An Emergentist Approach to the Evolving Roles of the Teacher in Distance Learning Environments

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Abstract

Distance generates added complexity in language learning due to its various dimensions (geographical, temporal, social, and psychological). This paper considers this complexity from a model-driven emergentist perspective (i.e. a perspective drawn from Dynamic Systems theories focusing on the changes within the systems). After introducing the didactic ergonomics model, the author shows how several subsystems are involved, each pointing to emerging specific roles. He then shows which competences are related to these roles before suggesting a long-term and general approach to teacher and tutor education for CALL and distance language learning.

Keywords: Teacher/tutor, teacher training, teacher education, roles, competences, didactic ergonomics, emergentism.

1. Introduction

The introduction of Information and Communication Technologies (ICT) into language learning environment, especially in the case of distance learning, entails significant changes in teachers' activities (e.g. design of digital materials and computer-mediated learning environments, task design and instrumentation, teaching and follow-up modes…) as well as in learners' practices (e.g. degree of autonomy in learning activities…). CALL literature points to the dramatic evolutions in the various actors' expected activities, especially due to destructured environments (Narcy-Combes 2010) and to the attention paid to learners' individual objectives in the design of (online) learning environments (Colpaert 2010).

A large part of CALL researchers (mainly university level) more specifically focus on the way teacher training is affected by the instrumentation of language learning situations. Among the most recent ones, let us mention Chapelle 2003, Felix 2003, White 2003, Egberd 2005, Narcy-Combes 2005, Hubbard & Levy 2006, Lamy & Hampel 2007, Hubbard (ed.) 2009. Most of these publications are based on empirical studies whose general significance is constrained by the degree of representativeness of the environments described: specific contexts, type(s) of technology used, sample size… Compton (2009) calls for longitudinal studies liable to identify convergences beyond individual situations. Hubbard & Levy (2006) note that the absence of any agreement on what could be called 'good practices' has considerably limited the degree of formalisation of teacher training. Guichon's expected publication (2011) should constitute an interesting contribution in this debate, as well as EUROCALL's Special Interest Group on teacher training[i1].

Identifying CALL teachers' key competences appears to be a prerequisite to professional training insofar as CALL – and especially distance – teaching involves specific skills (Compton 2009, 76). Our assumption here is that a first step should consist in identifying the evolutions entailed by distance learning environments regarding the various actors' roles, notably their didactic and psycho-social dimensions.

Indeed there seems to remain a certain ambiguity in the respective roles of teachers and tutors in both institutional documents (e.g. the Common European Framework of Reference for Languages) and scientific publications where most authors tend to use one term or the other indifferently. For example, Lamy & Hampel (2007, 61) begin a section entitled 'Teachers' roles and skills" by "The tutor..." . Compton (2009, 76) explains this terminological association by the absence of any formal distinction between such words as *tutors*, *teachers* or *instructors*. The confusion may be partly accounted for by the fact that in a large number of contexts these roles are fulfilled by the same physical person. While this terminological association may have no

significant importance in face-to-face teaching (including multimedia laboratories), we feel that these roles have to be investigated more thoroughly in the case of distance learning environments.

French researchers from the social sciences and education operate more explicit distinctions by focusing on the teacher's and the tutor's individual statuses in university contexts and on the need for specific training, without however making explicit distinctions between face-to-face and distance/CALL situations (Annoot 2007). She points to the fact that when ICT is introduced in educational contexts, it rarely questions the underlying traditional teaching assumptions. Innovation seems to proceed mainly from the attention given to the new publics involved in distance learning. Moreover, the initial impact of technology appears to affect the central process mainly (in our case, language learning) due to the destructuration of time and place when distance is concerned. Evolutions in the roles of these actors could therefore be explained more easily by the new publics.

This paper aims at approaching this issue from a theoretical standpoint. In a first part, the author's epistemological stance will be explained in order to justify a model-driven approach to roles. The didactic ergonomics model on which this approach is based will then be rapidly described. Finally, the model will be deconstructed so as to show how various subsystems co-exist, each emphasizing – and defining – the roles of the various actors as well as the related skills required from each. By so doing, the author will suggest guidelines for CALL and distance teacher and tutor training, bearing in mind that this paper will emphasize significant distinctions between these actors in distance learning.

2. Epistemological stance

This paper is based on a two-fold theoretical stance: a systemic and more precisely emergentist approach to language learning environments on the one hand; a model-driven approach on the other hand.

2.1. Emergentism: an approach to complexity

Emergentism derives from Dynamic System theories which offer original approaches to complexity. Considering CALL environments as complex systems can indeed be justified as their main components, namely language, learner and teacher, as well as the process around which these revolve (language learning), are themselves complex constructs. Hence: the complex nature of language (Simondon 1989) and the transductive relationships which help define it (Narcy-Combes 2005), as well as the unstructured nature of discourse which remains adaptive to the various enunciative contexts (see Ellis *et al* 2009 "Language is a Complex Adaptive System").

The language acquisition processes, for which no single theory offers a totally satisfying

paradigm, make it necessary to resort to a variety of theories for the different sets of phenomena observed (Narcy-Combes 2005). Their relationships are themselves sources of complexity as they impact our vision of the roles of the actors involved, in their didactic as well as institutional dimensions.

The complex nature of the two preceding points has recently been discussed by Byram (2011), especially at task level. Narcy-Combes (2010) showed how non-symbolic theories of language contribute to destructure the notion of language and how learning paths themselves are non-linear and unpredictable.

At the level of learning environments, technology remains an unstabilised concept because of the variety of forms it can take and the rapid pace of its evolution, which renders reasoned observation a difficult matter. As a result mediation itself can be seen as a complex concept, entailing a distinction between pedagogical, technological and distance mediations (see below).

