

Writing and computers in French secondary schools

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Although it is not the only objective of mother tongue teaching in France, learning how to write is considered fundamental. This paper will therefore concentrate on " writing and computers " and leave aside the use of software for improving (or testing) reading or for studying literature.

1. Survey of practices

1.1 How many teachers of French use computers ?

It is very difficult to evaluate how many secondary school teachers of French actually use computers with their students, on a more or less regular basis. One out of five (20%) would probably be a very optimistic guess. There are many reasons for this situation, which will be further analysed in part 2. But let's say, for the moment, that teachers of French are less inclined to use computers than their colleagues : they feel they are humanists who must protect youth from cold and intrusive technique and from the ruling of the free market ; they see a deep contradiction between the rigid digital logic of computers and the noble goals of teaching French : to develop self expression, imagination, criticism.

Nevertheless, the French are very individualistic, and the reluctance of the majority has not impeded a few teachers and educational researchers from thinking and acting in the opposite direction, trying to integrate computers in their pedagogy.

1.2 Evolution seen through some educational publications (1984-1999)

Selection method : only papers dealing practically with the theme (i. e. describing writing activities - in a broad sense - in the classroom) have been selected.

Seven particularly representative publications will be considered : five educational journals (issuing from Institut National de la Recherche Pédagogique and teacher associations), one booklet (Centre Régional de Documentation Pédagogique de Versailles), one book (Centre National de Documentation Pédagogique). All deal with using computers in teaching French as a mother tongue.

Papers have been classified into following categories :

- use of electronic dictionaries and software allowing lexicological analysis
- use of drills or tutorials (in the sense that student's output is evaluated by the machine)
- use of text reconstruction software (which Levy, 1998, calls " non behavioristic tutorials ")
- use of *Logo* or automatic generation software (in order to have students model the language, see Mangenot, 1996)
- use of word processor or other professional software
- use of telematics (in the form of the French Minitel)
- use of the internet

- use of writing environments

	Lexico. Dict.	Tutor	Text recons.	Logo philo.	WP, Publ.	Minitel	HT interne
<i>Rencontres pédagogiques 3</i> Des textes avec ou sans ordinateur. INRP, 1984	7		1				
<i>Le Français aujourd'hui 77</i> Y a-t-il un ordinateur dans la classe ? AFEF, 1987	3	1		3	2		
<i>Lire, écrire et conter</i> (brochure) CRDP Versailles, 1988			2	2	8		
<i>Ecriture, informatique, pédagogies</i> CNDP, 1990			1	3	3	2	
<i>Les Cahiers pédagogiques 311</i> , Ecrire avec l'ordinateur CRAP, 1993	2			1	3	*	
<i>Repères 11</i> Ecriture et traitement de texte INRP, 1995					4		
<i>Enseignement Public et Informatique 77 to 94</i> EPI, 1995-1999							7

* *Les Cahiers pédagogiques 314-315* contain a "dossier" about the pedagogical use of telematics (Minitel), which explains that this theme is absent from Num. 311.

This table shows several tendencies :

- Tutorials and drills seem to be rejected, which is quite logical : the pioneer minority which goes into the computer class isn't in search of a (poor) teacher in the machine.
- Applied lexicology was once popular, but isn't any more. Having students use this kind of software (and not just show them with a datashow) is very demanding .
- To a lesser extent, the same can be said of text generators and *Logo*.
- Since it came into existence, word processing has always been and still is the most common software in the French class.

- Text reconstruction (which can prove very useful) and writing environments are under-represented.

- A tendency towards the use of the internet is appearing. It is facilitated by the French experience of the Minitel, a widespread (because free) precursor of the internet. Minitel has often been used in the French class, at all school levels, as a collaborative writing tool.

1.3 Two important projects

Two important and well documented projects must also be mentioned :

- A four year experimentation of computer use in the French class, using text reconstruction and word processor (one of the scarce " ecological " - or systemic - studies) : Caillot-Gary & Glykos (1993).

- An experimentation led by experts from French Department of Education (Ministère de l'Éducation Nationale, 1992 and 1995) consisted in giving volunteer French teachers a computer, a data-show and some software (concordancers, electronic dictionaries, literature database). These teachers always had the computer at hand in their classroom and used it to analyse literary and ordinary texts, to increase consciousness of how vocabulary is structured, and to display texts written by individual learners in order to improve them collectively.

