes collaborative.
5. Development: participants look to more benefits from the system to help them achieve their personal goals, explore how to integrate CMC into other forms of learning and reflect on the learning process.

Similar models could be seen in self-directed systems (Candas, 2009).

Learner Supports

A common view of distance language learning (White, 2003, p. 169) has been that it presents the learners with an essentially limited experience of second language learning and that it provides fewer of the benefits and support structures than those that are available in classroom settings or language centers. The authors of this book do not think that classroom settings always provide adequate support services. Language centers have often been implemented with greater reflection on such services.

Accessible, high-quality support services and opportunity to gain feedback quickly are two features of distance language learning which contribute most to the integration process (White, 2005: 129). Learner support should be organized as a response to the individual learner rather than as a standard or uniform product (White, 2005, p. 170), in the same way advocated in the case of self-directed learning (Candas, 2009 or Duda, 2002).

Feedback to learners, varied opportunities to cater to the differences between learners (styles, rate of learning, etc.), and the provision of self-access components to address specific learning needs and interests, are identified as part of the support process. In the same way, the institution/course organizer also provides parallel support activities instead of merely providing teaching material and tasks.

Case for Learner Support

In many cases, emphasis is laid on the 'successful' implementation of distance courses with an almost exclusive focus on course development and delivery. Experience in self-directed systems shows that this will not be sufficient: ready-made course materials do not always meet the specific demand of each learner who may need supplements or a re-organization of the elements of a given course. More important than the actual

Table 1. Learner support

Functions of Learner Support	Scope of learner support Services
Cognitive Affective Systemic	Tutoring (pro-active and reactive); Study groups and centers, actual and virtual; Feedback on assessment of progress (product and process); Learning support (study and exam skills, seminars). Guidance and advisory services (motivational counseling included); Residential schools; Peer contact. Enquiry and admission services; Course/academic information and guidance.

material and tasks, what matters is the quality of student learning, and this requires individual response to each individual student (Duda 2002, Holec, 1981).

The requirements to ensure quality have been defined in the case of distance second language learning (White, 2003, p. 172):

- ensure adequate orientation to distance education for learners;
- ensure the commitment of tutors to learners (availability, responsiveness, thorough feedback on assignments);
- develop a system to facilitate reliable, frequent contact between tutors and learners;
- minimize learner isolation (on-site workshops, pairing with peers, advanced communication technology, such as CMC);
- ensure administrative, academic and personal support.

Such requirements are not very different from those of autonomous learning in resource centers (Duda, 2002), but they do not necessarily reflect the specific demands of second language learning as described in the previous chapters, since they could be applied to any field of learning. chapter 11 will be devoted to the special requirements of L2 distance learning and how they can be met.

Drop-out rates in distance education are often high, statistics show that there are limited means to avoid drop-out (Albero, 2004), and White (2003) stresses that this will make learner support vulnerable to criticism as far as returns on investment are considered.

Functions and Scope

Support is organized to maintain or increase learner motivation, develop learning skills, generate a feeling of belonging to the institution or course, and provide extra access to resources and administrative advice.

Table 1, adapted from White (2003, p. 177) shows the extent of learner support.

Functions of Support

Cognitive functions (White, 2003, p. 178): these are related to the need to enhance and assist the learning process and the teaching-learning relationship (Figures 16 & 17 in Chapter 1). They include negotiating learning targets for the week, identifying materials for each learner based on individual needs, advice on learning routes and language learning strategies, feedback on performance – simple error correction offered on the spot, evaluation and correction of pronunciation and intonation, summary of errors and feedback at end of interchanges, evaluation of progress as a whole. These functions can be addressed through asynchronous discussion lists (for course-related

questions), personalized feedback on submitted work (e-mail), oral practice (phone sessions), or even snail mail.

Feedback (White, 2003, p. 187) plays a critical role and should be given with full knowledge of the theoretical background of L2 teaching and learning research. Handling feedback is more delicate in the distance context. As face-to-face interaction is limited, there is a greater likelihood of misunderstandings between learner and tutor.

Feedback should be expressed in terms accessible to the learner (chapters 3 and 4) and be process-oriented (techniques and strategies) as well as product-oriented (quality of output, adaptation to expected level of achievement). Chapter 11 will further develop these aspects.

Tutor training in that part of their role needs to be studied carefully and adapted to the specific context of each course, and often of each learner.

Feedback on the learning process should include positive comments as well as advice, avoiding negative comments that may be more counterproductive than traditional encounters. New techniques should be advised when necessary, and adapted additional work proposed (specific micro-tasks to focus on particular problems, or other macro-tasks better adapted to the learner's problems) and justified (chapters 4 and 11).

Peer-to-peer feedback is now seen as a very positive source of feedback from peer interaction (see the role of scaffolding in Rees, 2003). This often has to be organized by the course tutors (White, 2003, p. 191).

Affective functions can be defined by referring to strategies (Oxford, 1990) for example. Tutors will have to reassure and praise, and can do so by e-mail or phone calls (more personal and private). They can pay attention to the level of motivation by assessing the quality of assignments and the frequency and quality of interactions (forums, chats, etc.). They must also maintain positive social exchanges at the beginning and end of tutorials, etc.

Administrative functions: learners must know how to obtain the information regarding admission, certification and the running and academic content of the course (White, 2003, p. 179).

Sources of Support

Distance language learning is necessarily a lonely pursuit, at least most of the time. However contact and support can be maintained in different ways (White, 2003p. 181):

- the teacher and the institution;
- peer support, that must be planned (chat rooms, discussion groups, scaffolding in common tasks when they can be organized);
- face-to face study groups, which are not easy to implement;
- mentoring;
- letters and e-mails;
- native speakers, who can provide motivating realistic support (tandem learning, e-mail, chat, forums, etc.);
- partners, family and friends can provide support that can be suggested by course tutors.

Learning to Learn books, e.g. Ellis and Sinclair (1989) or Narcy (1991), provided this information in the initial years of self-directed learning.

New Forms of Learner Support

Among the forms of support that have been described above, the most recent ones may prove to be more effective than expected (White, 2003, p. 183). Many learners prefer e-mailing to phoning which is more frightening especially if the tutors or the support services cannot speak the learner's native language. However e-mailing can also prove a source of misunderstanding (cultural and language problems that can be carefully avoided by a proactive study before the course starts).

Computer conferencing proves an excellent and popular forum for interaction and feedback.

Regularity of contact, punctuality of feedback, well-planned timing of assignments, a little measure of non-threatening intervention (Demaizière, 2003) will help. Learners need interaction directly related to their problems and not merely information on what can be done though providing information is less time-consuming and will be the only possible alternative when learners remain silent or passive. Once again self-directed learning provides descriptions of practices that can be adapted to distance learning.

Maintaining a Learner-Centered Approach: Limitations

Support must be appropriate in terms of access, added value and congruence (White 2003, p. 184), which means that access must be easy, quick and inexpensive, the learning process must be made simple through it, and it must be adapted and adaptable to the learners ways of organizing their work.

White (2003, p. 186) reminds us that tutoring that is related to counseling (Curan, 1972) may be misconstrued by certain students in cultural contexts where teachers are expected to teach, and tutors are seen as teachers. Such attitudes should be measured at the beginning of each course (questionnaires, forums, discussion groups, etc.).

Distance and Contexts of Delivery

Contexts of delivery have an invisible influence on how distance courses are perceived by learners. Contrary to other forms of learning, distance learning implies coping with a multiplicity of places, the availability of technological facilities, the familiarity of learners and tutors with these facilities, the different educational cultures. Information on all these parameters may be lacking in the initial stages of a course, and means of overcoming this need to be implemented. Isolation is the major characteristic of these contexts and technology and pedagogy can provide satisfactory ways of reducing it once the characteristics of the various contexts of delivery have been described.

Interaction at a Distance, Collaboration and Cooperation

Interaction has been shown to trigger learning processes (chapter 3), even if learning is also an intrapersonal phenomenon, organizing it as a purely individual isolated pursuit will be successful with very few people. Technology provides more and more facilities that make interaction at a distance easier and more convincing. CMC provides (White, 2003, p. 52):

- a means of support;
- a sense of being part of a cohort of learners;
- a way of learning from others' questions and responses;
- a source of alternative perspectives;
- opportunities to ponder the points raised and to have time to formulate a question or reply;
- access to earlier discussions, available for review;
- variety;
- motivation to keep going;
- a voice for learners within the course, under their control.

This does not mean that learners will be able to take advantage of these facilities. Tasks should be designed and organized in such a way as to lead learners to see the point of interacting with other learners or with tutors.

Lamy and Hampel (2007, pp. 64) see cooperative learning as a division of the work among the participants, whereas collaboration requires a mutual engagement in a coordinated effort to solve the problem together. They describe an obvious link between collaborative and coopera-

tive language learning, the notion of teacher as facilitator and the autonomy of the learner. Such a position is related to Vygotsky's conception of learning as problem solving under adult/teacher guidance (tutoring in our case) or in collaboration with more capable peers (Vygotsky 1978, p. 86). This again can be related to practices in self-directed learning (Benson and Voller, 1997) and adapted to distance contexts and language learning task specificities.

Interestingly White (2003, p. 161) stresses the fact that collaborative work develops accountability and interdependence. Autonomy is now seen to result from epistemological responsibility, capacity of making reasoned decisions and acceptance and understanding of interdependence (Barbot & Camatarri, 1999).

Collaboration and cooperation lead to positive results:

- academic benefits (critical skills, involving students in activity, improved classroom results, modeling problem solving techniques, personalizing large lectures, motivating students);
- social benefits (social support system for students, building diversity understanding, positive atmosphere, developing learning community);
- psychological benefits (increasing self esteem, reduced anxiety, development of positive attitudes toward teachers) (White, 2003 and Chanier, 2002, for example).

The academic benefits will be sustained by tasks with adequate instructions and contexts incorporating the specific needs of language learning (nativization, noticing and deep processing—chapters 3 and 4).

Cooperation is more cognitively and socially oriented via a set of known techniques. It requires more structure and prescriptions, it favors interdependence, accountability, teamwork, roles, while collaboration leans towards acculturation to knowledge communities. It favors development of ZPD, cognitive apprenticeship, acculturation, scaffolding, situated cognition, reflective inquiry, and epistemology (Lamy and Hampel, 2007, p. 66). The attractiveness of collaboration should not disguise the fact that collaborative work may be conducive to very successful social and cultural results that conceal unresolved denativization problems when instructions and feedback have not been thoroughly planned. Collaboration requires a number of capacities, and Lamy and Hampel (2007, p. 67) refer us to Mangenot and Nissen (2006, p. 604). Some form of learner training can facilitate the recourse to collaboration and we will see that such learner training is often more easily accepted by the learners when it is part and parcel of the tasks themselves (the need for collaboration and adapted capacities arises from task instructions).

Lamy and Hampel have drawn a list of the causes for failure:

- *learner's current level of ICC (intercultural competence);*
- *learner's motivations and expectations;*
- *teacher-teacher relationship;*
- *task design (thematic content, sequencing);*
- *learning matching procedures;*
- *local group dynamics;*
- *pre-exchange briefing;*
- *technology (tools, access);*
- *general organization of course of study;*
- *prestige of language and culture* (2007, p. 68).

This list can become a check-list before implementing collaborative tasks. The learner training could include a socio-affective reflection on how to approach interaction in CMC (White, 2003, p. 63) by developing affective and interactive responses such as adapted expression of emotions, use of

humor, self-disclosure and ways of compensating for the absence of visual cues such as nods, gestures and eye contact.

Time Constraints

White (2003, p. 30) underlines the effects of time constraints. Collaboration and cooperation are difficult when the public is dispersed. Timing is complex when synchronous tools are used and should be handled carefully taking socio-cultural data into account.

Collaborative and cooperative tasks, but also individual time should be implemented so as to reduce these time constraints: browsing the web, interacting in computer conferences and working in groups online and getting to use all the potentialities of a personal computer can be time consuming and should be planned to reduce complexity of action to an acceptable minimum.

Scale of Courses

Our experience (Narcy-Combes, 2005) has shown that if 'small is beautiful', large courses do not necessarily require a rigid organization. If tutoring is well-organized and if tutors are well-trained, heterogeneity and large numbers can be catered to by a flexible approach to task design (choice of sources left to learners) and by offering a well-constructed virtual resource center as will be shown in chapter 11.

Learning Sources

Courses have traditionally been seen as consisting of carefully constructed pre-determined content often proposed in highly directive ways, programmed learning (Brodin, 2006) being the most extreme but often still pervading case.

Linear course models tend to be teacher-directed and have potentially negative outcomes as detailed by White (2003:204):

- Specially packaged materials set a learning path and learners follow a perceived 'authority route' through the materials. Bertin & Annoot (1997) however note that only the more advanced learners may resent this linearity, while less advanced ones seem to enjoy the degree of implicit pedagogic guidance it offers.
- In following authority route, learners may be less responsive to their own learning needs, preferences and skills and won't build epistemological responsibility.
- More highly structured procedures and materials may suggest that there is a single, right way to learn and confirm beliefs.
- Pre-packaged materials may shift the focus of curriculum decision-making away from the learners.
- Learners may be reluctant to go beyond the course materials to explore other sources, not endorsed by tutor.
- Packaged materials may lead learners to the view that the object of learning is full mastery of the 'texts' in the course.

We will not go into the diverse types and the multiplicity of sources available here: we will rather underline that course construction can be more learner-centered and support the notion of learner as course producer, sometimes called 'the enhanced course model' (e.g. Jezegou, 2002, White, 2003 or Narcy-Combes, 2005). This perspective requires trained tutors that can conceptualize the content of the materials in terms of their learning potential for each specific learner (points to be noticed, subsequent work to be suggested, etc. - chapter 11). Collaboration and cooperation can be organized in an ecological perspective (Van Lier, 1996), learners being collectively in charge of constructing the course. This will nevertheless require careful preparation, planning, monitoring and feedback to respond immediately to the unexpected demands and problems that arise from such courses. As in self-directed learning in

resource centers (Duda, 2002), learners are encouraged to select their own learning paths through the sources. They can make decisions about (1) texts or documents they want to base their work on, (2) ordering these texts and documents, (3) in which they are deployed, (4) the respective importance of these texts and documents, (5) the combination of these texts and documents. Such an approach corresponds to the position that there are different complementary ways of learning L2, as self-directed learning and language centers have long advocated (Holec, 1981). As this approach implies a more complex course structure (White, 2003, p. 206), it may require initial training.

Learners as Course Producers

In a course based around multiple sources for learning, which can be provided in a (virtual) resource centers, learners have the opportunity to select their own paths through the material according to their preferences, progress and need for further practice and revision (White, 2003, p. 209). Learners see different roles to the sources; they prefer certain sources for initial input and do not always realize that the different sources have different demands. Negotiation with the tutor may facilitate coherent decisions. Learners appreciate selecting the sources, even if it means they have to monitor and assess not only their progress, but also the appropriateness and potential of the sources they have selected, which can be done with the tutor or peers (Narcy-Combes, J-P. & Narcy-Combes M-F., 2007).

