Situated creation of multimedia activities for distance learners: motivational and cultural issues

Abstract

This paper discusses the design and implementation of a task-oriented collaborative learning (and training) experimental project that was carried out with future language teachers. More specifically, a class of 16 French students enrolled in a Masters of Education course were asked to create multimedia resources for a group of Australian students with no prior knowledge of French. This paper deals only with issues concerning French students’ multimedia creations, not with the second phase of interactions with the Australian target group. The theoretical background is situated and collaborative learning and training: the French students worked in pairs, creating multimedia activities based on their culture for real students in a different location. They communicated with each other during weekly classes and via a groupware tool. A triangulated data method was used incorporating the students’ multimedia outcome, questionnaires and semi-directive interviews. The following issues are discussed: what is the effect of such situated learning settings on motivation, commitment and computer literacy? What image did the French students have of the Australian students and which cultural aspects did they try to convey?

Situated creation of multimedia activities for distance learners

Designing multimedia activities has become quite commonplace in teacher training for language teachers: basic computer literacy as well as an ability to integrate information and communication technology (ICT) in a language curriculum are now required in many professional contexts. The originality of the project which is presented in this paper lies in having real students with no prior knowledge of French as the target for multimedia activities designed by trainee teachers: a group of
sixteen French students in a Master of Education course (French as a Foreign Language) in Besançon were invited to create multimedia resources for a class of nineteen Australian first-year students. Several theoretical assumptions, which will be explained in Part 1, lie behind this experimental project. The analysis concentrates on motivational and intercultural issues.

1. Theoretical and methodological framework

1.1 CSCL and situated learning

Our theoretical framework comes primarily from the Computer Supported Collaborative Learning (CSCL) field of study. Some specialists belonging to this broad field put more emphasis on designing computer systems which structure collaboration (Baker, de Vries & Lund, 1999). Others are more insistent on having to establish a “common ground” or a “joint problem space” (Teasley & Roschelle, 1996) among the members of a small group - often a pair - working on a common task. Finally, others stress the importance of constructing meaning through a collective activity (Stahl, 2003). A common point to all these approaches is well summarized by Koshmann (2002): “CSCL is a field of study centrally concerned with meaning and the practices of meaning-making in the context of joint activity and the ways in which these practices are mediated through designed artifacts.”

Researchers in the field of CSCL applied to languages have studied several types of settings. In this respect Mangenot (2001) distinguishes, firstly, collaboration implying two or more people in front of a computer (Dam, Legenhausen & Wolff, 1990, Abraham & Liou, 1991, Little, 1996), secondly, synchronous discussions on the Internet (Kern, 1995, Swaffar & alii, 1998) and finally, telecollaboration (Warschauer & Kern, 2000, Belz, ed., 2003). The experiment described here uses the third type of context.

The assumptions underlying our experimental project can also be linked to the theories of situated learning. We can roughly define situated learning as a process which occurs in a context reflecting real-life conditions. The emphasis is put on context, “enculturation” into communities of practice,
authentic tasks, and “cognitive apprenticeship” (Brown, Collins & Duguid, 1989). According to the situated paradigm, learning occurs within a particular environment and is therefore reinforced when others on-site are involved and share ideas together as happens in the broader social context (Brown et al., 1989, Collins, Brown & Newman, 1989, Hewitt, Scardamalia & Webb, 1997, Barab & Duffy, 2000, Wenger, 1998). Such an approach “will enable students to see how (expert) strategies fit together with their factual and conceptual knowledge and how they cue off and make use of a variety of resources in the social and physical environment” (Collins et al., 1989: 481). In addition, Hewitt, Scardamalia & Webb (1997) stress that "knowing" is tied to context, distributed across the individual, situational affordances and other people. Similarly, "learning" is not the personal acquisition of knowledge, but is instead understood as participation in an activity system”. So far, the situated paradigm has not been contradicted by the CALL research community. In the field of languages, though, situated learning implies taking into account “the social dimensions of language learning and use” (Belz, 2002).

In this respect, our main assumption was that the Internet could offer future teachers, which our students were, situated training, partly in terms of multimedia design, aimed here at real students, and partly in terms of pedagogical communication. We thought that this would bring about a greater motivation and commitment than an out-of-context multimedia creation. We also wanted to make the future teachers think more deeply about what they were going to present from their cultural environment.