The drawback of this setting is of course that the learners do not interact personally with the tools and the datas : the pedagogy remains teacher-centered.

1.4 The use of the internet in the French classroom

Since the introduction of the internet in schools (it began - very slowly - in 1995), many projects using this new media have been initiated. They are very often interdisciplinary and involve several schools. Writing is then seen as a tool to achieve a project, not as an ability to develop for itself. This approach is close to the Freinet pedagogy, which still has its followers in France ; there are quite a lot of school newspapers, for example, and some have migrated onto the web.

Two books, a special issue of a journal, and two "dossiers" (available on-line at <http://www.cndp.fr/publi/dossier/dossier.htm>) can be recommended ; they contain a reflexion on this theme and some descriptions of innovative practices : Archambault (1996), Durpaire (1997), CRAP (1998), Direction de l'Ingenierie Educative (1996 & 1998).

There is also official Quebec-France collaboration in this field (see : <http://www.meq.gouv.qc.ca/fr-qc> and particularly the competition "Histoires croisées", <http://concours.educationquebec.qc.ca/>).

1.5 Classification of some representative French writing software which are used in secondary schools

	Standard	Tutor	Text reconstruction	Text generator	Writing environment
<i>Conte</i>	Thomson			*	
Paris : Profil, 1987, 1996	IBM-PC*				

<i>Roman, Générateur Roman</i> CNDP 1987, Nathan, 1988	Thomson IBM-PC			*	*
<i>Suites</i> Paris : CNDP 1987, 1989	Thomson IBM-PC			*	
<i>Narrativement vôtre</i> Paris : CNDP/Belin, 1988	Thomson	*		*	
<i>Écritures automatiques</i> Paris, JériKo, 1988	Thomson IBM-PC			*	
<i>J'ai vécu au XVIIIe siècle</i> CNDP/Belin, 1991	IBM-PC	*			*
<i>Cryptext</i> Shareware, 1992	IBM-PC		*		
<i>Gammes d'écriture</i> CNDP, 1997	Windows	*	*	*	*

* shows that there is a Windows version as well.

This table shows a predominance of text generators which is somehow misleading. In general, educational writing software play only a small role in the French class (for those which do use computers) : reading drills, on the one side, word processors and even hypertexts on the other are much more commonly used.

2. Developing writing skills in the French class through ITC use : obstacles and opportunities

I will quickly mention institutional and sociological obstacles, which are more or less the same as for other subjects, and then concentrate on pedagogical obstacles. Finally, I will deal with the support brought by writing environments.

2.1 Institutional and sociological obstacles

Access to computers

Computers may be used following different settings :

* computer classes, which are to be booked and are not always easily available

* documentation centers (CDI = centre de documentation et d'information) which exist in all secondary schools and often possess 2 or 3 computers

* 1 to 3 computers in the regular classroom, in a few experimental schools

* a computer in the class, with a datashow.

Teachers wanting to integrate the use of computers into their teaching would need a more flexible access to the computer class (see Bracewell & alii, 1998) : in the best case, they are able to go there once a week (with a class), always at the same time.

Familiarity with computers, reliability

It has already been said that French teachers are among the most reluctant to use computers. Besides this negative attitude, one must admit that technology is not yet stabilized and that there always is a risk of something going wrong.

Only when a teacher uses a computer (and the internet) at home, for his (her) own purposes, will he (she) be at ease to use it with students. Only 25% of the French population have a computer at home. This percentage might be a little higher among French teachers, but it certainly doesn't exceed 40-50%. Nevertheless, it can be hoped that computers will become more commonplace - and more reliable - in the next few years.

Innovative work not recognized

Teacher assessment doesn't take innovative practices into account. It is very difficult to obtain a few hours off in order to lead a project. It must be emphasized that teachers of French are already among the busiest, because they must assess a lot of written work.

2.2 Pedagogical obstacles

General pedagogy

The secondary school curriculum is still dominated by lectures, texts, and passive learning. Teachers are not often ready to change role, to become organizers and animators of learning activities instead of being the unique source of knowledge.