Finally, the variety of contexts in which distance learning is operationalised generates further complexity for various reasons. On the hand, indeed, context can be understood as the actual language learning curriculum (micro level), as the institution/university (meso level) or even as the national educational policy level (macro level). Furthermore, complexity is enhanced by the retroactive effect of the technology causing local contexts to evolve (Bertin *et al* 2010).

A traditional approach to complexity has been to reduce a system to its basic components and analyse the nature of each, hence its name reductionism. This approach cannot however satisfactorily account for such complex situations as distance language learning and will be discarded in this paper. Instead, an emergentist stance will be taken as it appears to offer a more stimulating approach by focusing on evolutions within systems (Sockett 2010).

Emergentism considers objects such as they appear in the real world without any artificial simplification or reduction. Three main principles should be highlighted as they will influence our vision:

- the whole (the system) is richer than the mere sum of its constituent parts;

- the system as a whole behaves in a characteristic way, which the simple observation of its constituent parts cannot account for;

- new properties may emerge when a certain level of complexity is reached, while unknown at lower forms of organisation. In our case these properties might/CAN be conceived of in the form of (technological) functions and (human) roles.

The 'emergence' phenomenon necessarily results from self-organisation, without any external intervening factor.

> The concept is especially useful on the ontological level. In this context, emergence refers to the appearance of a different mode of organisation/integration, differing from what can be observed at less complex levels of organisation. (…) Any emergence finds limits on

the temporal and spatial planes. (…) The different levels of organisation cannot be reduced the one to the other as they are autonomous. This involves a major epistemological consequence: the theories applicable to lower levels cannot be extended to account for the more complex levels (Juignet 2010).

Emergentism builds up on former dynamic systems theories insofar as it introduces a temporal element that does not necessarily exist in other approaches to complexity: systems evolve and so does the nature of their emerging properties. This remains in line with Morin's *Complex Thought* as it makes room for uncertainty and unpredictability.

The emergentist stance allows us to predict a number of "things/processes/activities" will take place if the learning environment provides for a sufficiently rich set of interactions. Yet, it offers no certainty as to the exact nature of these emergences and the resulting language acquisition. It allows us to foresee that language learning-related processes will take place while discarding the idea that the teacher's objectives will necessarily be reached.

2.2. Methodological consequences: why resort to theoretical models?

The emergence concept addresses the complexity of the real world's macro-objects. In our case, these macro-objects correspond to computer-mediated / distance learning environments.

Existing empirical studies highlight the diversity of contexts but tend to hinder any overview of such environments as scientific objects. Considering these from an emergentist standpoint requires developing a conceptual approach based on an attempt to identify constants and build appropriate models. In our case, a model will be a theoretical construct synthesising data from field studies and aiming at highlighting how interactions between the poles of the model (the constants) operate and how specific properties emerge from the global system.

The limited scope of this paper prevents us from exhaustively describing how the didactic ergonomics model, on which our approach is based, was constructed out of research action studies and theories (Bertin et al 2010). We will simply describe it rapidly in a first step.

Let us stress the fact that a model in language learning fulfils a number of specific functions and should not be confused with mathematical models.

- It provides guidelines through uncertainty: as one cannot predict what will take place exactly in learning situations, the model helps organise what can be organised in a learning environment.
- The model offers a conceptual framework for the various actors of the teaching/learning situation, in order to make sure that the various concepts related to language, learning, etc. form a coherent whole.
- The model is a guide to construct appropriate (technological) functions and (human) roles within the global environment.
- The model offers the basis for reorganisation of the system when evolutions and discontinuities are identified.

This means that the model can in no way be normative, as this would suggest some kind of

algorithmic representation of learning which is not supported by scientific evidence. Its function is essentially heuristic: by remaining adaptable to the various contexts and types of technology, it should be a tool for teachers, tutors and designers to keep in mind all the interactions at work within complex environments. In the same way, the model is flexible: it does not imply any specific vision of language/culture, technology… It is meant to be reconstructed by each actor in his/her own context. Its function is explanatory and predictive insofar as the structure and nature of the learning environment will trigger the appearance of a series of learner performances without any certainty as to how exactly these will meet pedagogic expectations.

In this paper, we will focus on how the model can help distinguish the specific – and evolving – roles of the various actors of the learning situation. Although different in its initial assumptions, the model will be used in a perspective close to Hubbard & Levy's (2006): "It is assumed that CALL education as a whole should have a wider mission, to prepare not only classroom teachers but also others that are involved in the integration of technology and the language learning process (p. 4). Indeed, we share these authors' view that a useful approach to describing expertise in terms of roles played by the individual within the field, as it is the individual that we are ultimately educating" (p. 4). This paper will therefore consider mainly how the specific roles of the teacher and the tutor emerge by analysing how the didactic ergonomics model can be deconstructed into specialised subsystems.

2.3. Introducing the didactic ergonomics model

As mentioned earlier, the didactic ergonomics CALL model has been fully detailed elsewhere: we will only here sum up its main structure.

This systemic model (fig. 1) is structured around a central process (language learning), conceived as Narcy-Combes's task-based 'learning cycle' (Narcy-Combes (2005, 2010). In a simplified way, this process is defined as an articulation between a macro-task, orienting the learner's activity and interactions with the language, and micro-tasks whose aim is to help solve specific communication problems arising from the macro-task. This perspective combines socio-constructivist (macro-tasks) and cognitivist (micro-tasks) theories of second language learning.

Five essential components (the poles of the model) emerge from the scientific literature of the domain.

- The first three (Language/Culture, Teacher, Learner) correspond to the traditional representations of the learning situation (Houssaye 1988, Legendre 1988, Carré *et al* 1997).