1.2 Objectives of the experimental project

In order to put into context the phase which will be analysed here, we should briefly present the overall experimental project. This follows the steps of projects such as Tandem (Helmling, 2002) and Cultura (Furstenberg & alii, 2000) where the aim is to connect students from two countries who do not share the same language and culture. The link established between the students is based on the principle of mutual aid. But whilst in the projects we have previously referred to, the
relationship was established on a strict balance between the exchanged products, i.e. access to a language or a foreign culture (Lewis, 2002, Schlang-Redmont, 2002), in the context of this particular project, the expected benefit was different depending on the students. The Besançon students, in their fourth university year and on a vocational course, were meant to benefit from the experiment by acquiring professional experience whereas the Australian students, in their first university year and beginners in French, were meant to gain a greater motivation to learn about the language and culture.

1.3 Describing the project settings

The project environment will be briefly described from a pedagogical and technological point of view. The different organisation of the academic year in the two countries led us to schedule two successive one-semester phases.

- Phase 1 (October 2002-January 2003): the Besançon students, working in pairs, created multimedia activities intended for the Australian students. This work constituted the main task for a 24-hour course (part of their Master’s degree of French as a Foreign Language) called “Analysing and integrating multimedia materials”. They knew that the Australians would be first-year students with no prior knowledge of French and that they would be using the textbook *Tempo* (Didier), covering six units in one semester.

- Phase 2 (March-May 2003): the Australians, who had 4 hours of French every week, completed in class the activities created by the French students who acted as tutors. This phase will not be dealt with in this paper.

The creation of multimedia activities (Phase 1) was carried out according to flexible and self-directed principles. The Besançon group met for a compulsory 2-hour face-to-face session every week (12 in total) and for other optional sessions up to four hours a week. They had access to a room with 10 computers each time. The students could also work from home provided they had an Internet connection. The lecturer in charge of this course and a tutor were available for compulsory

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1 We used the learning management system *WebCT*, on which the Australians had other assignments to do.
classes and for distance work; in addition, the tutor was available for optional sessions. Assessment was carried out during the final class by means of a 15 minute presentation - with a video projector of the activities created by each pair.

As for the use of technology, unlike some researchers who have developed their own computer environments designed to structure collaboration, we used existing software: an HTML saving word processor (Word), software for multimedia presentation (PowerPoint), a multimedia exercise generator (Hot Potatoes), and a groupware tool (QuickPlace). Collaboration was carried out at different levels with different tools. Each of the eight pairs of Besançon students collaborated in class by working on the same computer, and some of the pairs also collaborated outside of class using QuickPlace. The groupware tool QuickPlace was chosen because it allowed each pair to work together on their own space and also to have access to the other pairs’ spaces. During the weekly class, a video projector was available to view collectively some of the work which had been produced so far. There was also a communication between the French students and the Australian lecturers taking part into the experiment: the latter also had access to QuickPlace and could comment on the activities that were created.

1.4 Methodological framework

The collected data, mainly qualitative, can be classified into three types, which we shall attempt to cross check. These three types are invoked data, raised data and produced data (Van der Maren, 1996: 82). The invoked data (or field data) are the result of ethnographic observation. They include, in our case, observations of students’ behaviour and their interactions on QuickPlace. The raised data are those collected for research purposes, such as semi-structured interviews (eight 30-min. interviews) and questionnaires (eleven collected questionnaires). Finally, the produced data are derived from the learning context; this is made up of the students’ multimedia output. Cross checking these three types of data is intended to increase the accuracy of our research work as each fact can be examined from three different angles. In the limited framework of this paper, we shall
mainly mention students’ assiduity (type 1 data), extracts from interviews (type 2 data) and multimedia creation (type 3 data).

2. Motivation and commitment linked to situated learning

This part deals with three concepts related to the approach presented above. We will attempt to link situated learning, motivation and commitment and emphasize their interrelation in both personal and interpersonal learning processes. We will focus especially on the following research questions: How did the situated context affect students’ motivation and commitment? What was the effect on computer literacy? From a methodological point of view, we will combine ethnographic observations (invoked data) and extracts from semi-structured interviews and questionnaires (raised data).