Integrating work with computers into the curriculum

Writing is probably the best activity one can use computers for in the class of French. But it is not usual to write during the class, written assignments being mainly done at home. So, it needs a certain " cultural " evolution for most teachers of French to go and spend some of their teaching time in a computer class and have students compose texts. A second problem is that closed software don't help much with acquiring writing skills and that open software leave teachers with a lot to do : they must imagine tasks, help students during the activity, assess the texts. Planning tasks is not easy for one who is not yet fully at ease with the software. It is even more difficult to integrate these tasks into the curriculum, i. e. to plan alternately classes using computers, classes with paper and pen and discussions, all fulfilling some learning objectives.

Pedagogy of written composition

- Declarative *versus* procedural knowledge

Very few teachers manage to link formal knowledge, like grammar and vocabulary, with the practical knowledge needed in order to become a fair writer. The link between reading and writing is also often neglected. This tendency is encouraged by the separation between educational software like grammar drills or reading software, and professional software like word processors that do not include any writing aids.

- Common tasks and type of communication in the class

The most usual activity in a French class consists in reading texts and discussing them. The teacher nearly always leads the discussion. Very little attention is paid to peer interaction, and collaborative software, such as the *Daedalus Integrated Writing Environment*, are non-existent in France.

Conclusion : there are so many and so strong obstacles that few changes are to be expected without outside intervention. The typically technocentrist idea that introducing computers into schools might be enough to change pedagogy is considered as illusory by all educational researchers. I see only two ways of bringing about a change : teacher training and action research. The first works if it is not technocentered, if it proceeds from pedagogical needs and explores the assistance machines can bring to existing practices. Another possible way is action research, with university involvement : part 3 examines this option.

2.3 Computerized writing aids: three ways they may help and a condition

Procedural Facilitation

As a way of reducing cognitive overload, Scardamalia and Bereiter (1986) suggested asking learners to undertake just one or two of the many tasks composition involves. For example, they might be given content and asked to organize it, or be given a structure and asked to add content. A computer is ideally suited to this process, for example using text reconstruction programs.

Exteriorizing the Cognitive Process

According to Sharples and Pemberton, computers can be of great assistance in exteriorizing the cognitive process, allowing the writer to see relationships among elements more clearly and to develop and revise structures.

Prompting

Noting the enormous difficulty composition represents for the learner (cognitive overload), Daiute (1985) recommends the use of "computer prompting". Especially for the prewriting phase, she sees the interactivity computers can provide as being intermediary between having feedback from a real reader or in a conversation, and the lonely task of the writer.

A condition : integration into the curriculum

Even if there existed a perfect learning tool, taking into account all findings of psychologists and educators about the writing processes, it would be of little use without being integrated into a curriculum, without its appropriation by the teachers and the learners. As a Canadian review about educational ITC use points out :

How the new technology is adopted is related to 1) the users' interest in doing what they do well and in a better way, and 2) the users' interest in doing things of a different nature than the ones they are used to do. It is important to emphasize that both uses of technology are relevant to classroom learning. [Bracewell & alii, 1998]

3. An example of action research

3.1 The action research group

At the IUFM (faculty of education) of Lyon, I led a seminar called " Computer and composition " which was then transformed into an action research group of ten people : teacher trainers and teachers from different school levels, all willing to try and integrate computers into the pedagogy of written composition. Our idea was to concentrate on the integration of some open educational software, conceiving learning paths (which we called " pedagogical scenarios "), experimenting them in classes and then publishing them as a help for other teachers. At secondary school level, we have used two pieces of software : *Ecritures automatiques*, a generation software I published 12 years ago, and *Gammes d'écriture*, a writing environment. We shall concentrate on the latter here.

3.2 Brief presentation of *Gammes d'écriture*

Gammes d'écriture is the version for French (which was financed and published by the Centre National de Documentation Pédagogique) of an Italian writing environment called *Scrivere con Word Prof*. The Italian authors, Ferraris, Caviglia, Degl'Innocenti (1990) described their intentions in *the Educational & Training Technology International Journal* :

A writing environment which is primarily a word processor, integrated with a set of educational functions acting inside the word processor and not at its borders, so that students can move freely, while writing, between the typical tools of a word processor and the added educational items.

In brief, the three main educational features of *Gammes d'écriture* are (see Appendices) :

- a " library " of short texts (about 300) presented according to several classifications ;
- a " gym " menu containing text reconstruction and manipulation activities, which the teacher can create very easily using texts from the " library " ;
- writing " assistants " which work as prompting aids (see Daiute, 1985). Each of the many " Assistants " of *Gammes d'écriture* (there are about 100) engages in a kind of dialogue with the student to assist him or her in the production of a text. At the end of the " dialogue ", a text is generated, containing both what the students have written and what the author had foreseen ; it is of course possible to improve this text in the word processor.