- The specific CALL situation makes it necessary to introduce a fourth pole into the model: the technology pole. As for the former components, the nature of this pole should be made explicit, as such generic terms as 'technology', 'computer' or 'ICT' cover in fact a wide array of realities (computer, generic and specific software, hardware, networks and the Internet, Computer Mediated Communication - CMC) as well as their associated characteristics (multimedia, interactivity,…). This is confirmed by Hubbard & Levy (2006): *when we look through the contents of major international CALL journals (…), we see that CALL is given a broad interpretation that*

reaches well beyond classroom language teaching. The essential questions that should be raised in relation to the technology pole of the model therefore should be:
- what technology are we exactly considering for a specific situation?
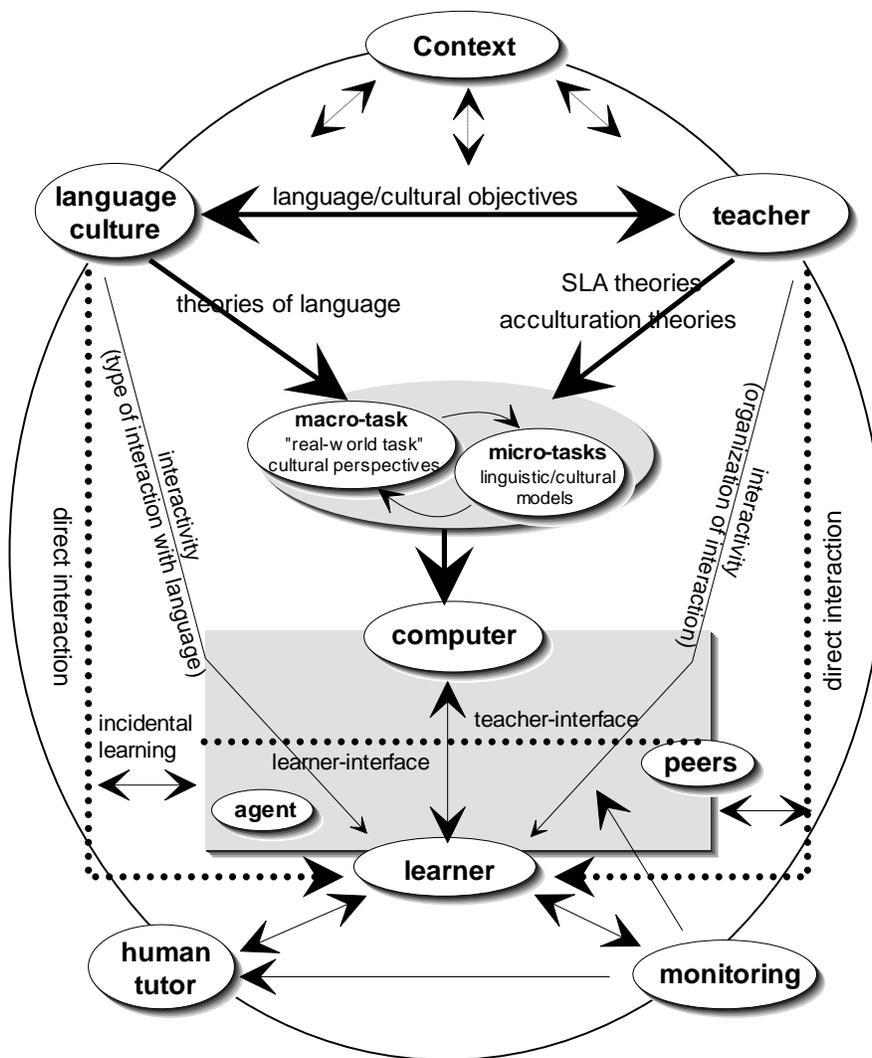- what do we do / what should we do with this technology?

Fig. 1: the didactic ergonomics CALL model

- Finally it has proved necessary to consider that the context constitutes a fifth pole in the model, as all action-research studies point to the fact that the learning situation is always highly contextualized. Definition of the context again raises numerous questions: it might be identified by reference to a micro-level (i.e. the actual learning situation and learning environment), a

meso-level (i.e. the institution for which the learning environment is designed), or to a macro-level (i.e. national and European language and education policies).

When referring to teacher's roles, it is important to bear in mind that the context involves both constraints and opportunities on the teacher and is itself liable to change as a result of the teacher's will to initiate pedagogical innovation (the retroactive effect of the system).

- The didactic ergonomics model also points to the fact that interactions are not necessarily limited to the computer-mediated learning space (the 'virtual' environment). Direct interactions also take place between the learner and the language, outside the formal language learning situation: the resulting incidental learning clearly interacts with the more formal learning environment. In the same way, the learner may entertain direct relationships (i.e. not technology-mediated) with the teacher, as they may be both physically present in the multimedia lab or during face-to-face sessions in the case of blended learning for example.

- To reflect real-life situation, the basic five-pole model should be complemented by a number of other components which (partly) reflect the original poles in the virtual (or enriched?) reality of the screen. Hence the importance of learning aids (Bertin 2001; Narcy-Combes 2007), of peers who may communicate even though they might not physically know each other, of the tutor, whose role has yet to be more clearly defined, and of monitoring devices which can help trace learner activity and consequently shape the tutor's activity and feedback. This information may be used by all the actors of the situation to adapt behaviours, activities and tasks so as to regulate the whole system.

Finally, as the teacher and the learner(s) form two clearly different types of users of the learning space (their relative positions to the process are indeed different), two types of interface should ideally be provided, matching each actor's individual roles, needs and levels of technical competence.