2.1 Estimating students’ commitment

We will first attempt to estimate students’ commitment. In our prior experience, teaching a multimedia course for future teachers consisted in having students analyse multimedia material, on CD-Rom and on the Web, and in asking them to create web-based learning activities; the expected commitment outside the 24 hour compulsory sessions generally comprised between 15 and 20 hours of personal work.

From the third week of the experimental project, we observed an unexpected and unusual enthusiasm for the creation of multimedia activities. This enthusiasm had two consequences: a) an increase in personal commitment outside the compulsory sessions, b) a request for greater tutorial assistance (see section 2.2). In our attempt to estimate students’ commitment accurately, we will take these two parameters into account.

Cross checking the semi-structured interview extracts with answers to the questionnaires shows a strong commitment outside the compulsory sessions: the average student commitment outside the university sessions reached four hours weekly (i.e. 50 hours in the semester). This work took place
at the computer lab (without tutoring), and/or at home and/or during the extra tutoring sessions according to each student’s personal arrangement. A student expresses her feelings about the time she spent on the project:

- Beside the 2 hour weekly session, how much time you think you spent?
- [...] let’s say 4 hours weekly...
- Did it seem too much to you?
- No, at the beginning, it was OK, because we didn’t have too many things to do [for the other courses], but at the end [of the semester], we worked a little bit less maybe, because we had the other courses, but, er, it was necessary to spend so much time, it was interesting...
- So, globally?
- Yes, I wouldn’t say it was too much because I learnt a lot. Yes, also outside the course, when I tried to work by myself, and then searching on the Internet, all that, you waste a lot of time searching the Internet but, globally, yes, this time had to be spent.

2.2 Request for tutorial assistance

The enthusiasm that students showed from the very beginning of the semester was quickly followed by a high request for technical support. In answer to this request, the lecturer and the tutor responsible for the class very soon decided to set up an extra optional tutoring session of 2 hours per week. Because of the flexible and self-directed character of these optional sessions, they ended up with up to 4-hour weekly sessions by the end of the semester. The students’ request for assistance nearly tripled the tutoring schedule: from the 24-hour curricular course, we reached 65 hours at the end of the semester.

We can make assumptions about the reasons for such an unexpected collective request. On the one hand, the course expectations may have been very demanding on the students. Having little computer literacy, most students faced technical problems that called for assistance. On the other
hand, we believe that what certainly made students so demanding of extra help was their high motivation.

2.3 Qualitative analysis of students’ motivation

The design of meaningful multimedia language activities for a real audience clearly situates our project both in the field of CSCL and in the field of situated learning. It is, though, worth analysing more in depth the relation between the situated context and personal motivation, through the qualitative analysis of the semi-structured interviews.

The link between motivation and commitment is well expressed by a student who was asked to compare the project with a previous experience in creating multimedia activities without a target group:

- *The motivation wasn’t the same because we knew there were going to be people who were going to use these exercises. The motivation wasn’t the same, in fact, so I really committed myself to it. It was new because we’ve never had anyone to teach French to.*

The most popular reason for motivation was the presence of the Australian learners and their expectations:

- *For once, we weren’t pretending or imagining an audience that we were going to talk to, for the first time it was concrete stuff.*
- *Yes, it completely changes the whole perspective. We made activities to suit them [the Australian learners] and their profiles. The fact they were real students obviously motivated us a lot.*
- *Oh, creating exercises, that was really interesting and having the chance to make activities one can use on line [...] here, from a computer you make exercises and there are people on the other side of the world who can have a look at them immediately.*

The existence of a real audience was obviously considered as a challenge for the Besançon students. This innovative element was, in our opinion, the basic reason for motivation and commitment.
Another advantage of situated design is obviously the fact that it provides a precise context in which the outcome is contextualized; the Besançon students felt a real responsibility towards the Australian students:

- And also we were very motivated by... the fact that there was an audience who was really there, we knew who the Australians were, students like us, so they could also expect interesting and easy to understand exercises from us.
- I felt more responsible for the end result. It caused me a lot of problems concerning the interest it might arouse in them.
- It was my favourite course and also the one which stressed me the most. That is, I couldn’t sleep at night because of thinking about it [...]. We put into practice what we had learned in theoretical courses, i.e. to adapt the dialogues to the level of the audience [...], to make short but meaningful sentences [...]

