

## **Current Textbook Research in France: an Overview**

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***Abstract:** taking into account last innovations in the French educational system concerning textbooks and educational resources, this text provides an overview of current research streams in France in the textbook field. It discusses the specific context in France and the implications of this context towards research and textbook situation. After discussing some projects, Emmanuelle databank, and methodological guide for Unesco, etc., we focus upon two main issues: design and use of digital textbooks, design, share and use of open educational resources by communities of teachers.*

### **Introduction**

If textbook research cannot be considered as a very active field in France, at least for the moment, 2010 and 2011 can be viewed as important years concerning textbooks. A report from national inspectors of education has recently been published (July 2010) and a national experiment about digital textbooks use is currently in place (grades 6 and 7). First results have been published during autumn 2010 on the Ministry website. Furthermore, publishers and researchers in education are associated in research and development proposals to prepare educational uses and services for tomorrow, in the framework of the digital economy. These initiatives show that the overall context is rapidly evolving pushing actors and stakeholders of textbook market to change.

Actually, on the one hand, there is not in France a community of researchers in the textbook field. The only one was a small team leaded by Alain Choppin (History of education service, national institute of pedagogical research). Since his death, it is difficult to maintain a lively stream of research only devoted to textbook, notably to maintain and extend the Emmanuelle database he launched many years ago.

But on the other hand, many research actions involve textbooks with very different perspectives and it seems useful to give some overview of these research initiatives. I will try to quote different kinds of research in order to give idea of possible connections with Korean textbook research and studies.

In order to present main research streams in France concerning textbooks, it is important to elaborate on the French textbook context, which appears to be specific. So we will begin by giving a rough description of the French textbook context and its implication concerning textbook research. Then, we will give examples of current research, including the seminal work of Alain Choppin and the database Emmanuelle, questions of social representation and discrimination. We will end with the two main research streams concerning digital textbooks and design, use and share of educational resource by communities of teachers.

### **Textbooks in France: an old story with new issues**

*“First nation to have put in charge its teachers of the freedom to choose their tools, France is still today one of the few countries in the world in the field of instructional book, where exists*

*a triple freedom: freedom of production, freedom of choice, freedom of use. This original situation, [...] is the result of a long and complex evolution” (Choppin, 2005).*

School programs are national and designed by the French Ministry of education. Private publishers rely on authors (mostly teachers) and design, publish and distribute books. The French State has no control over them. There is no official accreditation institution of textbooks and textbooks can only be prohibited when there are against morality, the French Constitution or laws. Finally, teachers are free to choose their textbooks. This role played by teachers' prescription is probably essential in the current situation. As a consequence, the manuals are written for them and have become more a tool for organizing activities in the classroom and outside the classroom, than a book to be read by the students.

In many countries, where exists an adoption process, textbooks can be considered as objects that can be studied independently of their use. We can find very careful analysis of their content, for example text readability with very precise criteria. It is not the case of France and if one can find grids for textbooks analysis, most of them are old and it is more common to find grid for websites analysis. As a consequence, from an educational point of view, the effective use of textbooks by students and by teachers is what needs to be researched. But such “use studies” are difficult to conduct, cannot be limited to the distribution of questionnaires (giving opinions not practices and behaviour) and require time. It is often difficult to make a clear distinction between some reports done by actors themselves or produced in association with publishers and research with more established methods and independence:

Educational publishing is, nearly a century and a half, one of the main sectors of the French publishing business. It has represented since the 1960s around 15% to 20% of the sales of the French publishing and between 50 and 60 million copies are now produced each year (Choppin, 2005). Some researches are devoted to the analysis of this market, with an orientation towards economy and management background. One kind of research is the study of cultural industry which includes educational technology and textbook (see Moeglin, 2005; 2010; Bahuaud, 2005).

An important market, but the model of the paper textbook is discussed and can be viewed as no more adapted to the new context. Five years ago, we have established some findings about this out-of-date model (Bruillard, 2005).