Development of Course Content

There is an obvious need for extensive planning at the initial stages of a course, before the learners actually join it. Planning will be facilitated by references to Common European Framework of Reference level descriptions (in the case of European-based courses) and by references to well-known curricula and syllabi, especially those based on social situations or actions or professional or academic situations (chapter 3). Sequences of tasks can be devised imposing complex choices in relation to selection of sources, media and delivery options. Team work will facilitate the development of course content, but team work may prove difficult in some cultural settings, action research data from French high schools (Narcy-Combes, 2005) have shown that team work was one of the two most serious negative points in innovating practices in France for instance.

The team will have to determine how static and/or fluid the content will be. They should bear in mind that fluid content may make learners feel more responsible for their own learning. This, however, implies that learners have epistemological responsibility and the capacity to respond to social interaction in the development of the course. White (2003) sees fluid content as less economical. This may not be the case when learners are in charge of selecting their materials and of choosing their tasks. Tutors, however, may have a heavier load of reactive feedback in that case.

White (2003, p. 203) distinguishes between invariant content (stable aspects of course) and variant content (part of course that can be modified). We will see in Section 3 that, when this is possible, macro-tasks can be either static or fluid elements of the course, whereas micro-tasks will be invariant, even adapted for use in different courses when available from a (virtual) resource center. The selection of which micro-tasks to perform, however will be fluid (related to each learner's specific needs).

A resource center combining a multiplicity of learning sources is then a very adequate solution, since teachers cannot always ensure maximum fit between individual learners and course content. If tutors or learners can interact with the content during the course, the learning material can be made more appropriate and more responsive to the expressed or emerging needs of learners. This approach offers more flexibility but tutor and learner training such as advocated

by Hubbard (2004) or Blin (2004) will have to be maintained, and more research is needed to confirm its validity. Organizing a course then is a question of constant adaptation to the learners' needs as they emerge. In many contexts this will not prove feasible and course production will be organized in a more linear fashion. Finally, this type of organization assumes the existence of a regulation sub-system (Figure 19 in chapter 1) in the learning environment.

Stages in Course Production

White (2003, p. 198) describes them as follows (including our comments):

1. Preliminary draft syllabus (situations, functions, topics and linguistic elements to be studied, linguistic elements will be a consequence of the choice of the first three points and should not be a priority in the planning – chapter 3).
2. Drawing up of the specifications of audio-visual materials, prepared by the academic team and closely discussed with the audit team.
3. Gathering of authentic (audio-visual) documents in L2 countries or on the Internet.
4. Editing the video resources and pre-selection of audio sources.
5. Producing a refined version of the syllabus, based on the linguistic exponents present in the audio-visual materials gathered. This traditional approach can profitably be given up for a task-based approach that will build the sequence of tasks according to the expected difficulty of the tasks (chapter 11). An alternative would be to develop a resource center with the micro-tasks that can be expected to be necessary.
6. Writing the course books/documents and reviewing the drafts by the course team.
7. Producing activities on CDs (with extracts of authentic audio and scripted activities recorded in the studio). In a task-based approach, this will become the organizing the tasks and resources on the one hand, and the producing of the un-existing micro-tasks on the other hand.
8. Editing the written materials. This involves editorial queries to the academic team, production of artwork, book design and printing. This stage will be adapted to task-based course development.
9. Producing an assessment strategy and assessment materials for the course in the form of tasks in task-based courses (see chapter 11).

Course Production Team

In a classroom, there is no one but the teacher and the learners and no one analyzes the different roles the teacher plays. The literature of self-directed learning has described the new variety of roles the teacher can play, stressing the fact that no teacher will actually play all the roles. This is applicable to distance learning (Pothier, 2003 and Narcy-Combes, 2005) which, especially in large-scale courses, definitely makes it impossible for one person to play all the roles. No one can be subject expert, course tutor, teaching consultant, editor, member of the production team, online consultant, media specialist, and resource specialist, to quote White's list (2003, p. 198). Teamwork will therefore be the rule, which may necessitate specific training in some contexts.

Media and Delivery Options

There are many well-known delivery options: print, audio, video, computing, face-to-face, and more and more technologies are available (from now 'traditional' TV, radio, phone, audiocassettes, videocassettes, CD-ROM, e-mail, to more and more sophisticated forms such as computer conferencing, video conferencing, internet, computer-based multimedia, WWW, VLE).

Table 2. One-way or two-way technology applications (adapted from White, 2003)

Media	One-way technology applications	Two-way technology applications
Text	Course units; supplementary materials	'correspondence' tutoring
Audio	Radio programs, cassette programs	Telephone tutoring; audio conferencing
Television	Broadcast programs; cassettes programs	Interactive television (ITV); video conferencing
Computing	CALL; multimedia	e-mail; interactive databases; computer conferencing

What matters more than the actual technology is the need to provide feedback and interaction and flexible course design to cater to specific needs. A course must respond to all students with their differences. White's distinction (2003, p. 201) between one-way or two-way technology applications can prove very useful, as it highlights the limitations of one-way technology applications which must be preemptively complemented if they are the possible choice (Table 2).

Online Materials

In their study of online learning materials, Bertin et al (2005) have shown how the resources vary according to how they reflect five main functions:

- the referential value of the materials, i.e. the nature of disciplinary contents;
- the stimulation of learning/cognitive processes, i.e. the relationship between these processes and the technological devices retained;
- the facilitation of learner use of the materials;
- the presence of feedback facilities;
- institutional constraints.

Referential Value of Materials

Online materials are meant to present disciplinary contents to the learner. In the case of language learning and teaching, the notion of contents is related to the definition given to language (chapter 3) as well as to the question of task design (chapter 11).

The relationship established between technology and the presentation of the language varies significantly from one context to another. One possible motivation for placing materials online is to make them easily available, irrelevant of time and space of work by the learner. The digital document replaces the printed paper traditionally used in the classroom situation. This perspective remains close to the mail-based distance courses. With the development of the task-based approach, this type of material tends to disappear, as the referential function of materials is less important than the communicative and noticing activities. Contextual considerations (local habits, variations in manager perceptions of distance learning and the computer) may however influence design options in this respect.

Stimulation of Learning/ Cognitive Processes

Another motivation for placing materials online is the desire to enhance pedagogic mediation through technological mediation. The materials which privilege this approach offer radically different characteristics from those mentioned above. They favor the development of skills and competences rather than the transmission of knowledge. They tend to make full use of the potential of technology and to totally reconsider the nature and forms of the materials. This means a high degree of hypertextuality and dynamic links and resorting to online interactive activities.

Interactivity can be used for two main purposes:

- Construction of knowledge and/or competence: materials/tasks are organized around a central document complemented by a varying number of secondary or reference documents available either by a menu or by hypermedia links. Such materials can be related to the hypermedia-based constructivist approach described by Tricot & Rouet (1998): the heuristic construction of knowledge and competence by the learner, as opposed to the traditional teacher-directed perspective. By activating the links available on the screen, the learners experiment with the materials at their own pace, according to their own objectives. Learning a language cannot however be limited to accumulating information but is a matter of organizing and processing this information (chapter 4). The virtual contents present in the hypermedia materials must be formalized and organized with methods which the learners must gradually develop, as described by cognitivism and these types of materials may integrate modules devoted to learning to learn at a distance.
- Interactivity in these types of materials is also used to evaluate the learning process (formative evaluation). The type and number of interactive pre-organized activities integrated in the materials (such as in micro-tasks, for example) vary significantly from one context to another and may either be computer-mediated or offline. In the latter case, the learners perform the task through more traditional means and may send their work to the tutor by email.

Facilitation of Learner use of the Materials

To be pedagogically efficient, materials must be easily assimilated by the learner, both in terms of how to use them (functional ergonomics) and in terms of how to identify their objectives and methods (visual and cognitive ergonomics). As the major originality of distance learning is the space and time discontinuities imposed on the teacher and the learners, the former can no longer respond immediately to the latter's solicitations. Directions must therefore be clear and explicit, even redundant, since the learner will rapidly abandon the activity if faced with difficulties of comprehension of the learning space. More elaborate materials include proactive aids or descriptive modules for the various activities provided.

There remains an apparent contradiction, still to be alleviated, between the necessary simplicity of use required from functional ergonomic principles, and what we call the *pedagogic depth* of the materials, i.e. the nature and the functions of the interactions generated by the learner's action. The more elaborate this response, the more difficult to keep the system simple and easily comprehensible.

Follow-Up and Feedback

The attention given in the materials to follow-up and feedback, whatever the forms, varies significantly from one context to the other. The same differences can be found here as those noticed above for integrated interactive activities.

Two main types of follow-up seem to emerge:

- Teacher-controlled follow-up and feedback, submitted to the variations of work schedules between learners and tutors.
- Machine-controlled follow-up and feedback, whose aim is precisely to compensate for the problems generated by asynchronous learning/teaching moments. This type of follow-up, based on computer pro-active monitoring, remains largely experimental.

Institutional Factors

As seen in chapter 8, these factors contribute to defining the context in which the online materials are set and for which they were originally designed. They include decisions regarding pedagogic objectives, human, financial, and technological resources, etc.

By considering how the various materials meet the five factors mentioned above, Bertin et al (2005) have suggested they can be categorized along an axis ranging from a 'simple' model, which tends to see technology as the means to make (traditional) materials more easily available, and an 'elaborate' model, for which materials are totally revisited in the nature, functions and forms in order to match the potential of the technology.

SYNTHESIS

How has the chapter answered the questions raised in the introduction?

- How can the various types of interactions between the five poles of the model be envisaged? The authors move away from traditional analytical descriptions and consider the poles of the didactic ergonomics model in a systemic perspective. This means first identifying the interfaces between them, i.e. the places where significant interactions take place, and considering possible paths to the understanding of the nature of these interactions. It then means considering how these interactions retroact on the nature of the poles and outlining the directions in which the various actors' roles evolve.
- What new issues emerge from this review? Appropriation of the technology by the various actors takes place on a variety of levels (technical, cognitive, institutional…). Instrumentation of the language learning process and the new roles it involves for each actor has important consequences on contexts. More specifically, teacher training is affected and new needs emerge for learner training. This means distinguishing between and combining functional ergonomics (how to use the software) and cognitive ergonomics (how to make sense of the materials and the environment for language learning).
- How can this apply to distance learning contexts? Distance learning courses design is more and more based on either independent learning carried out through teacher-organized online self-instructional materials, or on collaboration through a growing use of Computer-Mediated Communication. The chapter shows how these two options impact the various stages of pedagogic mediation in distance learning contexts.

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Section 3

Operating the Model

Chapter 10
Designing a Distance Language Learning Environment:
An Engineering Perspective

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OBJECTIVES OF THE CHAPTER

This chapter will try to answer the following questions:

- How can the didactic ergonomics model be operated?
- What are the basic principles of an engineering approach?
- How can the innovation process be supported?

The principles introduced in chapter 8 represent a number of guidelines to operate the didactic ergonomics model in specific contexts, which the present chapter will now develop. The didactic ergonomics model outlines the complexity of the (distance) computer-mediated language learning situation affecting the three dimensions of mediation (pedagogic, technological, distance). This complexity makes it even more necessary to organize the reflection on the design and implementation of such environments. A methodology based on engineering seems to us the most appropriate one to operate our model.

The first part of this chapter will introduce the four main phases of the engineering approach. It is sometimes perceived as too procedural and disincarnate. To alleviate this criticism, in the second part focusing on its implementation, we will suggest a complementary action-research-training program which can offer a reasoned and operational means to support the introduction of innovation in a specific context.

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THE ENGINEERING PERSPECTIVE: A METHODOLOGY

Our presentation of the engineering perspective for language learning environments design and development will be mainly based on T. Ardouin's description (Ardouin, 2003). He defines training engineering as a perspective in which the course designer must use appropriate methods to analyze, design, implement and evaluate actions or learning environments, taking into account the context and the actors involved (Ardouin, 2003).

To this definition we will add… 'and ensure the effectiveness and reliability of this environment'.

Three levels of engineering are commonly distinguished, which we will consider in the following pages in relation to computer-mediated distance learning environments.

The 'political level' is where strategy and decisions are formed and where educational policy is defined. The governing body places the order with a contractor, based on requirements to be formalized or on a project to be defined with experts.

The 'training engineering' level is the organizational level. It structures the project into environment and actions taking into account the political objectives, the context and its constraints. The contractor is fully or partly in charge of the development. He defines its overall architecture and the various stages of its implementation according to specifications. Needs analyses, definition of actions and environments, planning, management plan, logistics, coordination, and evaluation are all operated at this level.

The 'pedagogical engineering' level is the pedagogic, didactic and operational level, where prerequisites for the course, tests at entry, etc…, are defined. Progress, teaching and learning methods are also identified in relation to the constraints which have been identified and the specifications. Specifications will concern content, support and materials design as well as evaluation and validation methods.

Training engineering is therefore situated at the interface between political engineering (strategic and decision-making level) and pedagogical engineering (pedagogic level). The main goal of engineering is to optimize investment and to enhance efficiency: training engineering is the means to reach this goal. It makes it possible to design the 'training architecture' as well as to make teaching more meaningful by situating it within its larger socio-professional context.

Four main phases of engineering are generally distinguished:

1. course needs analysis;
2. learning environment design;
3. implementation;
4. assessment.

As this book focuses on the theory and principles of distance learning environments design, we will mainly develop the first two phases.

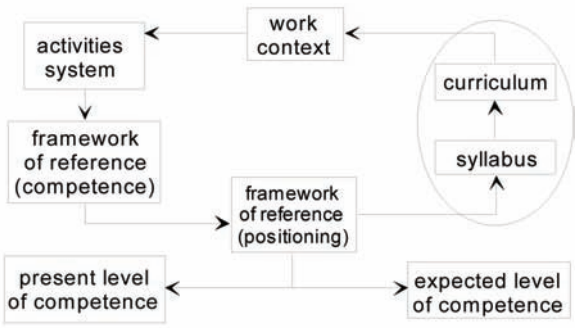
Four general principles guide the engineering perspective:

- needs do not exist as such but are socially and historically constructed in a specific context (Barbier & Lesne, 1977);
- assessment issues should be thought of together as early as the design phase;
- specifications should be elaborated (objectives, organization, progress, evaluation);
- the actors will only feel involved if they contribute to the project from its early stages.

Needs Analysis

This phase is of major importance and forms an essential characteristic of the engineering approach. It constitutes a critical condition for its success. It corresponds to the analysis of the demand and of its context in order to get a clear understanding of the environment, the socio-professional setting, the objectives and stakes of the order.

Figure 1. Engineering and needs analysis



Course needs do not exist as such and are defined by the gap existing between the expected level of competence and the actual profile of the learners. This means that learners should be positioned at entry as illustrated in Figure 1.

The work context represents the socio-organizational environment of the project, e.g. a university wishing to develop distance language learning courses for a specific public.

The activities system refers to the work reality of the targeted public and contributes to answering the following questions: what is the core activity? What are the various activities required by the process?