According to the Italian authors (ibid.),

Another fundamental choice has been to keep the whole courseware flexible, in order to make it usable for different learning paths, chosen either by the teacher in accordance with their goals, or by the students in accordance with their communicative needs and personal writing strategies [...]

The keywords in this quote are " freely " and " flexible " : what immediately struck me when I discovered *Word Prof* was that it indeed had some of the characteristics of a courseware, it had a tutorial dimension, and yet neither the teacher nor the student could be dragged into unwanted paths or dead ends. The authors also say : " our purpose is not the product in itself but its use ". And indeed, the teachers are free to use whatever feature they want, building learning paths, and the student is never trapped in a rigid set of activities. The following " scenario ", conceived and experimented by two teachers in my group, will demonstrate how important - but also demanding - this freedom is.

3.3 A sample tested " scenario " (learning path)

The following set of activities was experimented in a weak "quatrième" (lower secondary school, students aged 13-14). The teacher, Annie Verdun, had noticed that her students were very poor at writing descriptions, and also didn't like reading them, especially at the beginning of literary novels : " Nothing happens, too many details, it's boring ", they would say. Her goal was therefore to make students conscious that descriptions fulfill an important role in narrations and to bring them to compose more original texts. The whole " scenario " lasted for 10 classes, 5 in the computer class, 5 in the usual classroom.

	Classroom activity	Classroom discussion	Classroom datashow	C
1. Text reconstruction (sorting)				*
2. Discussion about clues		*		
3. Reading and discussing texts	*	*		x
4. Text reconstruction				*
5. Discussion about clues		*		
6. Identifying features in texts				*
7. Composing (paper) 2 h	*			
8. Improving a student's production			*	
9. Composing (computer) 2 h				*
10. Composing & publishing				*

x = might have been done in the computer class if it had been available.

Class 1 : Text sorting

Two different texts, both describing a snake, were mixed : one of them had an encyclopedic scope, the other was taken from a narration (see Appendice 1). The students, in pairs, had to sort them, copy them into the word processor, and print them. As it was the first time they had used *Gammes d'écriture*, the teacher, beside the linguistic goal, wanted them to get used to some of the important functions of the software, such as copy and paste into the word processor. All students managed this task well and in a cooperative way.

Class 2 : discussion about the linguistic characteristics which differentiate the two texts (in the classroom).

The students were able to explain the strategies used to distinguish one text from the other during the last class, and this led them to realise that a general description of an animal is quite different from a narrative which shows a precise snake in a precise situation.

Class 3 : checking acquisitions so far (classroom)

Other texts from the software " library ", all describing animals, some in a documentary way, others in a narrative way, were given to the students who had to classify them and point out their characteristics. This would have been done in the computer class if it had been available (see Appendice 2).

Class 4 : description of a city, text reconstructions

The students had pointed out that novels often begin with a place description. So, they were given a Flaubert text describing Rouen (from *L'éducation sentimentale*), with several gaps they had to guess and fill with the help of the context. They found the task difficult, and had to

develop strategies : word search, search of synonyms (bateau/navire), use of dictionary ; they also discovered that they had to spell accurately, with the right " accents ", otherwise the computer wouldn't " take the word ". The same text was then given to them again, but this time the descriptive organizers were hidden. Finally a third activity consisted in identifying forms, sounds, colours and movements in Flaubert description. The teacher had a feeling of intense student activity and exchange.

Class 5 : discussion about clues (Flaubert text)

Students discussed the clues that helped them reconstruct the Flaubert text and realised how descriptive details can help create a certain atmosphere.

Class 6 : Identifying features in texts

Students were asked to identify comparisons and metaphors in several texts available in *Gammes d'écriture*. An item of the " gym " menu allows building such exercises, which are then self-corrected (see Appendice 3).

Class 7 & 8 : Composing and improving a description (on paper)

Students were asked to write descriptions of their town (in order to send them to their penfriends) or to describe an imaginary city. One of the compositions was then selected and improved collectively with a datashow.

Class 9 & 10 : Composing and publishing a description with a certain atmosphere

A *Gammes d'écriture* " Assistant " consists in guiding students in writing a city description which provokes a feeling of fear. This activity is accompanied by a text of Victor Hugo describing a landscape at dusk (see Appendice 4).