Textbooks face growing and antagonists constraints: a very heterogeneous school audience, disqualifying a single discourse, requiring multiple resources adapted or adaptable to different categories of students; new notions of "knowledge" and culture and its appropriation by students; students "wishing" more illustrated and more playful or interactive books; the intrusion of information and communication technology, especially internet, giving access to multiple resources, more timely and more easily updatable; manual must provide diverse classroom activities for teachers, it can be used at home by students, with the possible parental supervision; it has to offer an abundance of documents and exercises, assuming a new documentary function, but still remaining a reference book, outlining the program's knowledge, flawless in front of the critical look of the different disciplines. Probably an impossible mission: is textbook an outdated model? If the findings seem shared, the manual is always present and the fact to be free in education at different school levels remains a political issue. Regarding what should be done, opinions differ.

But, there is currently a form of "consensus": educational publishers are still looking for an economic model. In the absence of teacher training (both technically and in terms of teaching practices), they operate the choice to "wait". The situation still seems somewhat "settled". Furthermore, the educational reform rhythm seems to accelerate. According to the decree

n° 90-179, 23 January 1990, there must be a period of at least 12 month between the publication of a program and its application in class. It is not really in use, and more and more often, publishers have to produce textbooks in a very short time.

### Textbooks: some general considerations

If you can see the books primarily as learning tools, they perform four basic functions (Choppin 2005a): referential, instrumental, ideological and cultural, documentary.

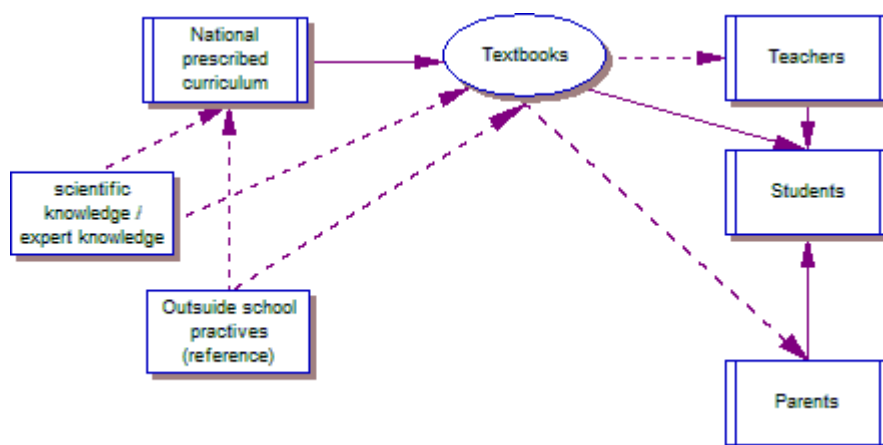
The first function, referential, curricular or programmatic corresponds to the fact that the manual is the main and sometimes the only support of educational content. It's sort of "practical interpretation" of the formal curriculum.

The second function, instrumental, corresponds to the educational use of the manual, the latter exposing methods of learning and offering activities, structuring progressions. In addition, as quoted Choppin (1996), if the manual is an educational tool, inseparable of objectives and teaching methods of his time, it cannot be considered independently of the panoply of tools that are then offered concurrently or alternatively.

The third function is ideological and cultural, more or less marked by periods, countries and disciplines: Textbooks are necessarily vectors of an often implicit value system or preferred modes of reasoning. They participate in the process of socialization and acculturation of younger generations (Choppin, 1996).