Distance and/or computer-mediated language learning requires the learner to master the specific tools, to work autonomously even when some degree of guidance exists, to select appropriate materials and methods, to organize peer work, etc. What appears to emerge is a new type of learner activity and learner competence. Identifying this competence entails listing the knowledge, the skills, and the qualities required by the activity, which are necessary to construct the framework of reference for competences. In the case of the L2 teacher, this framework of reference can draw on existing frameworks, such as the Common European Framework of Reference for Languages, for example (see previous chapters). These will have to be amended to account for the specificities of the given context (work situations, institutional policy orientations, etc.).

It then becomes possible to place the prospective learners in this framework of reference in order to measure the gaps between this framework and the actual competences of the target public.

Once this analysis has been completed, the designer can specify the expected operational objectives, and formulate these in terms of expected results. The draft project is gradually built and includes:

- the identification of the context;
- the main orientations of the project;
- the schedule of the various intermediate steps;
- the organization pattern;
- the definition of human, technical, material, and financial resources.

The second phase of the engineering approach can be envisaged.

Designing a Contextualized Learning Environment

The gaps observed between the expected competences and the competences targeted by the learners outline the competences to be developed by the learning environment. The latter competences form the framework of reference which will then have to be translated into contents and/or tasks. The informed teacher can then devise the most appropriate teaching/learning strategies to reach the targeted competences or levels of competence.

The contextualized learning environment project will therefore include:

- the general as well as the operational objectives of the environment;
- the list of the actors involved in the project;
- the overall organization of the environment;

- the development schedule;
- the necessary and available resources entailed by the project;
- the expected results (in qualitative and quantitative terms);
- the detailed description of the assessment procedures at the various steps of the project (including criteria and modes of assessment);
- the final assessment.

These items constitute the specifications of the project integrating complementary actions which meet the needs outlined and take into account resources and constraints. Basically, the engineering approach comes down to two main phases:

- the investigation phase which we have described in the previous paragraphs, made up of the analysis and design steps, leading to the final specifications;
- the implementation phase, which we are going to develop in the following pages, made up of the actual implementation and the assessment steps.

The responsibility of the project leader (or steering committee) of the project is to coordinate and monitor these four steps.

Implementing and Assessing the Learning Environment

We will not here present the various steps to be followed when implementing a pedagogical and didactic engineering approach to distance learning. These specific dimensions will constitute the essence of chapter 11, devoted to the pedagogic consequences of our approach. The present description will bear on the preliminary steps of context analysis and on the identification of the learners' needs, starting with the general principles which can guide implementation and assessment. These principles remain valid whatever the context of application.

The distance learning environment advocated in these pages is a hybrid – or blended – one[1]. It combines in different degrees moments of autonomous online work and face-to-face moments in the beginning, during, and at the end of the course. Technology is used to support each of these different moments. In our theory- and research-driven model, this approach corresponds to the integration of the following dimensions:

- the psychological dimension of the learner;
- the psycho-sociological interpersonal interactions between peers;
- the psycho-sociological interpersonal interactions with teachers, tutors, and the administrative or technical staff;
- the communicative dimension of the technology.

Steering and managing the learning environment consist in organizing internal and external partnerships, recruiting the required staff, coordinating a pluridisciplinary team and the various parts of the project. Management activities include:

- steering: management, monitoring and regulation of the project;
- regular adaptation of the resources to the goals and processes;
- material and human logistics;
- optimization of work methods and coordination of actions;
- development of logbooks;
- pedagogic, organizational, and financial follow-up.

Communicating on the project and between the various participants requires the creation of a steering and monitoring committee. Indeed, an

engineering approach cannot be thought of as the technocratic, procedural, and dehumanized implementation of authoritative directions. It should take all possible actors into account. The above-listed activities will contribute to the assessment and regulation of the project both in the course of its development and when it comes to an end.

What type of assessment should be considered? To try and answer this question, we should first recall the four main types of assessment generally acknowledged.

1. Assessment for regulation refers to in-training assessment. It is meant to control the on-going process on the pedagogic as well as on the organizational levels.
2. Summative assessment is used for certification or direction purposes and corresponds to the evaluation of the course. In other words, it is meant to check the level of competence of the learners at the end of the course.
3. Final evaluation aims at assessing the environment by analyzing the way it is implemented, using coherence, efficiency, and pertinence criteria.
4. Assessment by confrontation to (professional) target situations, aims at evaluating how the effects of the course or environment meet their objectives. This type of assessment is used to study how the course or environment may evolve.

These four types of assessment will be used at one moment or another in a distance and/or computer-mediated learning environment.

To sum up, this second phase includes the implementation of the environment, its management, monitoring, and assessment. While the first aspects of the concrete implementation of the environment will be developed in the next chapter, we will here focus on the management of the environment and of innovation as well as on the modes of assessment. Indeed, training engineering has to be adapted to the case of distance learning because the traditional management of a learning environment is further complemented by the management of the innovation linked to ICT integration in the various contexts.

THE ENGINEERING PERSPECTIVE: IMPLEMENTATION

Before going into the details of distance learning environment management in the last part of this chapter, we should first raise the question of what exactly should be managed. Implementation of the project involves several distinct directions which the project leader (or steering committee) will have to manage simultaneously. We will successively examine the following questions:

- How to analyze the context?
- How to support innovation through an action-research training program for and with the teachers and tutors?

Analyzing Context

The complexity linked to the notion of context requires a systemic sociological analysis drawing on the concepts of strategic analysis (chapter 8). This approach is backed by Basque (1996), who notes that according to several authors such as Fullan, Miles & Taylor (1980), a systemic vision of change facilitates the dissemination of innovation. The systemic approach stresses a vision of education as a series of interrelated sub- systems and as the sub-system itself of a wider system constituted by the educational community, its political and socio-cultural context, etc. All these (sub)systems are interdependent so that the modification of a single aspect of one may prove difficult to implement or may impact the others. Often, educational reform projects failed because of a lack of attention granted to the wider systems (cultural context, community at large, etc.). It is increasingly advised to plan

several interrelated interventions and to develop a coordinated comprehensive and global approach when introducing innovation in a given context. Moreover, the systemic approach acknowledges the need for change in the attitudes and mentalities of the various actors in this context. What is therefore at stake is not a more active part played by technology in education, but a modification in these actors' perceptions of the technology and of their own roles (Carr, 1996, pp. 16-20).

Concretely, this means interviewing a wide variety of actors, from decision-makers down to pedagogic secretaries, as well as teachers, technicians, etc. These semi-directed interviews will yield the qualitative data required to outline their perceptions and representations of the following:

- the context, together with its constraints and resources;
- their own roles and their evolutions;
- the internal and external communication system;
- then (and only at the end of the interview) the specific social innovation under consideration.

Analyzing this data makes it possible to establish a socio-organizational diagnosis of the initial context as recommended by Basque (1996, p. 4). Citing Fullan (1982, 1991), she advises the initiators of ICT integration to avoid any ready-made idea on intervention strategies. These strategies should only be elaborated once context analysis has been completed for the given environment. This preliminary needs analysis also constitutes the first step of Hall's (1973) model of innovation dissemination. This step helps develop a consensus on the objectives of change and on the need for external resources. It also contributes to identifying the initial constraints. In the same way, the first two steps of Chekland's (1981) model consist in clarifying as much as possible the nature of the context and the actors' representations of this context (not only what they think about the specific innovation envisaged).

In the systemic socio-organizational perspective, this analysis opens onto a fully-documented description of the context, including:

- the policy-makers' orientations;
- the institutional resources and constraints in terms of equipment, human resources, budgets, available pedagogic materials, and networks of internal as well as external actors;
- the needs and projects of the institution(s) involved in the innovation;
- the actors' needs (learners, teachers, and all other participants).

This wide-ranging consultation should encourage the free expression of the actors' representatives, thus enhancing their motivation for the common construction of innovation. Deschryver supports this strategy and stresses the importance of an actor-led innovation strategy based on a systemic needs analysis in the institutions concerned: specification of the various dimensions of the system, of their respective characteristics, of its goals and objectives, and of the variables of the process (resources and constraints). Thus, the strategy of innovation integration is defined with its actors and includes decisions as to the means of its regulation (Deschryver, 2000, p. 5).

Integrating innovation cannot be a top-down process but must be negotiated with everyone from the very first steps. Several actions may be taken to favor this process, and providing times and places available for team discussions will be especially beneficial to the creation of a positive atmosphere. Thus, regular meetings focusing on practices, problems and solutions may significantly help teachers on the difficult path to change. This suggestion however presupposes a minimum stability in the teams. Another beneficial factor, when feasible, is the opening onto other contexts where innovation takes place. The different con-

texts mutually benefit from such exchanges by outlining convergences and specificities, and by reflecting on the conditions of transferability of a given innovative practice.

Still another facilitating factor is the instauration of collaborative work with researchers who can manage and coordinate the workgroups on practices together with teachers. It then becomes possible to capitalize on experience, on scientific evidence and, eventually, to identify new directions for research, thus bridging the gap between theory and practice. Such exchanges may also point to new needs for training as innovation develops. This organization entails planning the meetings and providing the necessary financial resources for training if the need for it emerges.

Ensuring institutional support is a fourth asset in the implementation of innovation.

Teachers also feel that there are not enough incentives for using technology. Especially at universities, where tenure requirements often focus on research, faculty prefer not to take time away from their research to incorporate technology into their classes. (...) Administrative support is also a large factor in determining teachers' attitudes towards computers in the classroom. If teachers or faculty do not feel supported by their colleagues and administrators, they are less motivated to learn about or use technology. (Ducate & Arnold, 2006, p. 8)

This support may take different forms: incentives, moral or material support, reliable equipment, access to technological resources, training budgets, support to communication or publications in professional or even scientific journals…

It if the administration is not supportive of teachers using technology, if they do not realize the work involved in using technology, and if they do not provide incentives, then teachers have little motivation to use their valuable time creating materials and learning about new applications and how to use them. These incentives could include salary bonuses, credit towards tenure, or time off to develop or learn about technological applications. (…) Administrators, then, need to be both examples of technology users as well as sponsors in a variety of ways.

In addition to receiving incentives for using computers in the classroom, teachers should implement different plans to save time when developing materials.

Finally, also relating to efficiency, Cuban (1999) suggests that the administration consult with teachers before investing in technological applications rather than allowing the latest trend or most popular ideas to drive their decisions (Ducate & Arnold 2006, pp. 10-11).

Finally, the availability and support of pedagogic staff as well as computer technicians (general maintenance and help for teachers) constitute a fifth factor of success for innovation, as they contribute to producing appropriate answers to the actors' actual needs.

In the end, these five types of action constitute the guarantees for innovation to take place. However, if they are necessary, they do not suffice on their own. Indeed, the time and pace of technological innovation are not the same as those of social innovation. As a result, in order to face the challenges raised by social innovation in the long term, it is essential to provide a specific program for the actors, which will enhance the chances of innovation to be developed and disseminated. The philosophy underlying such a program will be developed in the next part of this chapter.

A Plea for a Comprehensive Action: Research Training Program

Teachers and Tutors

We will here consider 'teachers' as including the various roles of teachers, designers and tutors. Indeed, the development of computer-mediated and online learning spaces has given rise to a number of emerging roles as a result of

a deconstruction-reconstruction process in the educational community. This trend was initiated as early as the advent of the communicative approach in language learning, with its focus on the learner. The teacher has since then evolved from the transmitter of knowledge to the guide, the advisor and the support of the learner. He is now faced with a new challenge, as he must adapt to the changes brought about by the fast-growing competition of distance learning environments. New skills are required of the teacher as tutor, as designer of language learning materials and tasks, of computer-based learning spaces, or even of hybrid or blended learning environments.

What new competences should be developed? They might be difficult to list in a bottom-up perspective aiming at generalizing the variety of actual practical situations. This perspective entails a joint analysis from practitioners and researchers of the activities and the competences they require, based on the observation of practices. If we follow Deschryver (2000), we can expect this analysis to focus on four main domains of competence:

- Technological competence: how to develop computer expertise and become an efficient and organized user, i.e. someone who understands the basic principles of software and who can reflect on one's own learning.
- Pedagogic competence: how to develop basic pedagogic competences such as analyzing a given pedagogic situation, designing strategies to reach specific objectives, managing classes, time, environment, etc. In distance learning settings, such competences are more frequently and more significantly drawn upon than in traditional face-to-face situations.
- ICT competence: the capacity to use the technology does not suffice in itself. The teacher should also understand how the various media transform information, communication, and the related activities in order to devise appropriate ways of using them. This understanding can be derived from experience, provided it is properly analyzed. It can/should be enhanced by research in the field.
- Meta-competence: these are high level cognitive and socio-relational competences required by self-direction, flexibility, adaptation, communication, and collaboration, all of which are associated with the process of innovation implementation. Examples of such competences are understanding complex interactions, identifying and solving problems autonomously, communicating and collaborating with others (Deschryver, 2000, p.6).

In the same way, tutor training will benefit from Nelly Guillaume's (2009) work. She suggests distinguishing between three specialized types of tutors: the methodological, the disciplinary, and the technical tutors. She then defines six functions and their associated roles:

- social function: greeting, explaining objectives and organization, animating and regulating synchronous communication, forming teams;
- technical support function: writing and implementing a communication charter, describing and explaining the learning environment/space, suggesting technical resources, advising in communication options, helping to solve technical problems;
- disciplinary support function: providing materials, answering questions on tasks and contents, soliciting peer work on materials;
- methodological support function: helping on work methods, on tasks organization, providing moral and affective support, favoring peer collaboration and

communication, proactive and reactive interventions, transferring acquired skills into the personal project;

- regulation/metacognition function: suggesting using a team or individual logbook, helping the learner follow his/her own progress, soliciting decisions on regulation of the learning process, analyzing and self- regulating one's own activity as a tutor (Guillaume, 2009).

This typology may feed and stimulate reflection and action for group analysis of tutor practice. The training of both teachers and tutors should most probably benefit from a hybrid environment, as in such contexts, the teacher is in exactly in the same situation as the learner in the environment he is supposed to implement (Roupié, 2008). By being immersed in this type of environment, he can experiment with the learning conditions it offers and can get a better insight into the difficulties involved.

To avoid this approach being viewed as essentially procedure-driven, it should be complemented by a participative dimension involving all the actors, in a common analysis of the context. An example of this is the method developed by Charlier, Daele & Deschryver (2002)[2], which they call the 'action-research training' program, for the training of teachers to ICT use. For these authors, ICT integration in teaching/learning practices cannot be reduced to a mere training program. The action-research training concept (Hauglustaine-Charlier, 1993, Charlier & Charlier, 1998) combines collective action and research involving teachers, teacher trainers and researchers.

The originality of this research mode lies in the complementarity of the three actions implemented simultaneously. Research contributes to the regulation of the training which, in turn, supports research. The training supports the action of the teachers being trained, and becomes an object of study in itself. Everyone can benefit from it for their own practices in a collaborative way (Daele & Charlier, 2002). This approach was originally formalized by Bonamy, Charlier & Saunders (2001). It uses research to regulate action, takes every individual actor's experience and institutional context into account, relies on quantitative and qualitative data, and is notably assessed by the actors[3]. (Charlier, Daele &, Deschryver, 2002, p. 18)

As far as the institutional context is concerned, data should be collected by interviewing colleagues, members of the management. Local resources and constraints should also be identified so as to form a clear view of how the teachers can actually integrate technology in their practices. This is in line with the context analysis previously described. The authors outline five methodological dimensions: training-practice articulation, ICT roles, learning modes, function of the network, and teachers' roles. The teachers' network especially plays a dual part as supporting collaborative learning on the one hand, and supporting pedagogic innovation on the other hand, thus facilitating the achievement of the project and ensuring support from the other members of the institution. This program can be seen as a stimulating example of how context diagnosis and collective construction of the learning environment can be combined.