Furthermore, the need to conceive interesting activities adapted to the linguistic level of the learners led the Besançon students to reflect deeply about the pedagogical contents:

- If it hadn’t been for the Australians on the other side², I think we would have done things without paying attention to the theme, whereas this time we had to think more.
- I think it’s harder to create activities for a real audience as it is more concrete.
- We knew it wasn’t fake so I think everybody did their very best to create pedagogical activities.
- As we were working, we realized there were things which would perhaps be too hard for our students, we had to modify, reformulate, so that our students would at least try to understand.
- [Did you have a mental picture of the Australians while creating activities?]³

²“At the other end (of the world)”; In French: “à l’autre bout”. This expression occurred in several interviews.

³Interviewer question.
Yes, of course, to try to find objectives, to see if it wasn’t too hard for them, as we know a little English, we had English at school, so we can see where the difficulties lie when they learn French.

We also noticed a close link between our situated approach and computer literacy:

- I found that really cool, I’ve never been so hooked on my computer before, trying hard to use the Hot Potatoes software, trying to find out all that can be done with hypertext links, things like that that I didn’t know before. We worked a lot, and it didn’t seem difficult; it was coming from us, even when we were working on it, we were motivated.

In summary, being aware of the Australian target group profile (age, language level, expectations, etc.) helped French students acquire a concrete view of the expected outcomes. Creating multimedia activities for a well-defined language group was beneficial from a situative perspective: French students were quite engaged in computer-based FLT practices due to the authentic and real-world context provided. But their initial low computer literacy could have led to discouragement. Their high motivation brought students to ask for more technical support and we were able to offer this support (which might not have been the case outside an experimental project). In other words, we observed that the more they became involved, the more demanding they became upon tutoring and support. Finally, the students attained a higher level of computer literacy and also had the feeling the course had been beneficial for their pedagogical training.

Apart from pedagogical issues, the situated nature of the setting also affected cultural aspects of the multimedia creation: What image did the Besançon students have of the Australian students and which cultural aspects did they try to convey?

3. Cultural issues

The whole project set-up was based on Language Learning in Intercultural perspective (Byram & Fleming, 1998). Therefore, we wanted the Besançon students to be fully aware of the cultural
dimension of their pedagogical creations. They were explicitly asked to think about the cultural aspects of their target audience. In this part we will examine on what specific levels the students took into account the cultural criteria linked to the Australian students. The Besançon students’ perceptions of foreign culture (Kramsch, 1993) will be analysed both through raised data (interviews) and produced data (multimedia productions).

### 3.1 Taking the Australian target audience into account

The fact that the learners were Australian was taken into account in different ways by each student.

For one of the interviewed students, nationality was not even an issue:

- *As long as we have an audience...whether they are African or whatever, it would be the same from my point of view.*

Most of them had an unclear perception of what being Australian involved:

- *As for Australia, I didn’t know much*[^4] *about the country, its culture and what went on there, I didn’t really know they were all so well equipped (in information technology), I knew where it was and that they were pretty far away...*

Interestingly, in France the students tended to define the other students in relation to their own situation. For example, an African student, who was already a teacher in Malawi, focused on the young age of the Australians:

- *We knew they were teenagers, we knew their level of French and that in principle they were English-speaking students.*

While a younger French student didn’t see any difference between the Australians’ situation and his own:

- *These students were a lot like us; Australians are very Anglo-Saxon, there’s not much difference between the two of us. Unlike Asian countries, Australia has a very Western culture.*

[^4]: Emphasized by us.
Only one of the students from Besançon had a reasonable idea of what Australian culture consisted of, having been to Australia the previous year:

- I really enjoyed it, because I was in Australia last summer and having got to know the Australians a bit and knowing they [the students] were about the same age as us, this really motivated me because they mostly learn Asian languages there, and being really interested in their language and culture, I thought why not them?

On the whole, the students in France knew little about Australia. This can be seen clearly in the opinions they expressed, which were extremely generalised and often imprecise or vague. Most of them tried to do some basic research on the Australian way of life but, at that stage, they had only a very simplistic idea of what being Australian meant for their future students:

- I had a bit of a look at a website, at a few documents; I keyed in “Australia” and looked at some photos to get an idea of what it was like. I saw they had hosted the Olympics, looked at a few photos of some scenery, some kangaroos… but it still seemed so far away.