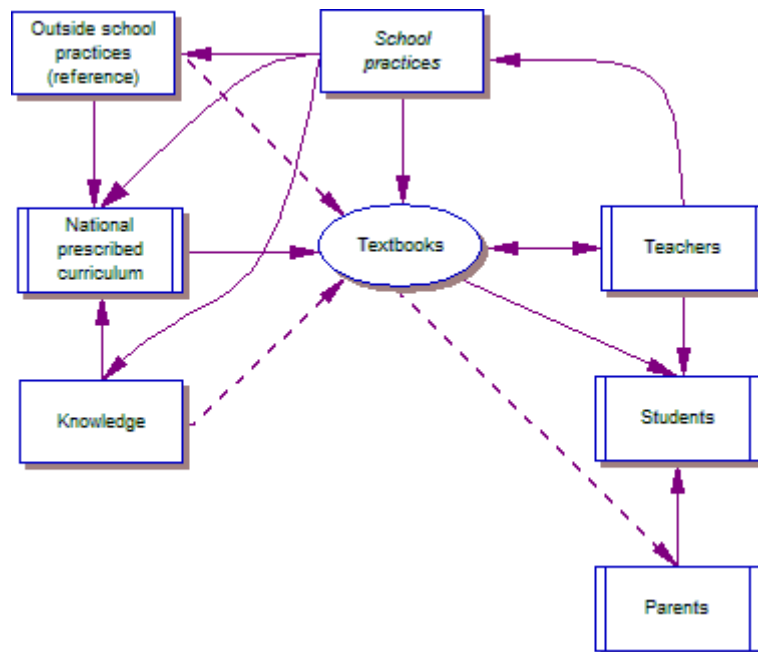
Finally, the fourth function is the documentary one, most recently appeared: the manual is "intended to provide, without orienting the reading, a set of documents, records or iconic, with which compliance or confrontation may develop the critical thinking of the student "(Choppin, 2005a).

In the main approaches of different educational research streams, the manual is a sort of intermediary object, source of information on phenomena related to education that we do not want or that we can not study directly. Seen as a link in the process of didactic transposition, intermediate between the prescribed programs on the one hand, but also knowledge (scholars or experts) and professional practices, and teachers and students (and secondarily parents) on the other hand, the textbook is an object that often leaves aside the constraints, including all the processes of publishing and distribution, to examine the relationships it has with these different poles, covered in a critical or prescriptive view.



**Figure 1.** Textbooks at the core of a process: from national programme (prescribed curriculum) to school practices

Figure 1 shows a simplified representation of the textbook place. The arrows indicate determining relationships; the dotted lines indicate blurred relationships. Prescribed programs determine the content of textbooks and textbooks influence teachers' practices and determine student learning. In this perspective, school program (national curriculum) "tells" what students should learn and what teachers should teach, but through the manuals. It is the imperfection of this intermediate which pays much attention.



**Figure 2.** Impact of school practices in textbook design

But the overall process is certainly more complex. It is not only transforming knowledge in order to make it teachable: can *survive* only knowledge that is sufficiently compatible with the installed classroom practices. If one believes the many works on innovation, showing numerous ascending processes, school culture does not only act as a filter but also as a generator. It would become involved not only in determining mode of delivery, but also in the actual development of content taught.

Figure 2 adds the first proposed model (figure 1) by including school practices themselves and their influence on textbooks. In this context, textbooks are one of the pieces of a complex system. They appear as an analyzer of the functioning of academic disciplines. Textbook issues become disciplinary stakes and then, from the nature of knowledge to pass to the selection and teachable content development.

### **Examples of different kinds of research**

A lot of research are connected to educational research with a specific perspective in a particular subject matter; It is the case in human and social sciences, especially in History, where textbooks is an expression of a current aspect of research. These researches are published in History journals and the intended audience is mainly history researchers.

The last French general scientific book about textbooks (Bruillard, 2005) has included an important place for history and geography (French specificity, secondary teachers in History have also to teach Geography), discussing important issues: roles and statutes of images (and photographs), place of women in History textbooks, etc.

History and Geography are studying very carefully their textbook, the design of the latter are not foreign to their constitution and their development. Furthermore, in these disciplines, political issues, corresponding to the ideological and cultural function of textbooks, arise with great urgency. To teach, according to Le Marec (2005), we must consider knowledge dynamically and prepare students for its emphasis on transformations in polyphonic writing. Concerning painful episodes, it is important that compromises have been made available, that conflicts are calmed; perhaps we need a history textbook designed by teams from several countries to incorporate the views of the other?