Other Actors' Training Needs

Small-scale complementary actions could be taken to meet the training needs of other actors, appearing in the course of the innovation process. Computer technicians, for example, can play an active part in interfacing technology and pedagogy. The idea is not to turn them into experts in pedagogy, but to develop a common language between teachers and computer technicians.

In the same way, and still as an answer to their explicit demand, one can sensitize the various local actors to the issues raised by distance learning: secretaries, administration members, management, decision-makers, etc. Such initiatives may be useful only insofar as a demand is expressed

in relation to the consequences of the proposed innovation. While they cannot therefore be planned in advance, their design requires experts in training engineering and appropriate financing.

Managing, Monitoring and Regulating Learning Environments

Managing and monitoring the project imply setting up from the start an organizational structure (steering committee) whose mission it is to schedule, manage, and assess the project. The average delay before innovation yields observable results and is fully integrated oscillates between two and four years. This means scheduling should be accurately suited to the project dimension, realistic and consensual. The various steps to be taken can be clarified without their order being chronologically defined (except for the first one).

Context analysis is a preliminary phase based on semi-directive interviews with the local actors. Once these have been fully transcribed, a thematic textual analysis is carried out to establish a diagnosis of the situation as mentioned earlier, and to offer indications for the further elaboration of the project.

The second step involves collectively designing the innovation project. It relies on the restitution and the critical discussion of the context analysis results. This collaborative model of the decision-making process makes it possible to validate the project fully or in parts, and to clarify problematic issues. The workgroup in charge of designing, organizing and planning the project can then be constituted, on the basis of consensual validation and volunteering (see chapter 8 for innovator and active minority support). The project should be based on a medium-term vision of change while at the same time fix realistic time frames that can easily be observed, even when modifications take place on the way (Basque, 1996). The project will include the following dimensions:

- Technological dimension: equipment, software, networks, etc. As far as equipment is concerned, the prevailing principle should be that technology should be available whenever needed. Similarly, compatibility between the various types of equipment should be checked, software should be chosen judiciously bearing the teacher in mind (Basque, 1996).
- Organization dimension: new tasks, administrative and technical procedures, new roles, new division of work, etc.
- Learning environment: type, financial considerations, design and follow-up.
- Information and communication on the innovation to come.
- Ethical dimension: confidentiality matters, copyrights, etc.

After a few work meetings, the project can be presented to the steering committee for amendments and validation.

We remain aware of the somewhat theoretical nature of the implementation process we present in these pages, as the initial stance was to avoid referring too explicitly to specific – and time-related – real-life contexts. Although some of the hypotheses we are led to draw will have to be validated by further action-research, we believe the implementation of an action-research training program such as described above is likely to facilitate the integration of pedagogic innovation in institutions. Setting up a network of teachers and tutors in a given context (or contexts, as the case may be) seems to be a 'natural' continuation to this approach. Indeed, networks favor internal cooperation, mutual support and help. They enhance the actors' motivation and promote their own practices as innovation is taking place.

This action-research training step presupposes that expertise from the various fields of research in sociology concerned (education sciences, education sociology, psycho-pedagogy) will be

involved. Final planning of schedules and places can then take place, as well as the definition of objectives liable to bring all the various actors together.

The final phase will consist in providing for complementary actions required from the local contexts (emerging needs for specific training, complementary training for teachers and tutors, or any other actors – workshops, seminars focusing on specific elements, etc.). Sufficient budgets will have to be provided for and particular attention will be given to the details of the training sessions (Stecher, 1991, Van den Akker, Keursten & Plomp, 1991):

- organize the sessions on site;
- privilege local teachers;
- allow enough time for training;
- favor volunteering to compulsory attendance;
- avoid restricting training objectives to technical topics and include such issues as pedagogic integration or software selection and evaluation;
- balance lectures and activities; provide technical and pedagogic guides, detailed curricula and materials to be taken home after training is over;
- relate training to the teachers' individual practices;
- favor interaction between the participants;
- favor mixed ability groups;
- when feasible, allow reduced teaching responsibilities so that the teachers can reinvest their training and develop innovative applications;
- provide post-training follow-up.

Finally, in addition to its management and follow-up roles, the steering committee must assess and regulate each step of the innovation process. Did the project take place as planned? Are we progressing towards the goals? How do representations and attitudes evolve? Are organizational impacts controlled? Which retroactions can be observed between the various sub-systems and the external systems? Are new competences developed and implemented? Are interactions fruitful between action, research and training? These questions represent the indicators of performance and progress to which the steering committee must pay attention and on which it should communicate. Communication on the project and its advancement is indeed essential to make it comprehensible and acceptable to all the actors concerned.

SYNTHESIS

How has the chapter answered the questions raised in the introduction?

- How can the didactic ergonomics model be operated? The didactic ergonomics model introduced in Section 1 and discussed in Section 2 outlines the complex nature of distance learning contexts. To face this complexity, the authors advocate an engineering approach to the design of such learning environments. This engineering perspective is based on the four traditional main phases: course analysis, learning environment design, implementation and assessment.
- What are the basic principles of an engineering approach? a) Needs cannot be determined *ex nihilo*; they have to be constructed for each specific context. b) Although described as four linear phases, the engineering approach must be planned as a whole from the start and assessment issues should be considered together with the design phase. c) The smooth implementation of the engineering approach depends on the clear identification of specification for a given innovation. d) All actors should be involved in the innovation process since its initial phases.

- How can the innovation process be supported? It is suggested that the engineering approach should integrate an action-research training program aimed at teachers and tutors. This program aims at orienting innovation by making sure that the needs of all the actors involved in the process are identified and taken into consideration.

The authors believe that for pedagogic innovation to be successful, it must go hand in hand with institutional innovation. This stance is yet to be fully validated by further action research.

AUTHOR NOTE

Note: quotations originally in French have been translated by the authors. The original text is presented in the end-of-chapter notes.

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ENDNOTES

1 For a detailed description of the construction of and the differences between hybrid and blended environments, the reader will profitably refer to (Deschryver, 2008, pp. 57-60).

2 The reader can also refer to the LEARNNETT project (http://tecfa.unige.ch/proj/learnett) associating Belgian researchers and teachers from various institutions as well as other European partners. The project is funded by the Distance Learning French Community in Belgium and the European Socrates program.

3 *Cette modalité de recherche tire son originalité de la complémentarité entre les démarches mises en œuvre simultanément. La recherche aide à réguler la formation qui, elle-même, sert de support à la recherche. La formation sert de support à l'action des enseignants en formation, celle-ci est analysée lors de la formation. Chacun en tire parti pour sa propre pratique dans un esprit de collaboration et de partage de compétences (Daele & Charlier, 2002). Cette démarche formalisée par Bonamy, Charlier & Saunders (2001) exploite la recherche pour réguler l'action, tient compte des expériences individuelles de chaque acteur concerné et des contextes institutionnels, utilise des données quantitatives et qualitatives, et est notamment validée par les acteurs eux-mêmes.*

Chapter 11
Pedagogic Consequences:
A Task-Based Approach to Distance Second Language Learning

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INTRODUCTION

As seen in chapter 4, CLT proponents assumed that the best way to approach learning a second language was to provide the learners with a great quantity of authentic input and with opportunities to discuss and process the second language.

It gradually became clear that it is not possible to specify what a learner will learn in linguistic terms and that compatibility with the cognitive processes involved in L2 acquisition had to be ensured. Task-based Language Teaching (TBLT) was one of the responses (see chapter 3). Prabhu (1987) suggested that content could be specified by holistic units of communication, i.e. tasks, and by pre-selection of linguistic items. This did not seem sufficient, as was seen in chapter 5, Long & Crookes (1991) emphasized the need for learners to attend to form consciously.

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Issues of cognitive demand placed on the learner by the complexity of tasks have raised the question of how to reduce the cognitive load the learner has to cope with. This involves linguistic difficulty, but also problems related to cultural schemata and task familiarity. This cognitive demand may make it difficult for the learner to deploy cognitive resources to notice inter- and intra-lingual gaps.

Task-based learning is an example of Gagné's higher order learning (1985) which depends on the automatization of lower order skills.

The task-based learning tradition has moved from an emphasis on negotiation of meaning to an investigation of a number of issues related to Form-Focused Instruction, shifting thus to a more cognitive stance. The actional approach, also linked with CEFR (Council of Europe, 2001), and the sociocultural approach which is influential in distance language learning settings (Lamy & Hampel, 2007), do not advocate cognitive reflection to the same extent.

OBJECTIVES OF THE CHAPTER

This chapter is dedicated to how language learning and teaching research can actually be applied to distance L2 courses. Its objective is to enable the reader to organize and run courses along the theoretical lines defined in the previous chapters. Initially, some pages will be devoted to defining what tasks are, why they have attracted our attention and how they have been dealt with by researchers and practitioners. Details of the two major approaches and of the approach we suggest for distance learning will follow. Because of the demands of blended or distance contexts, we have been led to propose macro and micro tasks in a dual learning cycle which shares many of the common features of the other task-based approaches, and this will be presented at length (online course models, guiding principles, movement from the curriculum to the syllabus and course design, thematic and linguistic content). We will show how the learner can become the course designer and how sequencing tasks can be handled.

A practical classification of tasks will be described: in terms of design and characteristics, including feedback and monitoring. This will lead to a taxonomy of tasks (micro and macro tasks, specific tasks, CMCL settings).

Assessment, including formative vs. summative evaluation, certification and assessing the course, will conclude the chapter.

This chapter will not cover the engineering aspects of course implementation as they were the subject of chapter 10. It will not deal with the purely technological side of tasks either. References to both these subjects will only be made when specific theoretical demands of second language learning justify them.

As suggested in previous chapters, readers can initially try and find how they would anticipate the content of the chapter, and compare with what they will find. A synthetic table, at the end of the chapter will make this comparison easier. Personal or interactive discussion of the differences will prove useful for personal appropriation of the content of the chapter.

TASKS FOR DISTANCE LANGUAGE LEARNING ENVIRONMENTS

Definitions

Task-based learning (TBL) is based entirely on meaningful tasks and follows procedural syllabi: sets of tasks based on real-life situations (Nunan, 1989). It focuses on the use of authentic language. Assessment is primarily based on task outcome, defined as the appropriate completion of tasks, and not on accuracy of language forms (see the levels of proficiency of CEFR in chapter 3, and Council of Europe, 2001).

As a consequence, a task:

- involves real world meaningful processes of language use;
- can involve any or all of the four language skills;
- has a clearly defined socially realistic outcome;
- triggers cognitive processes;
- involves the learner personally (individual outcome).

Tasks have a clear sociocultural dimension (Ellis, 2003), which should not be overlooked.

Advantages of Implementing TBL

The advantages have been listed in chapter 4. Linguistic syllabi are not effective in promoting acquisition because they do not conform to acquisitional processes, whereas TBL corresponds to our understanding of what language is (see chapter 3). There is still little empirical evidence to demonstrate that TBL courses are more efficient than linguistic syllabi, which implies that reflective practice should measure their validity.

Table 1. Differences between CLT and AA

	Communicative Language Teaching (CLT)	Actional Approach (AA)
1	Interaction	Co-action
2	Communicative objective	Social objective
3	No distinction between using and learning	Distinction between using and learning

The learners' language experiences create a natural context which is personalized and relevant for them, and thus, what is learned emerges from the learners' needs. However, TBL may over-emphasize some beliefs such as 'completing the task is what matters', which may lead to fossilization instead of interlanguage development, as shown in an interesting experiment in Benin (Fanou, 2009).

THREE COMPLEMENTARY APPROACHES

The Action-Based Approach

TBL in general is related to CEFR theory of the actional approach (Council of Europe, 2001). In this theory, the use of language is not dissociated from the actions carried out by the person who is at once a speaker and a social actor. This ranges from the most practical activities to the most conceptual ones. Linguistic competence, therefore, can be solicited more or less fully depending on the requirements of tasks.

In CLT, learners are expected to take part in authentic or simulated exchanges in the classroom, whereas in the action-based approach the aim is to engage in collective actions both in the classroom and in the real world. The differences are demonstrated in Table 1.

Interaction versus co-action: in CLT, the aim was to interact with others, now it is to act with others in order to reach a common outcome/. The learner is a social actor and the tasks are collective.

Communicative versus social objective: communication which was the main objective in CLT is now one objective among others. Tasks in AA are not purely linguistic and assessment is of a pragmatic order and is concerned with process as well. This change reflects a change in society: in the eighties, the aim was to communicate with foreigners punctually to exchange information (see the Threshold Level, Council of Europe,1975). Now learning another language is directly linked with European construction and aims to prepare citizens to work with native speakers of other languages and cultures (Puren, 2004, p. 40). Consequently, intercultural competence is now seen as co-cultural construction (see chapter 3) which will enable people from different cultural backgrounds to live and work together in the same society.

The distinction between using and learning is a reference to the Council of Europe's CEFR (chapter 3, and Council of Europe, 2001), as a language user, the individual performs different activities than as a language learner. Using implies collective social actions whereas learning may result from intermediary tasks that may result in acquisition (cf. our distinction between macro and micro tasks). The actional perspective had not delved deeply into task design, with the exception of TBLT. A recent issue of *Le Français dans le Monde, recherches et applications* (Rosen, 2009) shows a change, but the approach has not yet followed TBLT towards more attention to form.

Task-Based Language Teaching (TBLT)

As has been stated in the introduction to this chapter, the task-based learning tradition has moved from an emphasis on negotiation of meaning to an investigation of a number of issues related to Form-Focused Instruction (FFI, see chapter 4), as will be seen by the following descriptions.

Ellis (2003) suggests several solutions to sort out the problem of designing meaning-focused tasks that will lead learners to focus on form:

- Interpretation tasks designed to induce learners to pay attention to specific grammatical forms while processing spoken or written input for meaning.
- Consciousness-raising tasks that engage learners in thinking and communicating about language; a language point becomes the topic of conversation.
- An "integrated approach" such as content-based courses where learners learn the language while engaged in learning subject content.
- The "modular approach", in which the syllabus is made up of two entirely separate modules consisting of a communicative-based module and a code-based module.

Ways of integrating these four approaches will be described in the next subsection.

TBLT syllabus design can be accomplished in three steps:

- classifying tasks;
- choosing the thematic content of tasks;
- sequencing tasks in accordance with explicit grading criteria so that learners can, in the syllabus and within each unit, do the final task. This means establishing procedures for evaluating each unit and the whole (relative value and meaning of each task).

Descriptions of these steps can be found in Ellis (2003). In a TBLT syllabus, a task-based sequence consists of three main phases (Willis and Willis, 2007):

- pre-task phase;
- during-task phase;
- post-task phase.