3.4 Conclusion

The most important aspect of the " scenario " which has just been presented is the way in which different educational techniques and technologies have been appropriated and organized by a teacher in order to fulfill precise learning goals. Only a very open and flexible software allows such sophisticated integration. Of course, a word processor could have been used. But a writing environment such as *Gammes d'écriture* has several advantages :

- it provides the teacher with a set of classified texts with which it is extremely easy and fast to prepare activities ;
- it makes students more active, both through the activities and the prompting aids ; the teacher can spend more time with students who need more help ;
- it allows even students who have a " writer's block " to write " literary " texts, providing enough support to avoid frustration and failure.

Gammes d'écriture, which very often proposes the same texts in the " Library ", in reconstruction activities and in composition tasks, encourages the conception of such coherent " scenarios ", but it doesn't automatically provoke it, as the authors refused to impose fixed paths inside the courseware. And this is probably the main limit of this kind of software, as it doesn't provide a ready to use content for the writing class. Only motivated and well trained teachers will succeed in integrating *Gammes d'écriture* to their pedagogical practice, as they

must take three different levels into account simultaneously : the linguistic characteristics of the texts to write, the ways in which learning can be achieved, and the possibilities and limits of the software. My opinion is that action research is a possible structure in which such demanding work can be successfully achieved.

APPENDICES

1. Two different texts about snakes

a) Le plus septentrional des serpents d'Europe. Son habitat embrasse toute l'Europe, l'Asie centrale jusqu'à la mer d'Aral, l'Algérie. En montagne jusqu'à deux mille mètres. Collier blanc jaunâtre ou rougeâtre, souvent suivi d'une tache noire qui est le plus souvent visible en arrière de la tête. Coloration très variable. Vit dans l'eau ou au voisinage des mares et des étangs, mais parfois aussi assez loin de ceux-ci. Se nourrit de grenouilles, crapauds, poissons. Taille entre 1,2 et 1,3 mètres, mais atteint parfois 2 mètres. En automne cherche les fentes de rochers, les trous dans la terre où elle hiverne souvent en grand nombre d'exemplaires. À protéger.

-> Félix, Toman, Hisek, *Guide du promeneur dans la nature*, Hatier.

b) La couleuvre la fixait de ses yeux ronds et fixes, sûre de sa proie qu'elle ne quittait pas. Son collier de couleur claire changeait du jaune pâle à l'orangé sous l'influence de l'émotion violente qui l'emplissait ; son dos et ses flancs verdâtres tranchaient à peine sur la couleur de la flore marécageuse que son ventre d'un noir bleuâtre frôlait en dessous.

La gueule était close encore. La bête semblait immobile, mais insensiblement sa queue appuyée sur les herbes poussait la tête, et la large gueule aux mâchoires libres, s'ouvrant lentement, projetait en avant la fine langue fourchue frétilante.

-> L. Pergaud, *De Goupil à Margot*, Gallimard.

2. A screen of *Gammes d'écriture* "Bibliothèque"

écrit Types de textes

Édition Quitter

ARGUMENTATIF / être humain	▲ Un envol de flamants roses
ARGUMENTATIF / animal	La chatte Péronnelle
ARGUMENTATIF / pays	Les chats
ARGUMENTATIF / objet	Le flamant rose
DESCRIPTIF / être humain	La couleuvre à collier
DESCRIPTIF / animal	Une couleuvre face à sa proie
DESCRIPTIF / pays	
DESCRIPTIF / maison	
DESCRIPTIF / objet	
DIALOGUE / être humain	
DIALOGUE / animal	▼

Les uns nagent, d'autres sont debout sur leurs longues échasses. Ce sont des taches blanches et rouges qui flottent, ou bien des fleurs énormes poussées sur une menue tige pourpre. Ça dirait des plates-bandes de lis carminés, d'où sortent comme d'une corolle, des têtes de fleurs tachées de sang, au bout d'un long cou mince et recourbé. Un seul s'élève d'abord, puis les autres partent. C'est vraiment l'envolée prodigieuse d'un jardin dont toutes les corbeilles, l'une après l'autre, s'élancent au ciel.

-> Guy de Maupassant, "La Vie errante".

3. A Gammes d'écriture activity

Désignez les mots et locutions du texte qui peignent les formes, les couleurs, les mou-
les bruits qui caractérisent la ville.