What this model contributes to identify is the distinction between 'materials' (tasks, activities…), the computer-mediated 'learning space' and the global 'learning environment', better described by the French term *dispositif*. This concept of environment requires both epistemological and pedagogical coherence:

- Coherence between the institutional context and the cultural and language objectives of the course.
- Coherence between the theoretical stance underpinning every single pole of the model as well as the process itself (how could a behaviourist vision of the teacher's role co-exist with a cognitivist view of learning?). This means that all implicit representations of teachers, designers… and learners have to be made explicit when designing a language learning environment.
- In this sense, the apparently central position of the technology should not be interpreted as a technocentric vision of CALL (whose aim would simply be to integrate technology at all cost) but as a clear indication of its mediating function.

The interest of this model for teacher education lies in the fact that its systemic component can help construct the 'teacher pole' in two different ways:

- The definition of this pole helps clarify the specific position of the teacher in a given context.
- The identification of the network of interactions in which the teacher is involved and the resulting retroactions on his initial status point to the evolutions and adjustments that are made necessary for the whole environment to work efficiently. This retroactive perspective appears when actual practice does not entirely coincide with initial didactic intention.

3. Deconstructing the model

3.1. Focus on mediation.

An individual's knowledge is described as a personal construction mediated by teachers and peers. Distance [and technology] will not affect the individual's construction of knowledge, but make mediation and social interaction more complex (Narcy-Combes in Bertin *et al* 2010, 128). Whatever the form of language teaching, then, what remains constant is a level of mediation which we will call 'pedagogic mediation' (fig. 2).
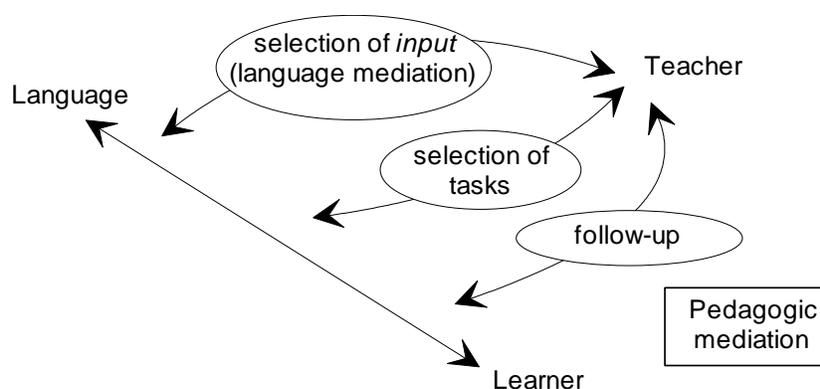

Fig. 2: first level of mediation – 'pedagogic mediation'

This first level of mediation involves a number of roles and their related skills and competences:
- Selection of tasks: macro-tasks especially can most especially be characterized as authentic

(Ellis (2003) 'real-life activities') and as liable to destabilize the learner's cognitive and language representations so as to favour the appearance of a cognitive conflict.

- Selection of input (language mediation): this is related to the choice of metalanguage, of documents and sources to complete the task, the type of language used in direct or CMC…

- Follow-up: this activity is related to monitoring, error/problem diagnosis, type of feedback (in terms of contents, activities, metacognition …).

The competences involved in pedagogic mediation have largely been discussed in the literature (e.g. White 2003, Narcy-Combes 2005, Lamy and Hampel 2007, Hubbard 2009…) and constitute the main body of traditional teacher training syllabi.

Let us simply notice at this point that in CALL situations, the teacher's role may be 'hidden' or 'mediated' by the technology, thus creating a second level of mediation which we call 'technological mediation' (fig. 3).
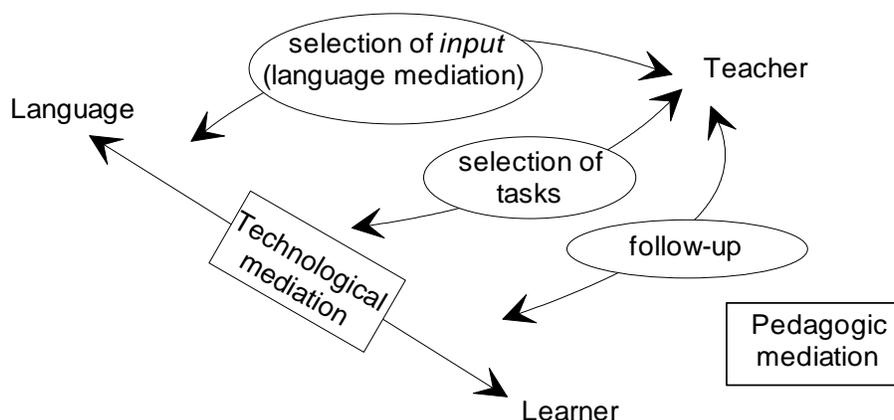

Fig. 3: second level of mediation – 'technological mediation'

Technological mediation corresponds to the instrumentation process and raises a number of questions as to the function assigned to the technology:

Should it be used as a result of external pressure (technocentric perspective, institutional pressure, pre-existence of a learning space or environment such as a platform already in use in the institution …)?

Should it be used as a result of didactic intention (teacher- or institution-driven)?

In all cases, decision-makers, whether teachers and/or management, should devote the necessary time to matching pedagogic objectives with the pedagogic potential of each technology. Indeed, technology can be seen both as filter on pedagogy (it cannot totally replace

man nor former technologies) and as an incentive to pedagogic innovation (the computer can be a source of teacher creativity).

Rick Kern (2010) points to the fact that although 'inanimate', the technology plays an active role in the presentation and negotiation of meaning in the language learning situation. He claims that a process of re-contextualization takes place through the screen (or the camera frame) which limits the scope of the viewer's vision and influences the way he (re)constructs meaning out of the situation he is given to see.