Pre-Task Phase

This phase includes activities that teachers and learners can engage in before they start a task in order to prepare learners to perform the task in ways that promote acquisition: introduction of langue features, rehearsing, observation of models, consciousness raising activities, exercises, pre-planning of task (traditional classroom activities geared to the task).

Research results in pre-task planning confirm the relevance and validity of such work (Bygate et al., 2001, and Ellis, 2003). Reference to these results will prove useful to course and task designers.

During-Task Phase

This major phase consists of the activities required by the task itself and affords various instructional options, such as "task performance options" and "task process options".

Task performance options are the pedagogical decisions about the way the task is to be handled and include time management, access to input data and unpredictability in the task.

Task process options are the way in which the discourse arising from the task is enacted (purely conversationally, encouraging explicit messages and/or risk taking, with implicit or explicit focus on form). These options also include the amount of scaffolding expected to result from learner interaction, the way the agenda will be monitored, the structure of the task and the way it develops, and eventually the manner of dealing with errors.

Post-Task Phase

The final phase results from the need for follow-up on task performance. Three major goals have been suggested:

- to provide an opportunity for a 'repeat performance' of the task;
- to encourage reflection on process (how the task was performed);
- to focus attention on forms that proved problematic to learners when they performed the task, or on other forms.

Research in post-task effects has shown (Skehan, 1998, Bygate et al, 2001) that anticipation of the post-task increased the attention of learners during the task. If the post-task is planned to emphasize a focus on form, the interaction during the task will display greater accuracy on the part of the learners.

Appreciation of TBLT

To conclude TBLT is a much researched, well-constructed approach that meets a great number of theoretical requirements. It is still largely concerned with classroom practices and remains teacher-centered in the ways the courses are designed and run. Self-directed learning, distance contexts and a different educational culture can lead to a different organization of very similar elements.

Macro and Micro Tasks in a Dual Learning Cycle

Another Approach for Dealing with Tasks

Some of the limitations of classroom-based teaching (Narcy, in Ginet, 1997) induced some teachers and researchers to find an alternative in self-directed learning, blended approaches or distance settings in order to gain flexibility of planning thus leaving more space for learner control. The learning cycle, as described in chapters 2, 3, 4 and 5, is the conceptual framework of what is presented in the following pages, it shows how learning circumstances can be organized (Spear and Mocker, 1984).

Types of Tasks

The cycle consists in fact of two cycles based on two types of tasks that are used simultaneously:

Macro tasks (Table 2) can be said to correspond to the central tasks in TBLT. Though, type A macro tasks can be used at the onset of a course, or of a sequence to uncover obstacles in a more realistic way than a pre-planned series of activities would (pre-task phase). According to their performance in such a task and after negotiation with their tutors, learners can determine whether they need a set of micro tasks to help them prepare for the next macro task.

Type B macro tasks can play a similar part, but, especially in planned courses, they might lead learners to produce output before uptake has been effective (see chapter 4). Fanou (2009), shows the effects of producing output too early in a task-based approach in Benin.

Micro tasks (Table 3) will provide the type of work that is carried out in the pre- and post-task phases of TBLT.

Micro tasks will include the interpretation tasks and the consciousness-raising tasks described in the TBLT section above, as well as the more practice-oriented tasks that TBLT does not necessarily propose.

This division of one major learning cycle of tasks into two complementary cycles of tasks (see chapters 2 and 4) takes on board the four solutions Ellis (2003) suggested (see above) and it can accommodate "integrated approaches" such as content-based courses. The two cycles constitute two entirely separate systems broadly consisting of a communicative-based module and a code-based

Table 2. Macro-tasks

MACRO TASKS	Objectives	Task features	Work organization	Media
Type A - No L2 output - assessment of learning needs	- sensitization to obstacles - awareness of inter and intralingual gaps - creating learning needs	- realistic tasks - material outcome - closed tasks - heuristic tasks -problem-solving tasks	- Individual or pair work	- Multimedia support - Internet .../... + instructions and monitoring.
Type B - L2 output - Interaction - assessment of learning process and/or product - assessment of learning needs	- meaningful activities - socially realistic outcome - implicit L2 production. - assessment of noticing - assessment of process - assessment of product - assessment of needs - complexity and its influence on accuracy and fluency	Open tasks - Open tasks - unpredictable content (information, opinion, or knowledge) - pair or tutor feedback in the task (realistic interaction)	- best in pairs or groups	- Microworld - Moo - Problem-solving tasks - Webquest - Tandem work - Academic tasks .../... + instructions

module (see TBLT above). However, integration of the learners' work in the two cycles is a key component of the environment and depends largely on how monitoring, feedback and assessment will be conducted. Such an environment can be qualified as an organizing environment (Spear and Mocker, 1984), since very little planning needs being done initially: the choice of macro and micro tasks unfolds according to the perceived needs and the guiding demands of the curriculum.

Arthaud (2007) describes a learning environment which combined collective macro tasks and micro tasks available from a virtual resource center. His research can help devise adaptable virtual resource centers.

Arthaud and his colleagues organized their virtual resource center and actually developed the tasks following procedures described in chapter 10. A great variety of tasks in large numbers are now available online for such centers to take the

Table 3. Micro-tasks

MICRO TASKS	Objectives	Task features	Work organization	Media
Type A **(Pre or post macro task)** Awareness raising or recall	(Re)creation of adequate explicit knowledge: - phonology ; - morpho-syntax ; - lexis/ instances ; - concepts ; - culture, etc. - accuracy	Closed tasks leading to implicit knowledge: - low cognitive load -no output in L2 -predictable content in order to notice the gaps.	Individual	- incorporated monitoring and feedback.
Type B (pre or post macro task) Controlled practice	- (Re)practice of controlled automatic production - accuracy - fluency	(a) imposed meaning. (b) creative: - closed tasks (practice) ; - predictable content (reduced cognitive load) ; - pertinent and automatic choice of problematic features.	Individual or pair work	- listening and speaking - reading and writing - ICT tools (audio, video, pictures, voice recording, etc.) - incorporated monitoring and feedback (pedagogic agent), etc.

form of sites or to be included in the tools of a web-based platform offering guidance and links to appropriate micro tasks (see http://cedricbrudermann.googlepages.com/home, last visit Feb 2009). Such an approach is less time-consuming and more economical than developing each task of a resource center. The links with the micro tasks must be checked regularly since sites may evolve or be closed, and the theoretical validity of each micro task must also be checked.

The flexibility of and the reliance on organizing circumstances described above may be seen as a compromise between traditional courses and van Lier's ecological approach (1996) and the roles he describes for learning sites. In some institutional and cultural contexts, radically innovative approaches may cause useless resistance.

Task Sequencing

The approach suggested in this book offers a number of flexible options. Benoit (2004) describes sequences that are reminiscent of the three phases of TBLT: planned and sequenced micro tasks (pre-task phase) in order to prepare a macro task that leads to more micro task work (post-task phase). Arthaud (2007) describes a use of micro tasks resulting from needs emerging from mainly collective type B tasks. Finally, Narcy-Combes and Narcy-Combes (2007) describe more flexible approaches in distance courses of short duration, in which the recourse to micro tasks was limited due to time constraints, and institutional requirements imposed learner-designed academic macro tasks.

In the multiple ways they can be organized, the three phases are in direct relation with the sub-systems outlined in chapter 1:

- Pre-task phase → teacher-centered sub-system (Figure 16 in chapter 1) (planning and pre-organization);
- During-task phase → learner-centered sub-system + regulation sub-system (monitoring and feedback) (Figure 17 in chapter 1);
- Post-task phase → regulation sub-system (retroaction, adaptation…) (Figure 19 in chapter).

This should be borne in mind when attempting to design intelligent systems that include teaching agents (see Bertin and Narcy-Combes, 2007, or Bertin, Narcy-Combes & Gravé, 2009). Such systems would meet the expectations of learners who appreciate the flexibility of the approach but feel the need for more guidance and feedback (Narcy-Combes, 2005) in performing the tasks in order to avoid wasting their time or uselessly increasing the cognitive load. Implementing these systems would require solving engineering problems as described in chapter 10.

COMMON FEATURES OF TASK-BASED APPROACHES

Online Course Models

White (2003, p. 219) describes four types of models. Her descriptions can help us to see how to adapt to different contexts:

- *a course package + support model (e-mail and/or computer conferencing),*
- *wrap around model, a model congruent with a resource-based approach to learning with specially designed materials (study guide, activities and discussions) are wrapped around the existing materials (textbooks, CD-ROM and commercial videos) (a more demanding option on the teachers for creating a course through interactions with the learners);*
- *integrated models or rare models.*

The model described in this book can fit any of these models: (1) a course package will defi-

nitely require a sequenced course, and micro tasks will have a limited technological flexibility; (2) a wrap around model will give more flexibility than a course package. Micro tasks could be implemented more successfully. Other course designs might be implemented including more use of CMC depending on settings, resources, access to the web, etc.

Modes of delivery of online courses (White, 2003, p. 220) can also justify adjustments in the approach described in this chapter:

- *satellite-delivered classes to sites with medium-sized numbers (+ print materials and weekly computer conferences);*
- *broadcast TV, supplemented by printed and audio materials, and some chat facilities;*
- *broadcast print-based courses with electronic support systems to relatively large numbers;*
- *print-based courses, with range of synchronous and asynchronous media;*
- *web-based courses.*

The first three modes of delivery rely on very different principles and this model cannot be seen to adjust easily to their requirements. Depending on contexts, resources and opportunities, the remaining two modes are perfectly adapted, use of a web-based platform would increase efficiency and allow (intelligent) monitoring.

Guiding Principles

However flexible these courses are meant to be, course designers must facilitate the work of the learners and this will include the points set out in Table 4.

Applying these principles will ensure the coherence of the course and maintain learner motivation and confidence. The teaching team will need adequate training and action research may help assessing the strong and weak points of a course and make the necessary adjustments when appropriate. This in turn will lead to better knowledge of what such courses entail.

Table 4. Guiding principles

Points to be solved	Suggestions
Integration of language, content and culture	They will be maintained even if this may prove easier in the macro tasks than in the micro tasks, and content expertise of the tutors will be sufficient in order for the learners to feel convinced (see chapter 4)
level of task difficulty	An appropriate level of task difficulty will be ensured especially when the learners collect the materials or design the tasks.
task-based sequence/ course sequence	Clear goals will be established for each task-based sequence if the course is sequenced or for the course if the work results from constant negotiation. The link with the curriculum must be discussed and maintained.
Learner involvement	Learners will be encouraged to maintain an active role and to take risks. Tasks will be designed to encourage pair or small group work. Facilities for such work must then be implemented in the course structure.
Content, culture and language-related instructions	Specific instructions will be given to learners in relation to content, language and culture according to the requirements of the curriculum, what is known of their learning needs and their working context. These instructions will focus learners on meaning, while ensuring that this focus on meaning will provide opportunities for focusing on form (e.g. *selecting three articles that deal with past activities in a specific field and writing a short report classifying the validity and effectiveness of the activities will lead learners to pay attention to past forms and to comparatives*). Preparing clear, coherent instructions that are related to the curriculum and that do not hinder the learners' creativity remains a challenge.
Guidance	Guidance will lead learners to evaluate their performance and progress.
Role of tutors	Tutors will ensure that investment in the tasks is rewarding so that learners feel motivated. This will include appropriateness of organization, recourse to macro tasks and to micro tasks as needed, and easy access to the (virtual) resource center and adequate support and supplements (see chapter 9).

Initial Steps: From the Curriculum to the Syllabus and Course Design

Irrespective of the flexibility and the learner-centeredness, the initial steps of such courses (Table 5) will be closely similar to what is done in other courses (see chapter 10).

These initial steps will be a way of ensuring that the course starts smoothly. Learner anxiety will be reduced and tutors will assess any need for adjustments.

The Thematic Content of the Material

How the materials are determined and collected according to situations and themes set in the curriculum has just been described. White (2003, p. 39) sees materials as plans for learning. Once the materials are collected the tasks will be designed as a compromise between the learning opportunities provided by the material, the curriculum and the present level of proficiency of the learners.

Context of delivery (Laurillard in White, 2003, p. 40) is paramount. In classroom settings, the teacher sees to the delivery of the materials and adjusts his or her teaching accordingly. In a distance environment, the social interaction, the cognitive work and the feedback must be integrated with the materials, or the learners must be in a position to do so when they are the course and task designers.

The Linguistic Content

The linguistic content will be determined by the requirements of the curriculum, the pedagogic purpose of the course and the specific problems the L2 presents for learners with a given L1 or language learning experience. For example, in the case of English courses in a French-speaking context, some major points will be taken into account, irrespective of the course objectives.

Table 6 can be adapted to other L2 and contexts.

The Learner as a Task Designer

The advantages of empowering learners with the design of the course and of the tasks in relation with the tutors have been described. However, this may be facilitated by support tools as seen in the course described in Table 7.

More research is being carried out to improve this system and to monitor learner techniques more adequately (reading techniques and techniques

Table 5. Initial steps

Problems	Suggestions
Content	Content will be specified (social, cultural, professional, thematic and linguistic) by reference to the curriculum and to the level(s) of proficiency to be attained in the various skills (in CEFRL terms for example).
Materials	The defined content of the course will guide their collection if the course is designed by the teachers, or clear descriptions of the types of materials to be collected by the learners will be drawn, with advice/instructions on how they can be accessed. In the case of non-specific language courses, the factors to consider are topic familiarity, intrinsic interests of learners, topic relevancy to learners' situation, whereas in specific usage language courses, attention will be on realistic tasks that will prepare the learners for the target tasks they will need to perform in their professions or other specific activities.
Link with curriculum	Pre-course checks of whether the materials collected cover all or most of the requirements of curriculum will be made if the course is pre-designed. If the course is not pre-designed, ways of checking whether the materials collected by the learners cover these requirements will be implemented.
Learner training	Specific tasks will be suggested to train the learners to cope with unexpected or totally new content in order to keep them relying on avoidance strategies (select materials dealing with data they already know). This point is to be discussed with learners.

Table 6. Linguistic content

Domains	Specific features concerning francophones learning English
Phonology	Phonological filter and phonological practice, spelling vs. pronouncing, stressed language vs. syllable-based language
Major features	Major features in terms of forms (aspect and reference to time, determination: use of articles, theme and rheme, quantity, and syntactic features, etc., but also attention to syntactic cues and not pragmatic cues to process the language
Sociolinguistic problems	Awareness of sociolinguistic problems connected to global use of English, awareness and use of similarities between English and French
Intercultural and interdisciplinary awareness	Intercultural and interdisciplinary awareness (content and methodology in academic, professional and other contexts)

for processing the abstracts: learners can work hard but not very effectively. Monitoring might reduce their difficulties (see chapter 5). In an ergonomic perspective, this is an illustration of how a learner-centered sub-system interacts with other sub-systems and the global system, in order to introduce a more dynamic way of working (see chapter 2). This may prove more complex in more interactive macro tasks.

Task-Based Sequences in Courses

Planning a task sequence is a real issue when relying on social situations and the materials pertaining to them. A logical way of sequencing the situations for the learners must be found.

Sequencing can be done based on criteria of complexity, 'chronological' ordering or of conceptual difficulty (see Table 8).