Description de la ville de Rouen.

Puis, d'un seul coup d'oeil, la ville apparaissait. Descendant tout en amphithéâtre et noyée dans le brouillard, elle s'élargissait au-delà des ponts, confusément.... Ainsi vu d'en haut, le paysage tout entier avait l'air immobile comme une peinture ; les navires à l'ancre se tassaient dans un coin : le fleuve arrondissait sa courbe au pied des collines vertes, et les îles, de forme oblongue, semblaient sur l'eau de grands poissons noirs arrêtés. Les cheminées des usines poussaient d'immenses panaches bruns qui s'envolaient par le bout. On entendait le ronflement des fonderies avec le carillon clair des églises qui se dressaient dans la brume. Les arbres des boulevards, sans feuilles, faisaient des broussailles violettes au milieu des maisons, et les toits tout reluisants de pluie miroitaient inégalement, selon la hauteur des quartiers. Parfois, un coup de vent emportait les nuages vers la côte Sainte-Catherine, comme des flots aériens, qui se brisaient en silence contre une falaise.

-> Gustave Flaubert, "Madame Bovary".

Descendant tout en amphithéâtre
noyée dans le brouillard
l'air immobile comme une peinture
arrondissait sa courbe

4. A Gammes d'écriture "Assistant"

Quelques points de repère

Narration

Description

Argumentation

Dialogue

Jeux poétiques

Portrait d'une fillette

Portrait inversé

Portrait-robot

Deux hommes en contraste

Paysage inquiétant

Paysage de sensations

Chambre à aménager

"Pub" descriptive

Campagne publicitaire

Le ciel est noir, ou plutôt il n'y a pas de ciel, il semble qu'on aille éperdument à travers un gouffre. Par intervalles, de farouches tignasses d'ormeau apparaissent brusquement et s'évanouissent. Les buissons prennent des airs accroupis et hostiles. Les tas de pierres ont des tournures de cadavres gisants. Les arbres de la plaine ne sont plus des arbres, ce sont des géants hideux qu'on croit voir s'avancer lentement. Tout vieux mur ressemble à une énorme mâchoire édentée.

Extraits du "Rhin", de Victor Hugo

En reprenant les mêmes constructions l'auteur, vous allez rédiger phrase par phrase une description qui donnera une impression inquiétante au paysage de choix, par exemple un paysage urbain pleine nuit.

Suite

Retour

écrivain Assistants : Rédiger

Édition Quitter

Quelques points de repère Narration Description Argumentation Dialogue Jeux poétiques	Portrait d'une fillette Portrait inversé Portrait-robot Deux hommes en contraste Paysage inquiétant Paysage de sensations Chambre à aménager "Pub" descriptive Campagne publicitaire
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Le ciel est noir, ou plutôt il n'y a pas de ciel, il semble qu'on aille éperdument à travers un gouffre. Par intervalles, de farouches tignasses d'ormeau apparaissent brusquement et s'évanouissent. Les buissons prennent des airs accroupis et hostiles. Les tas de pierres ont des tournures de cadavres gisants. Les arbres de la plaine ne sont plus des arbres, ce sont des géants hideux qu'on croit voir s'avancer lentement. Tout vieux mur ressemble à une énorme mâchoire édentée.

Extraits du "Rhin", de Victor Hugo

Les buissons PRENNENT DES AIRS accroupis et hostiles.

Cliquez sur Suggestion et rédigez un texte en utilisant les mots de Hugo.

*** prennent des airs ***¶

Suite

Retour

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Internet links

- Official Quebec-France collaboration : <http://www.meq.gouv.qc.ca/fr-qc> (competition " Histoires croisées " : <http://concours.educationquebec.qc.ca/>).

- Centre national de documentation pédagogique : <http://www.cndp.fr> (dossiers de l'ingénierie éducative : <http://www.cndp.fr/publi/dossier/>).

- Enseignement Public et Informatique : <http://www.epi.asso.fr>

- Presentation of *Les aides logicielles à l'écriture* (Mangenot, 1996) : <http://www.cndp.fr/publi/collecie/analyses2.htm>

- Presentation of *Gammes d'écriture* : <http://www.cndp.fr/lettres/gamecrit/gamsomw.htm>

- Home Page of François Mangenot (with further links, bibliographies, software for downloading, ecc.) : <http://www.multimania.com/mangenot>