3.2 What aspects of their own culture did they want to show to the Australians?

In deciding which cultural issues they wished to emphasise, the students were influenced by the linguistic and cultural needs of their Australian audience and by their own personalities as well. On the one hand, the French students felt the need to introduce themselves and tell their own story,
and on the other, to show they were interested in the Australians.

Across the activities designed and teaching aids chosen by the Besançon students, there is a constant awareness of their Australian audience and their potential areas of interest:

- Well the theme was intercultural exchange after all! So we were aware, for example, that they had water and boats over there in Sydney too, but that over there they have saltwater and we don’t. So yes, it was important. (...) We had to be conscious of our audience and know what appealed to them, both individually and as a group...

The theme of water was particularly inspiring for the multimedia online activity creators:

- We wanted to show them a bit of our own life so that they could see what it was like. We chose the topic of waterfalls because while they’ve got the ocean we’ve got lakes, waterfalls and Mont St-Michel. We also wanted to show them the Franche-Comté and use it to illustrate what France was like. Not far from where I live there are some really beautiful lakes and waterfalls, and that’s really typical of our region.

In addition to the water themes, which were intended to invoke the interest of the target audience, most likely because of its association with the stereotypical image of the Australian surfer, the French students set out to show the Australians the student culture of Besançon:

- I wanted to show them the youthful, student side to the city of Besançon and that nice small town atmosphere it has, I guess because they were a young audience themselves.
In order to meet this objective, the students used photos they had taken as teaching aids in linguistic activities, which emphasised the places and social events of the student way of life.

Thus, commenting and sharing their opinions on the architecture of the university buildings allowed French students to bond with the Australian students in a way that empowered the subjective quality of the multimedia creations. The possibilities of communication with the Internet clearly distinguish this approach from traditional textbook teaching methods.

3.3 Breaking away from the traditional textbook approach

The desire to portray France and the French language differently from the usual textbook images is explicit in the students’ commentary. The students wanted their multimedia projects to convey a personalised touch rather than the impersonal approach of the classical textbook:

- If you look at most textbooks, there are still all these stereotypes that portray France as a country of luxuries, full of perfume, great gastronomy, it’s true, it’s true, these are all positive points but they still need to come and experience France’s big cities, full of students, great nights out with friends, those little back streets and lanes that you can stroll through and those nice cosy restaurants...that kind of stuff, and it’s not just the splendour of it all, you know. They just need to come and see for real. But I guess we can try and communicate all that as well –not via textbook images, but...through students like us, we’re the ones who need to do it, not those big academics and
intellectuals who just want to convey all these amazing images of France, what we really need to do is show them the way it really is, that's what we've got to do.

In the above comments we can see that while this student is attempting to break away from the stereotypical image of French culture, her discourse retains, nonetheless, elements that would be considered typically French, such as love for good food. This French element remains present despite her replacing the phrase “great gastronomy” with “those nice cosy restaurants”! Thus, the very cultural revolution which she advocates is only skin-deep… Furthermore, the cultural symbol of food also arises in other contexts:

![Fig 4: Presentation of a Besançon baker… by a Malaysian student](image)

This last example clearly demonstrates one characteristic of the French project, that is their nuances of multiculturalism. Here the comment: “French people certainly love their bread…at least in comparison to Malaysians!” is indicative of the author’s Malaysian origins. Let us now explore this multicultural remark in more detail.

3.4 Showing the multicultural dimension of France

It is important that we distinguish two different groups among the Besançon students: those who were native French students, with their desire to convey a non-stereotypical image of the French, and those who were foreign Master’s students, whose different backgrounds were reflected in their work. The first case is illustrated by a student who wished to portray an image of the French different from that found in textbooks.
I've got these photos of some students helping younger pupils with their work, because I work as a tutor, so for example, there you can see that the tutors come from many different ethnic backgrounds. There’s one from the West Indies, actually there are two from the West Indies, there are a couple of Moroccans, a French girl, myself – a Cambodian, and all the school kids, who are Moroccan, Algerian, French, Italian, Spanish, there’s a bit of everything. So you can see that there aren’t just French people in France, but a whole mixture of nationalities all getting on together easily without any problems.

This idea of “ethnic background” or “foreigner” is relatively vague in this student’s mind. For example, while she includes the French West Indians with the other nationalities, her desire to highlight the present cultural diversity in Besançon remains clear.