Franco-German history textbook appears as a typical example. Its genesis is described in Defrance & Pfeil (2007) and François (2007). According to the ministry of education<sup>1</sup>, eight teachers of history of both countries have jointly written this manual. It complies with both the French programs and programs of the 16 German Länder, based on specifications bilaterally developed by a scientific committee. The first volume of the Franco-German history textbook is available since September 2006 for high school students (Klasse 12/13 Germany). This manual was edited by a pair consisting of a French publisher (Nathan) and a German publisher (Ernst Klett), and has sold over 75,000 copies, in both sides of the Rhine since its release in May 2006.

However, one can legitimately doubt its interest in history classes in both Germany and France. In fact, there is very little feedback on the uses of this manual. An interview (personal communication) with a researcher of Georg Eckert Institute confirms the rarity of use in Germany and shows that, as soon as the release of the Franco-German textbook, some researchers involved in this adventure had doubts about its use in classrooms. In France, the limited evidence obtained through Clionautes<sup>2</sup> confirms the difficulty of use.

## **Stereotypes and construction of gender**

Beyond the teaching of history, the issue of stereotypes and the construction of gender is the subject of numerous studies and research. In particular, with regard to gender representations in textbooks, UNESCO has initiated over twenty years a program of study to eliminate the teaching materials at all levels, based on sex stereotypes. Research and actions are underway.

For several years, Carole Brugeilles and Sylvie Cromer (2002, 2005, 2008, 2009) develop very interesting work on representations of male and female in children's books, particularly because of its methodological choices. Conducted by demographers and sociologists, it complements more qualitative studies of researchers in education.

According to these authors, textbooks have an impact far beyond the immediate confines of school and learning, and are an element of communication within families, especially for values. In that respect, textbooks can become powerful levers of social change in propagating universal values.

They recently have published a guide for UNESCO (Brugeilles & Cromer, 2008 in French, 2009 in English). Based on scientific work and field actions, within the framework of the International Network for Research into Gendered Representations in Textbooks, the aim of the guide is to explore the possibilities of the textbook as a vehicle for gender equality. "There are two objectives in practical terms: to show how gender inequality is constructed in textbooks through the curriculum; to give actors involved the tools to revise textbooks or use existing textbooks critically, whether in the teacher/learner relationship, among individuals

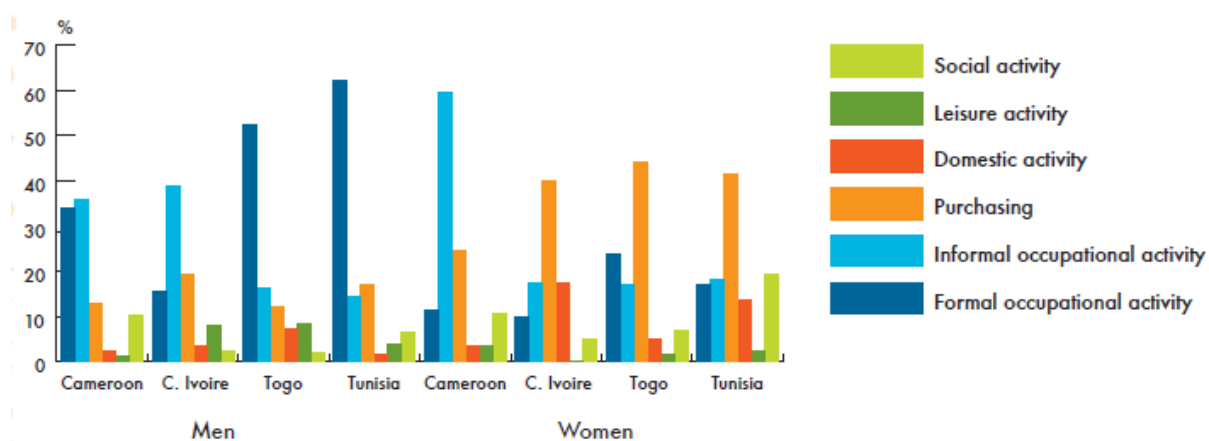
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<sup>1</sup> <http://eduscol.education.fr/D0156/all-manuel-franco-allemand.htm>

<sup>2</sup> French association of history teachers. See <http://www.clionautes.org/>

involved in the textbook chain (from design to use), or outside the school in families and the community”.