Devising innovative uses of the technology then involves such activities as:

- Reflecting on the type of technology to be used: computer, networks, ready-made or customs-made materials…;

- Reflecting on the modes of teaching: face-to-face situations, distance or blended learning;

- Reflecting on the function of the materials: are they meant to complement traditional courses or are they designed as stand-alone, complete multimedia and/or distance courses?

A third level of mediation ('mediation by distance') appears in the case of distance learning (fig. 4). Indeed, physical distance opens up onto further dimensions such as time distance (synchronous/asynchronous learning), social (isolation) or again psychological distance (loneliness). Each dimension makes it necessary to take into account specific sets of interactions, notably in the case of learner follow-up, opening up onto original forms of tutoring activities.
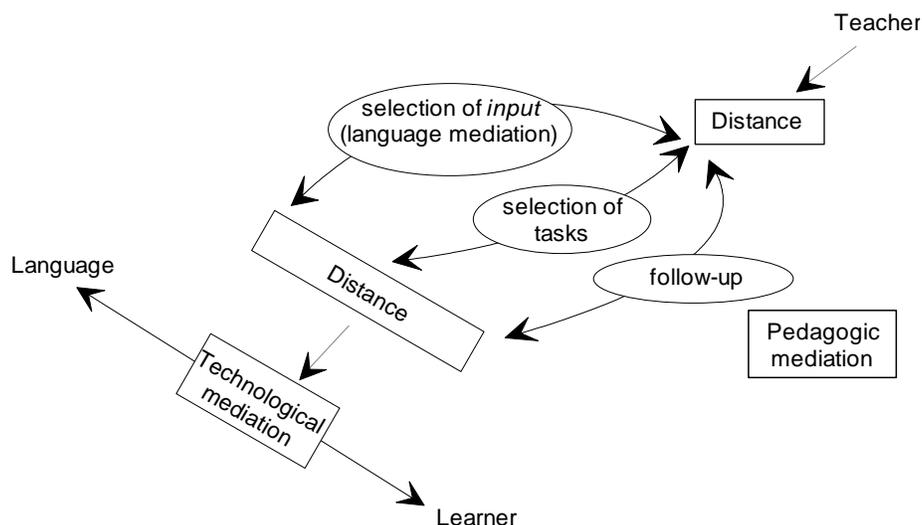

Fig. 4: third level of mediation – 'mediation by distance'

Paradoxically, technology turns out to be one of the means to 're-humanize' distance learning, as is the case with CMC, an alternative to blended learning (a combination of face-to-face and distance situations).

Because of the gaps it introduces into the learning situation, distance turns out to act in much the same way as the 'analyzer' described by Lapassade (1971) and Petit (1991): *… anything that causes truth to emerge of what is hidden; anything may refer to a group, an individual, a situation, an event, a scandal […]"* (Lapassade, 1971, p. 15). Hence it requires the teacher to anticipate on the various situations, problems and questions which may potentially arise and makes it necessary to organize and pre-plan every pedagogical step. To compensate for these different dimensions, the teacher in charge of the learning environment is required to make explicit as many elements in the learning situation as possible that would remain implicit in traditional situations. We will here argue that this need for explicitness constitutes a major source of evolution in the teacher's roles.

We could therefore (re)define the notion of distance by considering it is constituted of *new forms of pedagogic exchanges not only by means of the technology used but also through original* [emerging] *socio-pedagogic configurations* (Dejean-Thricuir, Guichon & Nicolaev V. (2010, 378).

3.2. Deconstructing the model – the teacher-oriented subsystem.

The three dimensions of mediation we have just outlined can help us deconstruct the global didactic ergonomics model into several subsystems, each of which points to the specific roles of the teacher.

The 'teacher-oriented' subsystem (fig. 5) corresponds to the upper part of the global model. The process around which this system revolves corresponds to the organisation of the learning tasks and materials, in relation with the design of pedagogic/technological mediation within the learning space and environment.
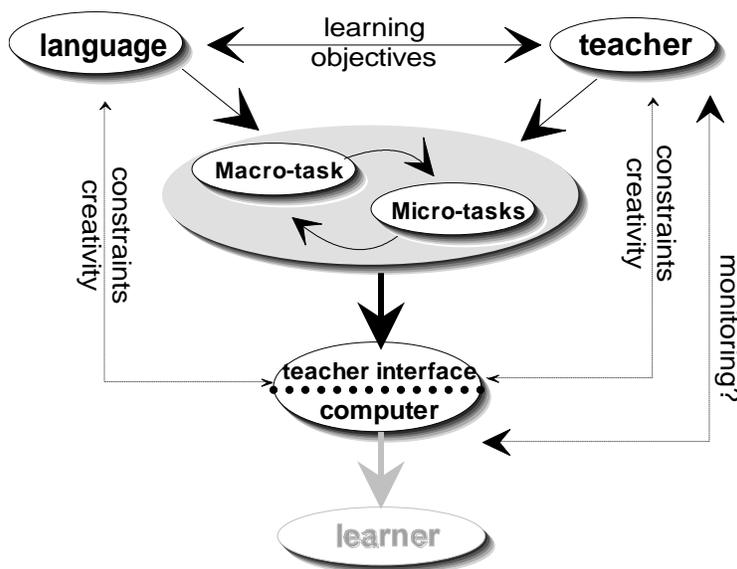
Fig. 5: the teacher-oriented subsystem

The teacher's required competences are defined in relation to his roles as pedagogic mediator but also as course, task, materials and environment designer. Since this requires some capacity to use programming and/or authoring tools, the virtual learning space should ideally include an ergonomic teacher interface (i.e. adapted to his/her level of technical competence and to the pedagogic depth[ii] of the materials to be developed). The issue raised at this design phase is two-fold:

- identifying what the computer can/cannot do;

- opting between merely transferring existing materials to the new technology and thoroughly revisiting activities and documents in order to take into account the pedagogic potential of the computer.