The second case concerns the impact of the foreign students’ prior experiences and different cultures. This can be seen in an activity where Irmina, a Polish student, uses her personal situation and takes on the dual role of both author and actor in the dialogue set for the readers.

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Another example of how being foreigners affected the multimedia creations occurred when two African students, looking to illustrate a typical French festival, chose Halloween! One of them explained the choice saying:

In the very beginning when we started out, it was around the period of Halloween. We were trying to find something that would interest these teenagers and when we had a look at some websites we saw that these days Halloween is generally a festival for teenagers and children (whereas previously it was obviously quite a frightening
occasion, being all about ghosts and spirits invading the earth and that sort of thing). Nowadays though, it’s not that scary anymore. That’s why we chose it, because we wanted to find something that would interest our target audience and at the same time, something that allowed a certain cultural exchange to take place by looking at the different ways of celebrating Halloween in France and in Australia.

Fig. 6: Halloween in France

In this way we see that the natural association of French Halloween celebrations and the activity undertaken by the university was a significant factor here. An equally important factor was these students’ lack of awareness of the festival’s true origins. While they had participated in the celebration of a relatively new festival whose significance has only arisen in the past 5 or 6 years in France, they were wholly unaware of its novelty and “foreign” origins in comparison to more traditional French festivals. But how can you tell whether a festival is considered typical or not? For a native Malawian, all French festivals, traditional or not, probably retain a certain degree of strangeness.

Furthermore, from a pedagogical point of view it is interesting to note that the students had also chosen Halloween in order to maintain a certain degree of proximity with Australian culture:
Being a group of two Africans, the Halloween theme was a bit complicated because where I come from we don’t really celebrate it at all. We’ve hardly heard of Halloween, even though it’s well known in France and Australia. It would have been pretty difficult to talk about things that the Australians couldn’t really comprehend. [...] We didn’t want to make them work on a theme that was completely foreign to them. That’s why we didn’t put too much emphasis on our own countries – because they’re so different, whereas if we had been designing activities for students in African countries we could have tried to compare Sudan with Malawi, for example. In that case we could easily have found things common to both countries.

After presenting the way Halloween is celebrated in France, they proposed an intercultural exchange by asking the Australian students to tell about their own traditions: “Comment fêtez-vous Halloween en Australie?” (fig. 6).

The Besançon students’ online multimedia projects bring up-to-date the cultural nuances which are inevitably lost in the more traditional learning medium of the textbook. These nuances were influenced by factors such as the time of year activities were carried out, the opinions students formed about the Tempo textbook, the way they envisioned their Australian audience and finally their own particular backgrounds.

They personalized their creations by choosing themes related to their youth culture and personal experiences so that a friendly bond could be established with the Australian students.

4. Conclusion

We limited our research questions to the first phase of our experimental project, the issues related to the French students’ multimedia creations, well before interactions with the Australian target group took place.

Considering pedagogical implications of having a real target group, we believe that its situated nature led to a higher student involvement. Moreover, having to work with a particular
group of Australian students was important for contextualising activities and adjusting them to the
target group’s conditions and specificities. We may conclude that the students’ attitude during the
whole project corresponded to what Salomon describes as “volitional mindfulness” (1992):
“Quality of processes and of outcomes was consistently correlated with students’ volitional
mindfulness; that is, with their voluntary expenditure of task-related mental effort.[...] This is where
the introduction of computers realizes an important potential: turning learning from a process of
simple assimilation into a process of active construction”.

Concerning cultural aspects, we were able to show that multimedia activities created by the
students in Besançon enhanced certain French cultural aspects that are different from those
proposed in traditional French textbooks. The students were able to project a personal depiction of
France in the year 2003. Wishing to increase the learners’ motivation, there was a clear effort to
take into account the presumed interests of the young Australian students. This effort is likely to
help foreign learners access a multi-faceted view of the French culture.

References
of function of spoken language. In: Dunkel, P. (ed.) Computer-assisted language learning and
In: Lajoie, S.P. and Vivet, M. (eds.) Artificial Intelligence and Education, Open Learning
Environments: New technologies to support learning, exploration and collaboration. Amsterdam:
IOS Press, 139-146.
and S.M.Land. (Eds.), Theoretical foundations of learning environments. Mahwah, NJ: Lawrence


« Le français en (première) ligne » website : http://w3.u-grenoble3.fr/fle-1-ligne/