Regardless of the care taken to sequence a course, recourse to authentic materials will lead to some features being 'too difficult' for some learners at a given stage. This explains why type A tasks (see above) will help, they can be done without requiring premature output and uncover needs that can be dealt with subsequently.

CLASSIFICATION OF TASKS

Task classification can be useful either to design a syllabus and to sequence tasks or to ensure that the

Table 7. Example of learner-designed course

Course	Distance courses in the University Sorbonne Nouvelle.
	No streaming. Students from different domains of studies.
Students	Undergraduates in Master course in didactics and linguistics.
Tasks	Abstracts of journal articles related to linguistics selected by learners themselves (and other academic tasks in which learners select the topic and find the resources: oral presentations, reports, etc.).
Support	Special software designed so that learners can download their article in a column on the computer screen and process their abstract in the other column. They can also use links to the different aids they may need. When the abstract is completed, it is sent off to their tutors.
Aids	Links to dictionaries, grammar sites/comments, etc.
Feedback	Comments on tasks (process oriented: comments on techniques). Suggestions of micro tasks for recurring problems.
Post-task sessions	post-task sessions help learners apply different techniques depending on their level of proficiency, and even suggest micro tasks
Micro-tasks	Micro tasks available from a virtual resource centre described above (see appendix).

Table 8. Task sequencing

	Characteristics of the task	**Factors relating to the learners as individuals**	**methodological procedures used in the task (Ellis, 2003)**
Complexity	nature of input, task conditions, procedure, etc	level of proficiency or learning styles	Some types of tasks are more complex than others. (Type B tasks should be sequenced after type A tasks, etc.)
Chronological ordering	situations first encountered in real life being seen first		
Conceptual difficulty	Easier things done first: - Specific purposes, - Content-based courses, - Academic courses		

addition of all the tasks carried out by the learner(s) meet the demands of the curriculum.

Two ways are suggested by Ellis (2003):

Either according to:

- *Kind of activity they require the learner to do;*
- *Language skill they focus on;*
- *Kind of discourse they are intended to elicit;*
- *Input material they involve;*

Or through a:

- *Pedagogic classification based on pedagogical procedure/skill required of learners;*
- *Rhetorical classification based on different discourse domains or different genres;*
- *Cognitive classification based on cognitive operations different types of tasks involve;*
- *Psycholinguistic classification based on interactional categories that have been shown to affect the opportunities learners have to comprehend input, obtain feedback and to modify their own output.*

In order to be able to use this classification appropriately, teachers must analyze the curriculum in terms of the different categories described: expected activities, skills, discourse, cognitive operations, linguistic and pragmatic content.

Task Design

TBLT theorists show a concern for language form without compromising the communicative nature of the task. Some of their suggestions can be included in interactive type B macro tasks:

- grammatical structures can be the subject, or one of the subjects of the task itself (Fotos & Ellis, 1991);
- unobtrusive imposition of the use of some features of L2 (Loschky & Bley-Vroman, 1993, and Samuda, Gass & Rounds (1996);
- production of language and reflection upon its structure in a collaborative writing task (Swain, 1998) or oral task (Rees, 2003).

Interactive tasks can serve as catalysts for interlanguage development by requiring negotiation of meaning in the task (clarification, confirmation): effective task design or instructions will increase the chances that meaning will be negotiated. Some form of monitoring can help the tutor provide adequate feedback as exclusive attention to meaning in such tasks may be detrimental to acquisition of valid L2 features (Aimard, 2006, Grosbois, 2007).

Richards & Rogers (2001, p. 20, in Lamy & Hampel, 2007, p.71) describe a three-level model for task development including approach, design and procedures:

- approach results from the theoretical choices made;
- design requires analysis of objectives, types of learning and teaching activities, roles of learners, roles of teachers, and roles of materials in accordance with approach;
- procedures, in agreement with theory and design, include moment-to-moment techniques, practices, and behaviors and focus on presentation, practice and feedback phases.

These principles can also apply to micro tasks. However, micro tasks present different characteristics; in particular learner design may not be as beneficial nor as feasible an option. Design of micro tasks in self-directed or blended learning centers (Arthaud, 2007) can be transferred to a distance setting with special attention paid to delivery, monitoring and feedback. ICT can help design and review tasks to an extent which was unimaginable one or two decades ago.

Task Characteristics

Task characteristics should be assessed when designing the task and when interpreting feedback. Skehan (1998) has defined indicators of task complexity which include:

- code complexity (linguistic complexity and variety, vocabulary load and variety);
- cognitive complexity (cognitive familiarity, familiarity of topic, discourse genre, and task);
- cognitive processing (information organization, amount of 'computation', clarity of information given, sufficiency of information given);
- communicative stress (time pressure, scale, number of participants, length of texts used);
- modality;
- stakes;
- opportunity for control;
- availability of aids.

Performance has already been seen to have three dimensions in TBLT: fluency, accuracy and complexity. Their interplay is described in Skehan (1998) or Skehan & Foster (in Robinson 2001) and it can be attributed to the limited information processing capacity of WM. Task difficulty will result in slower processing, and in less accurate and less complex utterances in productive tasks. Levels of performance may be attributed to individual differences as well as to task characteristics.

The most basic result of task complexity is that the more attention learners have to pay to content, the less attention they will pay to language, emphasizing meaning may be detrimental to accuracy. This certainly explains the gradual shift of TBLT from meaning-based learning to form-focused instruction. However, L2 acquisition has been shown to be incomplete (see chapter 3) and performance on particular tasks can, at most, advance L2 development in some features, not all.

Feedback

As has just been seen, feedback must take into account the curriculum, task objectives and characteristics, learners' initial level of proficiency and individual characteristics.

Feedback at a Distance

Feedback has already been described in this book. It is one form of reactive mediation. Proactive mediation will be displayed in the environment (including support), the tasks and their instructions. Peers can provide mediation in the form of scaffolding, and this can be proactively implemented. However, feedback, and immediate feedback will be important for the learners. In interactive tasks, feedback can be incorporated in the responses of the various interactants, but the validity of this

feedback must be assessed. There is still a lack of empirical studies that show a direct link between negotiated interaction and L2 development. In addition, CLT has highlighted the fact that communication is effective even when morphosyntax or phonology do not conform to L2 norms (see chapter 3).

Rees (2003) shows the efficiency of peer feedback, whereas Aimard (2005) and Grosbois (2006) highlight some of its limitations. The limitations are not serious and can easily be overcome once they have been uncovered, either by more adequate instructions or by recourse to specific micro tasks or tools. In the case of increased phonological nativization, for instance, when input is provided in written CMC formats (Grosbois, 2006), sensitization to the phenomenon, some micro task practice, and recourse to such tools as *text-to-speech* or online pronouncing dictionaries are enough to control the problem. However, such problems should be noticed and action research instruments, when included in the course design, often prove extremely useful and unobtrusive. Assessment, which will be dealt with further in this chapter, is an area of great concern in many educational contexts.

In some educational cultures, 'correction' (immediate recasts) of 'errors' is believed to be very effective (for conditions of effectiveness, see chapter 5), and great amounts of such feedback will be expected. In such instances, and in less demanding circumstances, feedback could be facilitated by adapted computer-technology-based techniques. Such techniques will meet conditions of 'instrumentation/instrumentalization' in order to be effective, as described in chapter 7. Feedback necessitates some form of monitoring and an adequate balance must be found to avoid annoyance and demotivation.

Research will show how techniques can provide effective feedback: automation and personalization may reveal less contradictory than has been thought so far. Automation will deal with process assessment more easily than with product assessment. This may not be a problem as some research results show that assessing the process and providing advice on the process leads to improvement of the product (Narcy-Combes, 2005). These results will have to be validated in different learning contexts. Assessment of product is more than 'error correction', and in most cases, suggesting adapted sequences of macro and micro tasks will be more effective than giving detailed feedback of errors and, in the long run, more motivating

Monitoring

From a very practical position, monitoring will have clearly defined objectives and will be considered from a pragmatic perspective (White, 2003 and Bertin & Narcy-Combes, 2007). It raises a number of questions:

- What are its intended outcomes?
- What theoretical concepts are implied?
- How can interaction and task performance be measured?
- How can large groups be monitored and provide individual data?
- How can indicators be defined?
- How can the data collected be turned into useful comments?

Lamy & Hampel (2007, p. 70) remind us that sociocultural features such as verbal learning, private speech, access to ZPD, etc. will be taken into account, which will require defining specific indicators.

Informal monitoring will be provided from scaffolding, collaborative dialogue, and instructional conversations. This implies having a clear view of motives, goals and operation of activities, so as to detect the indicators.

Our experience (Bertin & Narcy-Combes, 2007) is that it is easier to monitor work techniques than product. Feedback can then not only be in terms of level of proficiency, of the most disturbing

features to be practiced in micro tasks, but also on how to work more efficiently and on what to do next. When output is consequent, feedback on process is not as de-motivating as feedback on product since it concentrates on what matters most and not on every detail. This approach to monitoring will go against traditional beliefs in some educational contexts. Learners however quickly realize the pertinence of the approach if feedback is consistent and immediate.

Monitoring should be considered in terms of the relations at work in a learning environment, which will depend on the theory (or theories) we refer to (see Figure 19 in chapter 1: a regulation sub-system).

Taxonomy of Tasks

Types of tasks will be selected in relation to the objectives assigned to each task (implicit or explicit processing, approach, timing, specific focus, type of material, similarity with real-life tasks, etc.). In order for the learners to reach the objectives, a combination of features will be selected. The "features" columns of Tables 2 and 3 in chapter 1 can be completed by information from Lamy and Hampel (2003, p. 69) and include:

- information, opinion or knowledge gap required;
- two-way information gap;
- closed outcome;
- non- linguistic outcome;
- heuristic tasks;
- problem-solving tasks;
- unfamiliar task;
- human/ethical topic;
- narrative discourse (vs. description/expository writing);
- context-free work, involving detailed information.

Different types of tasks will be listed and classified in the following paragraphs in relation to their potentialities in the model. More detailed descriptions can be found in Willis and Willis (2007), for example.

Micro Tasks and Type A Macro Tasks (Listening and Reading)

These tasks designed for creating learning needs and integrating phonology, lexis, grammar, etc., include:

- tasks involving listing;
- tasks involving ordering and sorting;
- tasks involving matching;
- sequencing;
- rank-ordering;
- classifying;
- tasks involving comparing and contrasting: finding similarities or differences;
- problem-solving tasks and puzzles;
- identifying items for a focus on form;

Very complex meaning can be processed in such tasks without any output. Micro tasks and type A macro tasks will differ in their amplitude, the time allocated, the amount of resources, etc. since they do not have the same objectives.

Type B Micro Tasks

These tasks are designed for developing automaticity (listening, speaking or writing. They may rely on forms of "drilling" but with quick meaningful decisions, and therefore choices, to be made in order to practice managing the gap, such as answering questions according to animated cartoons, which impose the choice of a preposition (*in, into, or to*) according to the context presented in the cartoon. Such meaningful "drilling" has little in common with audiolingual drilling. Action research can help measure how efficient it is and if it is well received. Such micro tasks can deal with grammatical, lexical, phonological, conceptual or cultural points that may be

problematic for each individual learner. They will require specific development expertise (Arthaud, 2007), cf. chapter 10.

Other forms of drill work involving choices can be proposed, even in writing form. Attention must be paid to timing, repetition and length, in order to provide the necessary practice (in relation with cognitive theory). Some learners may be keen on such practice, while others very reluctant, and Arthaud (2007) shows great variability among learners. Tutors will remember that certainty on the validity of such drill work is still questioned in some circles before making it mandatory. Khreim (2008) showed that too much micro task work on one problematic point (phonology) was detrimental for other points (grammar): a valid balance will be negotiated with the learners.

Type B Macro Tasks and Some Ttype B Micro Tasks

These are complex tasks that will generally require output and often collaborative work:

- projects and creative tasks;
- sharing personal experiences/reporting;
- discussion tasks;
- prediction tasks;
- jigsaw task sequences;
- games based on classified sets;
- visual supports: charts, tables, mind-maps, etc. ;
- charts and tables;
- mind maps;
- timelines and storylines;
- integrated reading and writing.

Some of these tasks can be designed by the learners themselves, once pairs or groups have been set, if instructions are carefully worded and include a clear description of what the task is about, of how to collect the material and of how to go about completing the task, such as:

Select one article each on a topic you have agreed on/the tutor has chosen, then report to your partner who will not know where your article comes from. Detect opinion or information gaps in the two articles, write a report and send to tutor and partner, or make an oral report and send to tutor or partner. Confront results in feedback session.

One major problem in such an approach is the need for a common language for the instructions which can be designed to trigger implicit focus on form as seen above.

Specific Tasks

Academic and professional tasks, including note-taking, reports, abstracts, oral presentations, etc., may be required by institutional curricula. They can be seen as learning tasks if initial attention is paid to process and not to product. Specific instructions may be given for each task in order to cover a curriculum (see above). Abstract writing tasks have already been described and a course on scientific oral presentations will be presented below.

CMCL Settings (Table 9)

CMC for languages promotes socio-collaborative tasks (Lamy & Hampel, 2007) and therefore offers ample opportunities for differing perspectives and opinions, for controversy resolution and consensus building. Increased participation and interaction will lead to the creation of an authentic community in which roles for learners and teams of learners will emerge. Such an interactive environment leads to greater awareness of the forms and functions of the L2 used. Reference to Lamy and Hampel (2007) and other publications will provide more information; the tools will only be studied here in reference to how they can be used within the model. CMC tools can provide forms of macro tasks (particularly type B).

Table 9. CMCL settings

Tools, systems or tasks	Affordances and problems
Chats	They provide synchronous communication in the form of written discourse which is often described as similar to oral discourse. This is partly validated, but written output results from different processes than oral output (cf. Chapter 4) and the effects of the written mode have been shown to affect phonological nativization of the words acquired in such interaction (Grosbois, 2006), this will also be true of forum discussions. Compensatory tasks should overcome these effects. Task instructions will enhance negotiation of meaning by reducing topic or form avoidance.
Forums	They provide asynchronous communication and are low-tech tools. The threaded written discussions leave time for preparation and rehearsal (which is positive (see chapter 4). Discussions should be included in the curriculum with specific instructions. Monitoring is relatively easy to carry out in order to increase potential outcomes which are still limited (Lamy & Hampel, 2003, p. 112). Commentaries applying to chats apply here as well (phonological nativization).
Moos	• They have a complex architecture; they provide a motivating spatial metaphor and graphical-cum-textual possibilities. Research results (Aimard, 2006) show that acquisition is limited if no defined instructions as to roles and actions are provided, but this can easily be overcome. Sound-based interaction will be more beneficial.
Virtual worlds	• They (Chanier, 2002) are comparable to Moo's in what they provide and in what could increase L2 development.
Videoconferencing	Apart from complex planning requirements, it offers a number of positive options. The sessions can be integrated within a wider pedagogical framework (Lamy & Hampel, 2007, 139) and they can be prepared and exploited by other tasks, which gives them a structuring and motivating role. Instructions as to themes, materials and activities should be carefully devised in relation with the curriculum, learner level and individual characteristics. Correction and feedback are not appropriate during the videoconference, but the exchanges can be recorded and used for post-session feedback.
Blogs	They require learner training and integration with other activities. They lead to the collaborative construction of knowledge. Creative and reflective benefits may result from such work. Unobtrusive instructions might lead to more acquisition.
Wikis	They are collaborative web sites which comprise the perpetual collective work of many authors. They resemble blogs, but in wikis anyone can interfere with the content that has been placed on the site. Both blogs and wikis require technical supports for teachers and learners alike. Careful attention will be paid to the instructions, and feedback will be complex to handle. Blogs and wikis increase the role of learners as course designers and make the role of the tutor more complex in his or her assessment of the knowledge created (epistemological responsibility, see chapter 4)
Mobile devices	Mobile devices have long been used (e.g. walkman, see Narcy-Combes, 2005), but electronic devices certainly provide more scope and flexibility. Instructions and feedback will also be more complex to provide. Incidental acquisition is very likely to be high, means of overcoming unperceived effects of nativization can be suggested after feedback sessions which can include discussion of the best ways of using these devices

Although the potentialities of these CMC affordances are very attractive their actual potential must be carefully assessed in order to provide adequate instructions and feedback.