This guide provides very practical tools (for example specimens of grids for counting characters and recording characteristics) and results of textbooks analysis in four African countries. For example, concerning adults’ activities in textbooks (figure 3), occupational activities and purchasing are main activities, but distribution varies according to the character’s sex: men in occupational activities and women in the domestic sphere and their most common activity is shopping, except in Cameroon, not an integral part of the public sphere.



**Figure 3.** Adult’s activities in textbooks (Brugeilles & Cromer, 2009, p. 39)

Concerning the place of stereotypes and discrimination in textbooks, a research report (Tisserant & Wagner, 2008) has been conducted on behalf of the High Authority against Discrimination and for Equality. It confirms differential treatment in the textbooks between women and men.

According the summary of this report from the Halde<sup>3</sup>, men are more often represented than women. Of the total of studied illustrations embodying the professional context, 1046 represent men, 341 women. The place of women is still strongly marked in the domestic sphere where their role is reduced to that of mother and wife. They are poorly represented in economic and political spheres.

Persons of foreign origin are often portrayed in demeaning situations. In geography textbooks, for example, chapters on Africa and the Maghreb are too often focusing on poverty with photos of street children, or traditional farmers. These stereotypes are rarely offset by images of modernity, success, development.

Several recommendations are given

- pay attention to language, including a systematic feminization of function names, occupations and social activities;
- making visible girls and boys, women and men in all spheres of social indiscriminately, always for the sake of identity construction; - an active struggle against the untruths and stereotypes through a systematic deconstruction of stereotypes common, conveyed in all social spheres; a rereading of the manuals by a vigilance committee;

<sup>3</sup> <http://www.halde.fr/IMG/pdf/4127.pdf>

- general training of all personnel in the fight against discrimination and stereotyping.

This kind a study raises a general issue: do textbooks have to be "ahead" and show a "desirable" society or rather reflect today's society (or promote a specific model)?

With the methods of discourse analysis, textbooks contents can also be analyzed, and support comparative studies. Patricia von Münchow (2009) has examined different representations of adolescents conveyed by adolescent discourse in French and German first language reading books (12 ninth grade schoolbooks have been studied). “The results of the investigation show that whereas French schoolbooks represent the adolescent as a (future) citizen of an intergenerational well-read community, German reading books convey an image of the adolescent trying to construct him/herself, defining him/herself by his/her age group, in conflict with adults”.

To end this section, we just mention a special issue of the on-line scientific journal “Educations” devoted to textbooks (See Braun, 2010 for a presentation of the content of this issue). In this publication, Loïc Madec (2010) asks, through the choice of a manual of French as a foreign language, the need to take into account the cultural context in which it is used. The case he has analysed is devoted to South Korea.

## Scientific textbooks

Experimental sciences and mathematics and their teaching are not the same relationship to the manual that history and geography. Textbooks are not an object of study, rather a means convened for other purposes. The question is reversed. It is no longer about what research can do to understanding the textbook but to study the role played by textbooks in research. And it is this last question that guides the first one, it provides an analysis of textbooks, but without considering them specifically. Some research into science education adopt a relatively canonical way in the analysis of concepts taught: choosing a concept, then study its history, its presence in the curriculum, its presence and its treatment in textbooks, its presence in tests. It is completed by empirical work on the designs or representations of teachers and / or students. The study of textbooks is one element in this research trail. Many times, textbook analysis can be a sort of substitute for classroom activities observation.

A book devoted to mathematics is worth mentioning: the documentary work of mathematical teachers (Gueudet & Trouche, 2010) focus on the teachers' *documentary work: collecting resources, selecting, transforming, sharing, implementing, revising* them... This documentary work is carried out by teachers in several places, in and out of class, within long-term processes unfolding across a variety of moments. It lies at the heart of the teacher's professional activity; it is both its outcome and driving force.