This also means developing a minimum degree of computer literacy to feed the teacher's creativity. Another way of tackling this question, widely discussed in the literature, consists in developing team work, in which case the teacher should also develop competences in team management.

Devising technological mediation also means identifying the type of information on learner activity and progress should be monitored in order to organize feedback and regulate the whole system.

Deconstructing the model – the learner-oriented subsystem.

The second subsystem we can identify is learner-oriented (fig. 6) and includes all interactions

involved in language learning activities. Although centred on the learner, the system calls for a number of teacher competences which depend on how much physical or computer-mediated presence is involved in a specific context. This presence may be mediated or 'hidden' by the computer screen[iii] and felt only through the pre-planned structure and pedagogic sequence of the materials as well as through the choice of activities and tasks (Bertin 2001). A more explicit physical presence may also be possible in the case of blended learning or CMC.
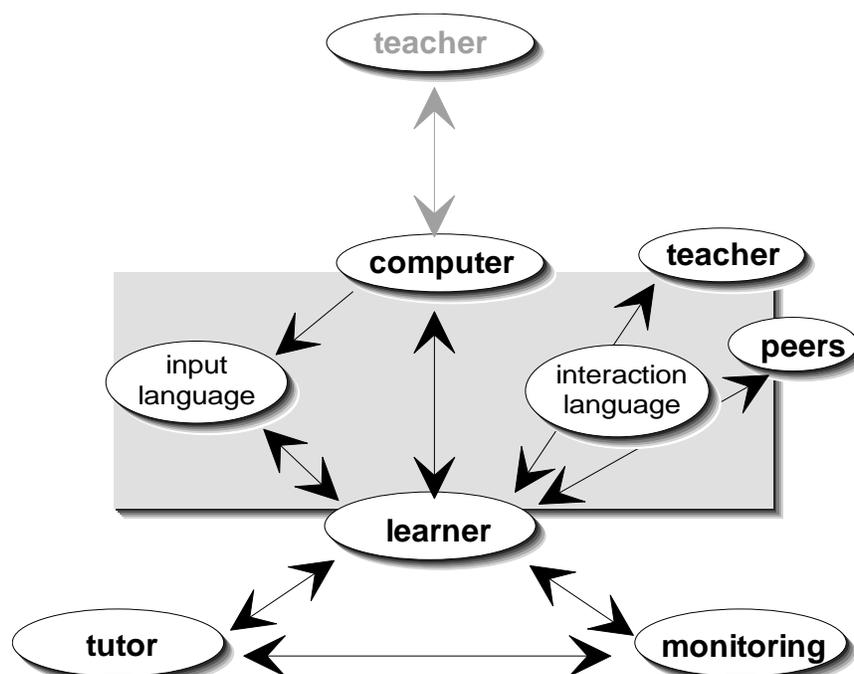

Fig. 6: the learner-oriented subsystem

What makes the distinction between the teacher-centred and the learner-centred subsystems of particular relevance for our purpose here is their disconnection. These systems correspond to two different moments of the pedagogic situation:

Although the teacher-centred subsystem focuses on organization and planning, the actual teaching act is as yet latent, virtual: it is embodied in the materials and in the provision of the tools (traditional and/or technological) forming the inner structure of the global learning environment.

The learner-centred subsystem is only enacted when the learner starts interacting with the materials. This may not necessarily be in a linear relationship with tasks and materials design.

In other words, distance changes traditional roles insofar as the teaching and learning acts are

no longer to be considered in a linear perspective but as different moments and places. This seems to entail three main effects on the identification of teaching roles:

1. Materials design and the related planning of pedagogic and technological mediation implies a capacity to infer on (potential) pedagogic situations, as asynchronicity wipes out any possibility to 'improvise' in front of unplanned situations. This first effect constitutes the illustration of the 'analyser' effect mentioned earlier.
2. The distinction between two distinct moments, two distinct 'acts' (teaching and learning), creates a further distinction between the roles of teacher and tutor, highlighted by their relative positions in the pedagogic situation. On the one hand, the teacher appears to be more concerned with organization, design and planning (Guichon, 2011); he/she stands out as the stage director of the pedagogic play who intervenes before, during (behind the stage) and after the actual learning time. On the other hand, the tutor appears only when the learning process is taking place. We will examine this initial distinction in more details in the following pages.
3. The non-linear relationship between the teaching moment (intention-driven) and actual learning time ('practice') proves to generate potential gaps between didactic intention and users' practices and creates a need for information and regulation.