A Practical Example: CSOA, from a Blended to a Distance Course

CSOA (Tables 10 and 11) is the French acronym for *scientific oral presentations in English*. It is an experimental (action research) course for Master and PhD students in linguistics, applied linguistics or psycholinguistics (Narcy-Combes & Narcy-Combes, 2007, Bertin & al, 2009). It corresponds to an initial face-to-face course of twelve 90–minute sessions in a term of 12 weeks.

Each of the stages can be justified by referring to the theories described in this book. Due to their field of research, the learners are sensitive to this theoretical framework. The cognitive work of the earlier stages is accepted because the final stage is a real-world activity that leads to scientific exchanges both with the other learners and with the tutor, who is a specialist of the field as well in

Table 10. From a blended course in Academic English to a distance course

	Present Organization
Initial session	Tutor-led introduction to the course
	Virtual resource center available
Stage 1	Learners select a research article in their field
Stage 2	Learners turn the article into a very detailed plan (titles, headlines, subheadings, etc.), they e-mail it to tutor who sends feedback in return
	Second meeting with tutor: feedback and suggestions of micro tasks
Stage 3	Powerpoint presentation sent to tutor; who sends feedback in return
Stage 4	Rehearsed oral presentation e-mailed as audio attachment to tutor, who sends feedback in return (advice on how to cope with phonological problems and linguistic, or conceptual problems as well, such as recourse to *text-to-speech*, or other tools, practice tasks in language laboratory or online (virtual resource center, etc.)
stage 5	Final presentation to a group of no more than 12 learners and debate.
	Sequence repeated a second time

Table 11.

	Adjustments for Distance
Virtual resource center	Web-based platform
Forum	Peer mediation: affiliation, debate and support.
Videoconferencing	Presentations and collective debate on each presentation (interaction that gives face validity to the course and triggers learning).

this particular case. Results are positive, learner satisfaction measured anonymously is high and the second presentation is of better quality than the first one (process and product). Phonological nativization (Grosbois, 2006) is not totally overcome and the reading source of the input can be felt in some presentations.

The amount of work required of the learners is quite substantial and they actually spend many more hours than the 18 hours that are allocated to the course. Some form of monitoring would be beneficial, especially if the course were to attract more learners.

The reading techniques, the transformation of the article into a detailed series of titles, and the designing of the Powerpoint presentation could be monitored and feedback sent to the teacher and learner (which techniques are not effective, errors not dealt with, etc.). One could think that, for instance, words or phrases that are likely to be difficult to pronounce for a French speaker of English could be indicated with suggestions of practice. A research project is currently under way including the use of teaching agents to see how this could be implemented. (Bertin, Gravé & Narcy-Combes, 2009).

The course will soon be available as a distance course on a web-based platform. Videoconferencing sessions will replace the face-to-face sessions when the presentations are actually given, which will maintain the possibility of collective debate. The videoconferencing sessions will structure the course (Lamy & Hampel, 2007, p. 139 and above) and will give face validity to the work done by the learners, the availability of a forum will maintain affiliation.

ASSESSMENT

Assessment is a key component of learning environments (see chapter 10) which is always addressed last in SLA or didactic research.

Formative vs. Summative Evaluation

Formative evaluation provides feedback on the teaching/learning process while summative assessment comes at the end of the course or of a unit. Formative assessment provides information on learner progress and course effectiveness. Tutor assessment will measure effects of insufficient e-literacy and imbalanced workload in order to control the risk of drop-outs (Lamy & Hampel, 2007, p. 97).

Nowadays, especially in Europe, certification is not the responsibility of the course staff, which is a positive thing since course tutors are no longer in charge of it and will feel freer in their formative comments, especially when progress is not sufficient despite the learner's involvement.

Summative assessment may remain more concerned with the product as defined by the curriculum, whereas formative evaluation will measure process as well as product, especially as assessing exclusively the product may not reveal progress in the process (Lamy & Hampel, 2007, p. 93). Assessment may be discipline-based, in the case of CLIL courses for instance, as well as language-based (levels of proficiency). It may also be competence-based.

Collaborative work provides other forms of assessment (Lamy & Hampel, 2007 or Rees, 2003) and eventually, the individual learner, peers or tutors can participate in formative evaluation.

Self-evaluation is connected with self-directed learning (Candas, 2009, Esch, 2001), it can be transferred easily to distance courses, and so can the tools that have been used once they are adapted to the new circumstances.

Peer formative assessment is more problematic. It will have a motivating role and alleviate the sense of isolation. However, cultural attitudes and limited time to build up confident relationships may limit its role in the shorter courses.

Fraud is a particularly sensitive aspect of assessment in distance settings (identity substitution, plagiarism, copy and paste, etc.). External certification is one way of coping with fraud, since results in the course are independent of certification.

Process and Participation

Participation can be measured quantitatively by looking at the number of tasks or assignments submitted, the number of exchanges with tutor, peers, or support services, and the number of connections to the platform or resource center and the duration of each connection, etc. Lamy & Hampel (2007, p. 95) define criteria for measuring participation which will be summarized here:

- task performance (individual and collective process and product, involvement and self-evaluation);
- group functioning (group dynamics, balanced participation, atmosphere and efficiency of collaboration);
- social support (individual and collective commitment to collaboration and trust, individual and collective social support and conflict resolution attitude).

These criteria (especially those related to task performance) will be based on the theoretical demands of second language acquisition (chapter 4). Non-participation and receptive-only participation, which is not possible in learner-designed courses, may conceal a certain amount of work which cannot be assessed.

Assessing the Course

Assessing the course is of paramount importance (see chapter 10), it is often worthwhile combin-

ing a mid-term assessment and an end-of-course questionnaire. Learners have more interesting comments when they feel these comments still have an influence on the course, but end-of-course questionnaires will show how they respond to the whole course. Assessing learner response at the onset of the course is useful since it highlights what the learners find clear and what is still problematic. But beliefs have not yet been adjusted and learners may express their needs more vigorously than they will later. A forum is likely to prove useful at this early stage.

Assessment of the course will concern all its aspects, closed questionnaires can prove less threatening for learners and staff as well (a box can be left open for comments). Anonymity is crucial.

SYNTHESIS

This chapter has dealt with the practical side of implementing second language distance courses in a task-based approach. Table 12 will provide a synthetic recapitulation of its content.

Research and development never seem to stop and no sooner have researchers and developers ended their work that they feel the need to add to it. New trends are available, and twitter has not been mentioned in this book. This chapter will be concluded with a look at the future which might prove outdated before the readers get a chance to peruse it…

THE FUTURE

The concept of the learning space (Selinger, 2000, in White, 2003, p. 215) as an online environment in which the content of the course is constructed and developed by participants, as they interact and collaborate on particular topics or tasks, remains an appealing solution.

Distance courses with a web-based platform provide the facilities theory requires:

- access to platform resource center (micro tasks, macro tasks or instructions to design macro tasks, and course information, orientation and support services: library resources, and other supports);
- course content (text, audio, video, graphics, simulations, integrated with tasks and interactive elements) (synchronous or a-synchronous, e-mail, chat, discussion groups, bulletin board);
- collaborative or individual tasks (submitted electronically, group and individual electronic feedback);
- interaction with tutor or peers (e-mail, computer or videoconferencing, electronic bulletin boards and chat);
- assessments and testing;
- course management (learner records, course evaluation, details of learner progress).

The links between these elements (the arrows in our model) have been described throughout the book and suggestions on how to operate them, based on research findings, have been offered. These suggestions will have to be validated (action research), but multi-referenced theory is a safeguard (epistemological responsibility).

Such environments can cater to learner-designed courses with fluid content on the one hand, and to technologically monitored work when the need arises on the other hand. Metaphorically, they can be presented like physical campuses or schools.

These potentialities are motivating. The '*Big Brother overtones*' (White, 2003, p. 225) arising from such dependence on technology can be counterbalanced by learner-centeredness and awareness of epistemological responsibility on the part of institutions, teachers and learners. The model described in this book requires further

Table 12. Synthesis of chapter 11

Definition of tasks	A task involves real world meaningful processes of language use in any or all of the four language skills. It has a clearly defined socially realistic outcome, it triggers cognitive processes and involves the learner personally (individual outcome) in an interaction.
Why tasks?	Linguistic syllabi are not effective in promoting acquisition because they do not conform to acquisitional processes, whereas TBL corresponds to our understanding of what language is. The learners' experiences within language create a natural context which is personalized and relevant for them.
Evolution of tasks	The task-based learning tradition has moved from an emphasis on negotiation of meaning to an investigation of a number of issues related to Form-Focused Instruction (FFI, see chapter 4). The action-based approach has remained purely interactive so far.
Action-based approach	The aim is to engage in collective actions both in the classroom and in the real world.
TBLT	Content is specified by holistic units of communication, i.e. tasks, and by pre-selection of linguistic items. Tasks will be devised so that learners need to attend to form(s).
Macro and micro tasks in a dual learning cycle	The cycle consists in the combination of two cycles based on two types of tasks used simultaneously. Macro tasks are real-world tasks. Micro tasks result from cognitive or constructive hypotheses that assume that the results of practice can transfer to real life activities.
Online course model	The model described in the book can fit most models, but web-based delivery is the best-adapted mode.
Guiding principles	Flexibility in course design goes with a number of principles to ensure that the course runs smoothly and that learners feel they are supported, encouraged and advised in ways that are coherent with their characteristics and the objectives of the course.
Movement from the curriculum to the syllabus and course design	Flexibility means that constant checks have to be made to ensure that learners are covering the content of the course. Adjustments will be suggested.
Thematic content	The materials are determined and collected according to situations and themes set in the curriculum. The tasks will be designed or suggested as a compromise between the learning opportunities provided by the material, the curriculum and the present level of proficiency of the learners.
Linguistic content	The linguistic content will be determined by the requirements of the curriculum, the pedagogic purpose of the course and the specific problems the L2 presents for learners with a given L1 or language learning experience.
Learner as course designer	The advantages of empowering learners with the design of the course and of the tasks may be facilitated by support tools and unobtrusive instructions.
Task sequencing	It can be accomplished based on criteria of complexity, 'chronological'ordering or conceptual difficulty.
Task classification	Two ways are suggested by Ellis (2003): *First approach: kind of activity they require the learner to do- language skill they focus on- kind of discourse they are intended to elicit- input material they involve.* *Second approach: pedagogic classification based on pedagogical procedure/skill required of learners - rhetorical classification based on different discourse domains or different genres- cognitive classification based on cognitive operations different types of tasks involve- psycholinguistic classification.* Teachers must analyze the curriculum in terms of the different categories described: expected activities, skills, discourse, cognitive operations, linguistic and pragmatic content.
Taxonomy of tasks	Types of tasks will be selected in relation to the objectives assigned to each task (implicit or explicit processing, approach, timing, specific focus, type of material, similarity with real-life tasks, etc.). In order for the learners to reach the objectives, a combination of features will be selected. Type A or type B tasks will not rely on the same features, and micro tasks may require specific development expertise as will CMCL-based macro tasks.
CMCL settings	They provide useful and motivating macro tasks. Instructions need to be carefully devised. Feedback will have to be carefully implemented in order to suggest micro tasks if and when necessary.
Assessment	This is a key element in distance learning, especially if the environment is seen as an organizing circumstance. Collaborative work can supplement tutor assessment and self-evaluation has a role to play. Regular assessment of the course can help in adjusting to the needs the course has created.

research in order to be implemented to the fullest of its capacities, but in spite of its technological orientation, it will be effective only if 'freedom to learn' is felt as its major characteristic.

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APPENDIX

Content of a Resource Center

Since the micro tasks can be found in a great many sites, monitoring the learners will depend on the facilities of each site, and teacher feedback will be restricted to a response to what the learner reports.

Welcome to the English Resources Webpage

Here are a few links to help you improve your English language skills.

IDENTIFY YOUR OBJECTIVES

Common European Framework of Reference for Languages

COMPLETE CHART IS DISPLAYED HERE ON THE SITE

• **Grille des critères d'évaluation de l'oral du CECRL => voir le niveau B2:**

http://www.coe.int/T/DG4/Portfolio/documents/sixniveaux.pdf

TEST YOURSELF

• **CECRL: s'auto-évaluer:**

- En ligne: http://www.dialang.org/french/index.htm

- Version papier (en français): http://www.coe.int/T/DG4/Portfolio/documents/appendix2f.pdf

- **Version papier (en anglais):** http://www.crdp.ac-caen.fr/didier/portfolio/pdfs/PortfolioEN-spokeninter.pdf

MISCELLANEOUS B2 RESOURCES

• Annales du CRPE:

- http://www.crdp.ac-lyon.fr/a/ConcoursEdu/Sujets_CRPE_Lyon.html

- http://pedagogie.ac-montpellier.fr/disciplines/anglais/primaire/

- http://www.ac-aix-marseille.fr/public/jsp/site/Portal.jsp?page_id=454

- http://pedagogie.ac-montpellier.fr/disciplines/anglais/primaire/CRPE2006_Clermont.pdf

• Annales du baccalauréat général (Anglais Langue Vivante 1 en fin de terminale = niveau B2):

- http://pedagogie.ac-montpellier.fr/disciplines/anglais/ressources/sujets/

- http://anglais.free.fr/sujets/index_sujets.html

- http://www2.ac-rennes.fr/crdp/doc/docadmin/Examens/Diplome.asp

LANGUAGE SKILLS

Speaking skills

I-/ Vocabulary:

- http://dictionary.cambridge.org/ Cambridge dictionary online

- http://atilf.atilf.fr/dendien/scripts/tlfiv4/showps.exe?p=combi.htm;java=no Trésor de la Langue Française (French dictionary online)

- http://www.alphadictionary.com/index.shtml Look up for a word in 150 dictionaries at the same time !