In order to better understand the constraints in the production of scientific textbooks, Catherine Radtka (2009) has chosen a very interesting methodology. Her question seems very simple. Within a market where textbooks are not controlled by the State before their commercialization, why physical sciences French textbooks appear to be very similar in structure and content, and also very similar to science textbooks used in other countries (for example England)?<sup>4</sup> The reason cannot rely upon a standard imposed by a prescriptive national curriculum, which seems to underestimate the possibility for diversity. Referring to what could be considered as the universality of a “scientific fact” seems even less satisfactory.

According to Radtka, the explanation may rely upon the dynamics of textbook elaboration. Her study is conducted through an observation of the discussions that took place around the

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<sup>4</sup> Several years ago, a study of Le Marec and his colleagues has the same conclusion of similarity concerning history textbooks (grade 9).

construction of an activity concerned with the practical study of water boiling. It demonstrates how an outcome that seems perfectly in line with the dominant, widespread production available in the market actually resulted from a situation in which both authors and publishers shared a wish for change. She has analyzed the dynamics of the process in which heterogeneous constraints and arguments hold by heterogeneous actors resulted in such a situation. It allows revealing how such a process contributes to maintain a standard in the presentation of physical notions.

### **One seminal work of Alain Choppin: the Emmanuelle database**

Alain Choppin, one of the founders of the International Association for Research on Textbooks and Educational Media (IARTEM), was an important pioneer in textbook research. His last research paper “the textbook, a false historical evidence” (Choppin, 2008) was devoted to the question “what is a textbook?” and had the objective of gathering and discussing a number of elements that may help researchers to identify an object of study that has, under a misleading appearance, a real complexity. This kind of scientific work takes place in history researcher’s communities.

It is possible to discover what has brought Alain Choppin visiting his webpages inside the website of the SHE (History of Education Service).<sup>5</sup>

As an historian, he was convinced by the necessity to construct and give access to very well organised corpus, a condition for developing informed research. He was the initiator of the creation of two databases: Emmanuelle, which lists exhaustively the production of French textbooks since 1789, and Emmanuelle 5, which identifies and analyzes the scientific publications of the related field.

The aims of Emmanuelle programme are to put together the complete history of textbook and school publishing in France. The Emmanuelle database compiles, in its entirety, the textbook editions published in France since 1789, for all subjects and all teaching levels. “Each textbook title provides a bibliographical description which includes specific data concerning the subject, the teaching level and the readership, and lists all the editions mentioned in the bibliographies and stored in the major national collections. It makes it possible to carry out simple research (display of an author, a year, or a given level) and more complex research with the combination of several criteria (e.g. English and German textbooks published between the wars by Hachette for the fourth form).”<sup>6</sup>

Up to now, the textbook references of eight subjects (Greek, latin, Italian, Spanish, German, English, History and Geography) have been entered in full. Over 27000 citations corresponding to about 70000 different publications can now be accessed on line on this site.<sup>7</sup>

Since its launch in 1980, the program Emmanuelle inspired many similar initiatives abroad, including through partnership agreements with research institutions. Historical and comparative perspectives it offers also provide an original contribution to current debates, they carry on educational tools or the training of teachers.

Since 1991, an international scientific network has gradually formed a series of agreements on the provision of computer standard developed in service history of education for bibliographic description and the documentary treatment manuals have been signed between NPRI and several foreign institutions wishing to undertake research on the identification of part or all of their production (or collections) of national manuals: University of Ottawa (Ontario, Canada);

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<sup>5</sup> [http://www.inrp.fr/she/pages\\_pro/wchoppin.htm](http://www.inrp.fr/she/pages_pro/wchoppin.htm)

<sup>6</sup> To use it : <http://www.inrp.fr/emma/web/index.php>

<sup>7</sup> See [http://www.inrp.fr/she/wchoppin\\_emma\\_banque.htm](http://www.inrp.fr/she/wchoppin_emma_banque.htm)



University of Crete (Greece); University College of Swansea (Great Britain); University of Groningen (Netherlands); University of São Paulo (State of São Paulo, Brazil); UNED Madrid who Federated twenty universities in Spain, Portugal and several Latin American countries (Manes Research Program); Laval University in Quebec City (Quebec, Canada); Free University of Brussels (Belgium); University of Turin, bringing together several Italian universities, is undertaking a census program of national production.