Deconstructing the model – the regulation subsystem.
While the first two subsystems have been shown to reflect different acts and moments, they also reflect two different perspectives.
- The teacher's perspective is pedagogy-driven and may also include reference to theory if a research or experimental dimension is present in the design of the learning environment. It is influenced (if not determined) by the teacher's personal representations of the technology, which varies largely in the community according to the degree of technical competence. In an anthropotechnological approach (Rabardel 1995), the teacher's perspective is determined by the reflection on how technology may coincide with didactic intention.
- The learner's perspective determines the way the users individually develop specific uses of the learning environment. Actual practice largely depends on their representations of language learning (influence of former school experience) as well as on their representations of the technology. The latter are determined to a large extent by their personal uses of the computer which are independent of language learning: internet browsing, video games, chats…
As a result of this difference in perspectives, real practice seldom coincides with the teacher/designer's didactic intention (Fischer 2006). For the whole system to be effective, therefore, it would be useful to measure this gap. The information needed to observe how the pedagogic potential of the environment is implemented (or even enriched) in actual use is provided by a monitoring device, which forms the focal point of a regulation subsystem (fig. 7).
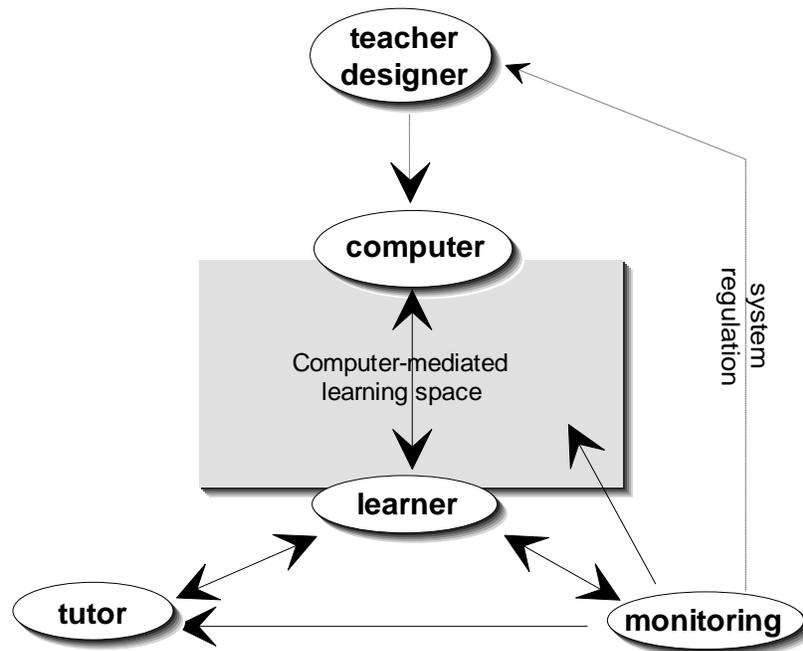
Fig. 7: the regulation subsystem

The degree of elaboration of the monitoring device in turn determines the nature and granularity of the eventual follow-up by the teacher/tutor. It also defines to a large extent the capacity of the whole system to evolve (its dynamic nature).

What is at stake here is two-fold:

- The capacity of the monitoring device to generate information on learner activity. According to specific contexts and modes of teaching/learning, this information will be used by teacher, tutor and/or learner.

- The capacity of the teacher to process this data, i.e. to transform it into usable information for pedagogic mediation purposes. Distance learning and teaching being often related to large groups, this processing activity may be time-consuming and run counter to initial goals. This entails questioning the capacity of the computer to help the teacher/tutor process large quantities of data.

Two main objectives can be set for follow-up:

- At an individual level, tracing learner activity may be used for evaluation purposes or to provide individualised feedback and support to each learner;

- At systemic level, the data may be used to help the teacher/designer spot emerging discontinuities in the environment and modify it accordingly (the regulation function).

Identifying roles: teacher and tutor

Deconstructing the didactic ergonomics CALL model has led us to point to the need to better identify the respective roles of teacher and tutor (see introduction). The stance taken in this article, as stated earlier, consists in identifying each of them through a) their position in the system the global learning environment and b) the roles implied by this position, independently from the physical person who performs these roles in a given context.

<u>The teacher</u>

The teacher occupies a central position in the first (teacher-oriented) and third (regulation) subsystems. The related roles and competences are defined in relation to four levels of activity: course design, task design, materials design, learning environment design and management. Tutoring skills are also required as distance learning seems to evolve into blended learning combining distance (including CMC) and face-to-face situations.

This reinforces Lamy and Hampel's claim that the actors in a CALL environment are required to develop 'new literacies': *this notion of literacy has served to conceptualize this understanding (by the users) of the tools in their environment* (Lamy & Hampel 2007, 43).

Lamy & Hampel refer to these new literacies ('multiliteracies') as the *understanding and competent control of representational forms that are becoming increasingly significant in the overall communications environment, such as visual images and their relationship to the written word* (New London Group 1996, 60, cited by Lamy & Hampel 2007, 43). This definition which focuses on the relationship between forms and meaning overlaps with Kern's (2010) semiotic approach to the technology mentioned earlier.

More generally, these new literacies can be identified as the area of competence defined by the interactions (the mediation) between the different components of the model. They revisit basic teacher's knowledge (pedagogic mediation) with the new perspectives raised by the nature and potential of the technology as well with the need to identify the gaps between didactic intention and actual practice, what Lamy and Hampel (2007) call the influence of the 'how' (means/medium) on the 'what' (product, event, outcome) .

These new literacies therefore include the necessity for the teacher to take stock not only of the tasks/materials and the technology, but also of all the participants in the teaching/learning environment, i.e. learners, peers, teacher and tutor, as well as all other actors involved in

specific contexts (administrators, managers, technicians…). While the teacher should be able to manage the four above-mentioned levels of design, he/she should also play an active part in initiating change in the context itself. This entails (self) analysis and distanciation skills in order to preserve the dynamic nature of the system (evolution and regulation).

The tutor

The tutor appears in the learner centred and the regulation subsystems. His role is clearly connected with pedagogic mediation and is limited to the 'learning act'. Bertin & Narcy-Combes (2007) have defined tutoring as a compound activity including providing pedagogic help, advising on learning aids, processing follow-up data to provide feedback and scaffolding.

Specific skills for online tutors have been listed by a variety of authors, most recently by White (2003) and Lamy & Hampel (2007). A tentative typology would include:

- technical skills (providing assistance on the environment);
- guidance skills (choice of materials and organization of learning, metacognitive support);
- social skills (group animation, support);
- disciplinary competence (for acceptance and recognition by the learners);
- adaptability (to different situations and learners…).