- http://www.granddictionnaire.com/btml/fra/r_motclef/index800_1.asp French-English / English-French dictionary online

- http://www.peak.org/~jeremy/dictionary/chapters/title.php

American-British / British-American dictionary online

- http://www.phrases.org.uk/index.html English phrases, sayings and idioms

II-/ Phonology:

- **http://fonetiks.org/ Online pronunciation of 9 varieties of the English language (American English, British English, Irish English, Scottish English, Welsh English, Australian English, Indian English, Canadian English and South African English).**

- http://howjsay.com Enter a word and the computer will pronounce it for you !

- http://en.wikipedia.org/wiki/IPA_chart_for_English International Phonetic Alphabet (IPA) => get to know the pronunciation symbols

- http://www.paulmeier.com/ipa/diphthongs.html Click on a diphthong and the computer will pronounce it for you !-

- http://shiporsheep.com/ Online pronunciation of minimal pairs. For example ship and sheep.

- http://efl.htmlplanet.com/phono.htm Various phonological diagrams (notably the [ð] (as in *father*) and [θ] (as in tooth) sounds)

- http://efl.htmlplanet.com/tongue_twisters.htm Various tongue twisters to practice and to listen to !

III-/ Grammar:

A-/ lessons (first things first)

- http://www.edufind.com/english/grammar/subidx.cfm Grammar lessons (in English)

- http://www.e-anglais.com/cours/index.html Grammar lessons (in French)

- http://pagesperso-orange.fr/jean-claude.guegand/jeu1.html Grammar lessons (in French)

B-/ exercises (=> test yourself)

- http://www.smic.be/smic5022/ (follow "activities to do online" and click on "grammar and dictation") Grammar exercises

- http://www.e-anglais.com/exercices/index.html Grammar exercises

- http://a4esl.org/q/h/grammar.html Grammar exercises

Reading skills

I-/ Literature, poetry, short stories, comics...:

- http://digital.library.upenn.edu/books/ Free books online (University of Pennsylvania)

- http://shakespeare.mit.edu/ William Shakespeare's complete literary work online

- http://www.short-stories.co.uk/ Online short stories

- http://www.eslreading.org/index.html Various reading resources online

- http://www.abebooks.com/http://www.bookfinder.com/ Cheap books for sale

II-/ Newspapers online:

⇨ *British newspapers*

- http://www.timesonline.co.uk/tol/global/ The Times

- http://www.guardian.co.uk/ The Guardian

- http://www.telegraph.co.uk/ The Telegraph

- http://www.iht.com/pages/index.php The Herald Tribune

- http://www.bbc.co.uk/learning/ BBC Education

⇨ *American newspapers*

- http://www.washingtonpost.com/ The Washington Post

- http://www.usatoday.com/ USA Today

- http://www.latimes.com/ The Los Angeles Times

- http://www.reuters.com/ Reuters

- http://www.nytimes.com/ The New York Times

- http://www.newsweek.com/id/38202 Newsweek

⇨ *Irish newspaper*

- http://www.ireland.com/ The Irish Times

⇨ *Miscellaneous*

- http://www.expatica.com/fr/main.html French news in English !
- http://newspaper-world.com/ and http://www.newslink.org/news.html Newspapers from all over the world

Understanding skills

I-/ Audio resources:

·⇨ *Literature*

- http://wiredforbooks.org/index2.htm Books to listen to
- http://www.poetryarchive.org/poetryarchive/teachersHome.do Poems to listen to
- http://www.ipl.org/div/kidspace/storyhour/goose/index.html Children's stories to listen to

⇨ *News*

- http://www.breakingnewsenglish.com/ Press articles to listen to with scripts
- http://www.voanews.com/specialenglish/index.cfm **Press articles to listen to with scripts**

⇨ *Movies*

- http://www.moviesounds.com/matrix.html Film extracts with scripts

⇨ *Exercises*

- http://www.dictationsonline.com/ Dictations online (dictées)
- http://pagesperso-orange.fr/merryprof/co/index.htm Gap-fill activities (textes à trous)
- http://www.esl-lab.com/ Listening-comprehension exercises

II-/ Internet radio stations:

- http://radiostationworld.com/ radios from all over the world
- http://www.world-english.org/listening.htm radio from many English speaking countries
- http://www.abc.net.au/radio/ Australia
- http://www.sabc.co.za/portal/site/corporate/ South Africa
- http://www.radionz.co.nz/# New Zealand
- http://www.npr.org/http://www.voanews.com/english/index.cfm USA

III-/ Videos online:

⇨ *Video News*

- http://news.bbc.co.uk/2/hi/video_and_audio/default.stm US news with script
- http://www.thedailyshow.com/ US news
- http://www.bbc.co.uk/worldservice/learningenglish/index.shtml British news

⇨ *Television online*

- http://beelinetv.com/ TV channels from all over the world

⇨ *Miscellaneous*

- Audio & video great speeches: http://www.history.com/media.do
- Famous speeches & movies (with scripts): http://www.americanrhetoric.com/MovieSpeeches/moviespeechgandhi3.html

Writing skills

Tips to improve your writing skills: http://essayinfo.com/

Cultural background

- http://pedagogie.ac-montpellier.fr/disciplines/anglais/civilisation/ (UK, US, Ireland, Australia)
- http://www.sterlingtimes.co.uk/englishness.htm Great Britain

- http://www.woodlands-junior.kent.sch.uk/customs/questions/index.html Great Britain
- http://www.visitdunkeld.com/welcome.htm Scotland
- http://projetalbion.free.fr/civi.html Great Britain & USA
- http://news.bbc.co.uk/1/hi/country_profiles/default.stm Details covering all the countries in the world
- http://classbrain.com/artstate/publish/ Details about the 50 states of America

Goodies

- **Find out about your learning style (visual / Aural / Kinesthetic...):** http://honolulu.hawaii.edu/intranet/committees/FacDevCom/guidebk/teachtip/vark.htm
- **Tips to deal with public speaking (in French):** http://www.3ct.com/ridf/construire/professionnaliser/modalites%20de%20professionnalisation/choisir%20des%20dispositifs%20pedagogiques/stages/guides/formateur%20sciences%20humaines/prise%20de%20parole%20en%20public/prisedeparole.htm#LE%20REGARD
- **Tips to deal with public speaking (in English):** http://www.public-speaking.org/public-speaking-articles.htm
- Free web-based email service to coach you in English http://www.gymglish.com/www/fr/produit_formation_professionnelle_elearning_langue_anglais

Contact the webmaster cedricbrudermann@gmail.com Last update 2009/09/19.

Chapter 12
Conclusion

In the preface, the authors introduced the research that has led to this book as resulting from a combination of social, political, didactic and pedagogic pressures. The industrialization of knowledge was seen as a challenge that went with the end of the prevailing amateurism in the design and development of online materials and environments.

Irrespective of the forms they take, considering such environments as psycho-social constructs entailed the necessity to problematize the use of ICT for language learning purposes. On the one hand, this meant understanding the nature of ICT and distance as well as the nature of their relationships with the various components of the language learning situation. On the other hand, it meant providing suggestions for the design and development of soundly constructed environments.

Such questioning therefore involved revisiting accepted theories in traditional language learning settings and reassessing the roles of the various actors, as well as making sure that no component would remain unnoticed.

A need emerged for a comprehensive conceptual framework offering a better grasp of the complexity of the situation. Traditional analytical descriptions of language learning are based on typologies that help identify the actors and components involved in distance language learning but that do not necessarily take into account their dynamic nature. As a result, such descriptions tend to be prescriptive and often fail to reflect the changes brought about by innovations of all sorts (such as technological or pedagogic), by socio-organizational changes or by their own dynamic nature.

Interactionist theories of complexity help us form a more refined representation of these dynamic dimensions but they fail to take into account the retroactive effect of interactions on the initial natures of the actors, elements which a systemic

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perspective does take into account. The authors adopted this approach which also provided a coherent vision of the actors and of the process (language learning) which defines the orientation of all interactions.

In this light, the initial questions turned into the ergonomic question of how to ensure that the learning environment can work efficiently. The reference to industrial ergonomic models rapidly proved unsatisfactory and outlined the original position in which human actors are placed in relation to the instrument. The concept of didactic ergonomics was developed leading to a model designed as a guideline for the observation and discussion of distance language learning.

Because this didactic ergonomics model is integrative, it remains in line with the authors' initial epistemological position based on non-figurative realism (Chalmers, 1987) and acceptance of uncertainty (Morin's complex thinking). Its interactionist perspective provides more elaborate descriptions of the language learning situation which is not seen as the mere juxtaposition of components but as an interactive system. The systemic stance facilitates the assessment of the effects of the dynamic dimension: changes are more easily anticipated and thus resistance to developmental progress due to innovations is more likely to be overcome. This model is not a predictive model. Prediction would mean anticipating on the results, which is not feasible in such cognitively complex situations. The approach remains comprehensive: the purpose is to understand in order to react, to design, to plan transfers and adaptations to different contexts.

Epistemological obstacles (mainly professional experience and pseudoscience) can be overcome since making use of the analyzer effect uncovers what usually remains implicit and referring to scientific evidence will reduce the risk of pseudoscience. Adopting a systemic approach leads to a chain reaction: the adoption of innovation and distance affects the learning process and generates new types of interactions, which, in turn, cause new roles to emerge and new requirements to be defined in order to ensure the integration and adoption of innovation and distance in and by the various specific contexts. New modes of organization will generate changes in the engineering approach creating new needs to be met in initial and in-service training of the various actors.

Chain reactions cannot be fully monitored if complex thinking is not acknowledged: humans cannot describe, observe, nor even understand all the individual interactions in the system (the number of crystals of the kaleidoscope makes it impossible for one individual to take them all into account). It is advisable to implement systems that can partly compensate for the fact that everything cannot be planned, that nothing is really linear and that reorganizing the systems according to the circumstances is what really matters.

At the same time, our investigations have shown that distance cannot be considered as just a new dimension superimposed on the computer-mediated language learning environment.

The multidimensional nature of distance initiates a process of distanciation in the observer himself who has to make explicit what could be left implicit in traditional situations. Distance in other words is not another component of the system but an analyzer of the system. While an analytic approach considers each set of theories as irrevocably distinct, the didactic ergonomics approach to distance language learning tends to 'lower the epistemological barriers' between them.

Interdisciplinarity proved extremely resourceful, especially in the contribution of psychosociology. This scientific field opens up new vistas to the teacher or researcher in second language learning environments. The analyzer concept revealed what was implicit or invisible in language learning. The model presented in this book and its applications went with a reassessment of theories. What is proposed is not only valid for distance language learning but is also applicable to the three dimensions of mediation outlined: face-to-

face or classroom situations, computer-mediated situations and of course distance learning with an increased understanding of the complexity of the role of the context.

The theoretical construction of the model originated in the recognition of its complexity, as did the ensuing design, implementation and operation of the environments leading to new conceptions of engineering and to the more practical consequences of a task-based approach in distance second language learning environments. Accepting the complexity of the phenomena and turning to interdisciplinary approaches go with a lowering of epistemological barriers since beliefs are constantly questioned from a different perspective.

In such an approach, action research will ensure the validity of the link between theory (modeling) and practice and uncover some of the unseen obstacles. Some of the fields involved in the scope of this book still require more investigation. The book is meant for all actors involved in language learning whether they be on the practitioners' side or on the researchers' side but reflective practice in the form of action research is a safeguard.

Implementing the model in a given environment requires taking an adequate perspective of the various poles while assessing the individual dimension of each pole as well as of the process and how this is going to be affected by the context. In order to achieve this, two points must be clarified:

- the way the actor as researcher and/or practitioner views language, the theories of language learning and acquisition and their methodological implications;
- the approach of uncertainty linked to the flexible and evolving nature of both technology and context.

As shown in chapters 10 and 11, innovations must be analyzed, prepared and supported by means of specific schemes adapted to each situation. To be efficient (i.e. to favor the process as defined by ergonomics), the system must adapt to:

- the institution;
- the learners;
- the educational community (teachers);
- the available technology (including the necessary choices among the vast range of options).

Because interactions and uncertainty are accepted, the value of the model corresponds to its adaptability to fit these various specific situations.

The approach followed here does not lead to a syncretic construction but to an acceptance of the fact that since there is no unifying paradigm, the crystals have to be organized in a coherent way, as required by the context, and the validity of the construction constantly put to the test of validation. This is the only position that can make the kaleidoscope acceptable.

An illustration of this position is the construction of the learning cycle. Initially, it seemed to be constituted of contradictory theories (socio-constructivist macro tasks and cognitivist micro-tasks). In a purely analytic approach, this model would be questionable even if empirical data do not invalidate either of the theories. The perspective taken in this book makes it possible to combine both approaches, while making sure that further action research needs to be conducted in order to determine to what extent it is acceptable.

The model is not prescriptive; it opens up new horizons by integrating the variable nature of the poles and the principle of uncertainty. It is conducive to a fluid, learner-centered and finely mediated approach to distance second language learning, which also deals with the more cognitive elements of learning an L2, and interestingly, distance as an analyzer clearly points to blended learning as a positive alternative to traditional face-to-face environments.

About the Authors

Jean-Claude Bertin is a full professor of English language learning and teaching at the University of Le Havre, France. He is a member of the CNRS (National Center for Scientific Research) unit IDEES-CIRTAI, where he coordinates research in the field of CALL and Distance Learning. He has published a large number of articles and reports in this field, in national as well as international journals, authored the book (*Des Outils pour des Langues – multimedia et apprentissage*, 2001), as well as a contribution to *ICT and Language Learning – a European Perspective* (Chambers, A. & Davies, G. Eds, 2001). He has presented numerous papers in a variety of international conferences, among which several CALICO symposia in the United States. He is now President of the French research association GERAS (Groupe d'Etude et de Recherche en Anglais de Spécialité), Director of ASp journal (Geras, France), and has been reviewer for several scientific journals, among which *Computer-Assisted Language Learning* (Taylor & Francis), *Revue canadienne de linguistique appliquée* (Ottawa, Canada), and *ReCALL* (Cambridge University Press).

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Jean-Paul Narcy-Combes is a full professor of English language learning and teaching at Sorbonne nouvelle – Paris 3 University and deputy-director of DILTEC (didactique des langues, des textes et des cultures), a joint research laboratory of Sorbonne nouvelle University and Pierre et Marie Curie (Paris 6) University. He has authored or co-authored six books including *Apprendre une langue étrangère* (1990), or *Didactique des langues et TIC, vers une recherche-action responsable* (2005) as well as a number of articles in France and other European countries (Britain, Belgium, Germany, Austria, Italy and Spain). He has presented papers in international conferences and has been a keynote speaker in some, including LSP '99 in Brixen/Bressanone, Italy, or CATaC (cultural attitudes to technology and

communication) 2008 in Nîmes, France. He has taken part in European projects (Lingua) and was the scientific co-ordinator of a project (1992-2000) that included some 50 high schools and 150 language teachers in the French Region of Picardie and was jointly financed by the French state and the Region. He has been a consultant with the French Ministry for Education, in particular in projects related to evaluation and certification.

Robert Fischer is Professor of French and Chair of the Department of Modern Languages at Texas State University. He has served as the Executive Director of the Computer Assisted Language Instruction Consortium (CALICO) for 10 years. He has published, presented papers, and consulted widely in the field of computer-assisted language learning and has directed several grant-funded projects in the development and use of multimedia authoring tools for foreign language listening and reading comprehension.

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