Some of these projects are now experiencing an important development.

Furthermore, the historical and comparative perspective it offers provides an original contribution to topical debates whether they focus on teaching tools or on teacher training.

Alain Choppin is the author of many scientific articles and had designed a training course for teachers about textbooks (Choppin, 2005b).

## **A movement towards digital textbooks**

As mentioned previously, there is an important shift towards design and school use of digital textbooks: a report from national inspectors (Séré & Bassy, 2010), a survey on the educational ministry website<sup>8</sup>, a national experimentation called digital textbooks through digital working platform<sup>9</sup>, a lot of projects in association between publishers and researchers<sup>10</sup>.

The goal of the report of national inspectors (commissioned by the Minister of education) is to “analyze how to articulate the "new deal" of a global policy of resources for teaching, where the manual has certainly its place, but at the cost of necessary changes in its nature, its form, its status, its relationship with other tools” (Séré & Bassy, 2010, p. 76).

According to the national inspectors, we do not have to use the notion of “crisis” for textbooks: “The manual is not in crisis today, it is part of a profound transformation of the educational tools. So that it operates efficiently and without major troubles, we must redefine a general framework within which the necessary changes and replacements can be made. Such a framework can not only be prescriptive. There must be partnership and involve all stakeholders at all levels from the national political level at the local school. It is on this basis that can be built a policy of teaching resources, both under control in its main lines declined locally and appropriately”.

The report gives a list of recommendations to all stakeholders of the textbook market. One confirmation and one difficulty for publisher: they have to move from product to service, from publishing to pedagogical engineering, searching the added value of digitalisation.

In September 2009, the Ministry of Education launched, in twelve regions, an experimentation called "Digital Textbooks through the Digital working platforms (ENT)" in the following aims:

- reduce the weight of the schoolbag
- propose innovative digital educational resources
- developing the use of ICT in the classroom.

Led by the Ministry, the operation is conducted with the academies and departments, in partnership with publishers of textbooks, textbook distribution platforms and ENT (digital work platform) vendors. During the 2009-2010 school year, this operation involved all the divisions of 65 low secondary schools (grade 6) located in departments that have initiated a

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<sup>8</sup> <http://www.educnet.education.fr/dossier/manuel>

<sup>9</sup> <http://www.educnet.education.fr/contenus/dispositifs/manuel-numerique/expe-manuel-numerique-ent>

<sup>10</sup> A burning issue as these projects have to be submitted before 29th of April!

process of generalization of ENT. This area represents 8000 students and 890 teachers who were able, via the extranet, online access to their digital textbooks from anywhere at any time: in the classroom, resource centre, at home, while having the corresponding paper manuals.

The ministry has published main results of the first year of experiment<sup>11</sup>:

- Digital textbooks designed along the lines of printed manuals, Enrichments providing real value but still too few, interactive features very limited or absent
- A sustained overall frequency of use for teachers / use significantly less frequent for students
- Significant differences between schools / Few marked differences between disciplines
- Different uses following disciplines but little activity with new digital textbooks
- Brake identified on the form and features of digital textbooks
- Suitable for collective use (lectures) but do not encourage individual work
- Room configurations not always suited to reading
- Still insufficient training

According to the ministry, the experimentation is encouraging, with one remaining problem, the fact that teachers give few instructions to work outside the classroom with digital textbooks because of the conditions of access and low added value.

I am currently leading a survey in several secondary schools involved in this national experimentation. Interesting results will soon be obtained.