Being more specific about the identification of these skills is somehow difficult. Indeed we can only infer on them by identifying the various interfaces of interaction between the actors/poles of the model. However, we would need to have a more precise representation of the nature of these interactions and of how learning (a)synchronous learning modes influence them[iv]. Much research is still needed in this direction.

Byram (2011) claims that, when learners are confronted to a task, specific steps emerge in an unpredictable way. This makes the teacher's planning role even more complex. We could therefore suggest that part of the tutor's role will be to:

contribute to raise learner's awareness of these emerging steps and their consequences on learning strategies, and

inform the teacher on these new learning circumstances causing discontinuities within the environment.

As a consequence, the teacher will be in charge of reorganising the system at later stages possibly in collaboration with the tutor, according to contexts, so that discontinuities will be bridged and will not hinder the learning process.

Conclusion: perspectives for teacher training/education

The main line taken in this paper is that CALL/distance learning teacher training should evolve to reflect the emerging roles of the various actors. This article focuses more specifically on two

poles of the model (teacher and tutor) as they appear to have more relevance to the point raised. It would need to be further complemented by taking the 'language' and 'learner' poles into consideration.

What stands out is the increased complexity of the roles involved in CALL situations because of the number of components and interactions, on the one hand, of the time dimension and the related uncertainty inherent to the emergentist perspective, on the other hand. These roles may also be more or less blurred according to contexts and they differ significantly from one situation to another (modes of teaching - face-to-face in multimedia lab, distance or blended learning environments -, human and financial resources available, etc). This variety clearly has an impact on the design of formal teacher training syllabi.

We also noted the need for more insight into the nature of the interactions, which would provide a sound basis for appropriate descriptions of the required skills and competences involved. This is made difficult by the (wide) gap between didactic intention underpinning courses, materials and environments, and actual practices (how learners interact with these elements).

Another question is worth raising: who performs these roles? Are the teacher and the tutor one and the same person or should they be separate physical actors? Hubbard & Levy's (2006) distinction between institutional and functional roles remains relevant at this point. The answer(s) to this question defines the degree of professionalism expected from either. Yet, Annoot (2007) noted that surveys of existing practice point to large discrepancies in this respect according to the contexts. She showed that the tutoring function may either be performed by a peer (priority given to social and psychological considerations), by an adult or by the teacher himself in line with the relative weight given to each role in the various contexts.

The question could also be tackled in a different way: can these roles be shared? Must we consider that one tutor only performs the variety of the roles expected or that several specialised tutors should collaborate within the environment? A further question could be: can technology take up (some of) these roles along with the teacher/tutor ('intelligent' tutors)?

To conclude, let us suggest two main considerations for CALL/distance language learning teacher training syllabus design.

a) The line taken in this article involves a dynamic and flexible perspective of teacher training:

The evolving nature of technology first accounts for this dynamic perspective as the changing forms of computer technology constantly renew the way it questions didactic thinking. It is therefore necessary to keep teachers' representations evolving.

Technological mediation, and especially distance, require teachers to develop flexibility: *managing their multiple roles within online environments and coping with learner demand for*

individualized feedback requires flexibility and may initially go against their posture as a teacher (Lamy & Hampel 2007, 62).

For these reasons, teachers are led to develop evolving representations of themselves as professionals. This reflexive perspective constitutes another dimension of flexibility. Since any learning environment is by nature highly contextualised, there exists no way of offering generalisations that could be applied as such by teachers/practitioners. These must therefore develop a dual capacity:

the capacity to observe discontinuities and to provide appropriate reorganisation;
the capacity to analyse how one situation can be transferred to another (or more precisely, which elements can be transferred and which cannot).

This perspective can best emerge from a vision of the 'teacher as researcher', the research element corresponding to the capacity to analyse one's own practice and make it evolve in relation to the other components of the system. This vision reflects Hubbard & Levy's claim that *the language teacher should be able to identify and to understand the impact of authentic constraints and to be able to work creatively within them (…) We want to identify teachers as having the potential to be much more than consumers, if they are given the opportunity. We want them to be regarded as having the capacity for research and development in CALL and performing functional roles beyond practitioners. For these roles they will need training* (2006, 8-12). For this reason Bertin and Gravé (Bertin *et al 2010, chap.10*) advocate an 'action-research-training programme' as a means to promote this reflexive competence.

b) All these considerations point to the difficulty to identify a clear set of competences on which to build teacher training syllabi. Richards & Nunan define 'training' as a formal and institutionalized process of preparation towards the achievement of pre-specified outcomes and the development of skills for predictable situations (Richard & Nunan 1990). This is clearly not the case in the situation we have outlined.

What is therefore necessary is a more flexible and long-term perspective corresponding to what the same authors call 'teacher education': 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 existing patterns.

In this light, teacher education can indeed combine the basic knowledge traditionally required from language teachers with the capacity to cope in the long run with all the didactic implications of technological evolution. This conception might be the 'missing link' between technological innovation and the more appropriate concept of pedagogical innovation.

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[i] http://www.eurocall-languages.org/sigs/teacher_ed_sig.html
[ii] I call 'pedagogic depth' the degree of elaboration of the resulting materials. This corresponds to the degree to which authoring tools make it possible to take advantage of the specific features of the computer technology for didactic purposes.
[iii] We should never forget that etymologically, the screen remains a device meant to hide something or somebody!
[iv] An example of such research would be Cédric Sarré's doctoral thesis: « Approche collaborative de l'apprentissage de l'anglais de spécialité à distance dans un environnement intégrant les TIC : cas de l'anglais des sciences du vivant ».

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