### **Design, share and use of educational resources by teachers' communities**

Teachers, alone or within groups, produce and exchange educational resources. This phenomenon is not new, but Internet explosion provides both a quantitative extension and a qualitative change. Internet allows collaborative design among distant people and free and immediate access to resources. Furthermore, it is possible to launch collective discussion about educational resources, their use with students and possible improvements after classroom use. We can imagine studying life cycles of educational resources, including initial design and classroom use.

Several teachers associations appear to be very productive. The main French example is Sesamath ([www.sesamath.net](http://www.sesamath.net)), which has designed and produced free mathematical textbooks for low secondary education with great success and appears as a model for other groups of teachers (History, French, economy and management...). According to Sere & Bassy (2010, p. 73), 400.000 copies of Sesamath textbooks have been sold, about 18% of the market of mathematical textbooks (for low secondary schools). In the framework of the *new millennium learner* project, OECD is finishing a report concerning "the textbook of tomorrow: digital learning resources as systemic innovation".

Concerning possible theoretical framework for studying educational resources collective design by teachers, we can mention: communities of practice (Wenger, 1988); horizontal or ascending innovation (Von Hippel, 2005; Cardon, 2006) including some typical examples as the free software movement (Demazière et al., 2008) or free encyclopaedia Wikipedia (Levrel, 2006).

Collectives of teachers can more easily produce and distribute educational resources in a remote collaborative design. These introduce various innovations.

First, if printed manuals are sold at prices lower than those of competitors, textbooks in electronic format are freely available on the Association website (Sesamath case). In addition,

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<sup>11</sup> <http://www.educnet.education.fr/contenus/fichiers/fichiers-manuel-numerique/expe-mn-evaluation-synthese>

extensions, activities are also offered for free and it is possible to offer students activities to do at home, prescribed by the teacher, who can retrieve the results of students, providing a link between classroom activities and activities at home and some control over them. Sesamath production shows how teachers themselves organized in association can lead to loss of traditional boundaries. This does raise questions, particularly around the control or validation of resources by “authorities”.

But, if it is easy for teachers to take and modify an educational resource according their own needs, it might be difficult for them to share the changes they have operated. With a PHD student (Thai Thi Hong Nguyen), we want to design some new functionalities for an exchange platform to ease sharing, indexing and reusing educational resources and to document and monitor the life cycle of educational resources all along from initial design to successive uses in different classrooms by different users. We have investigated opinions of Vietnamese teachers concerning resource sharing and sharing websites (questionnaires N=905, and interviews, N=25). If all teachers seem to have a great need to search information and to download educational resources, they share very rarely such resources among themselves. Why do they share so little though they all declare to be ready to share? Our analysis reveals some barriers for teachers in excellence school (mainly competition between schools and between teachers, possibility to earn more money), and differences between men and women and among disciplines (Nguyen & Bruillard, 2011).

## **Concluding remarks**

The manual is a complex object, ideological support, multi-faceted mirror which reflects the programs, activities in classrooms, but in which the actors project their questions. The move from paper to digital opens up many questions; not so much about the digitization of books, which would facilitate the transition between different reading materials, but about the changes occurring and their impact on education. In what might be debate about the textbooks, several points are worth noting.

The first concerns the tension between two possible models: firstly, the “Meccano” model, a set of largely independent resources or a catalog of resources you can glue together according to all your wishes, and secondly that of the book organized around a thought or an unified vision (Bruillard 2005). This leads to question the structuring and mediation, probably necessary, of the internet for learning.

The second concerns possible changes to patterns of schooling. In France, school support is a field heavily invested by the publishers of digital resources. While some students are unable to use textbooks and understanding the operation requires the intercession of the teacher, the production of such extracurricular assume the functions that the manual was gradually withdrawn. "This reversal of values, the domestic market appropriating the traditional academic content, is not the least paradox of the teaching of mathematics" (Choppin 1996).

Finally, while the instrumentation associated with textbooks and electronic resources grows, how to master this instrument, particularly by teachers? Consumers of resources produced by others, simple local adapters, producers in disciplinary regional or national communities or initiators of deeper changes, what role will they play in a school where computerization in its various forms has taken an important place? Essential question still open.

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