



Educational photocopying in French secondary schools: how does a technology adjust the content being taught to students' reading and writing skills?

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Abstract

Among the documents consulted, adapted and produced by teachers, pedagogical photocopies are particular objects. First, because they are documents most often created by teachers. Then, because they are primarily destined for their students. These documents are part of a complex process that is strongly linked to contextual elements such as curriculum, textbooks, classroom dynamics and school set-up. In the framework of the ReVEA project (www.anr-revea.fr), inspired by Horsley (2012) and Horsley & Walker (2011), a quantitative study on pedagogical photocopying was conducted (Boelaert & Khaneboubi, 2016), in which 46 French upper secondary school teachers were interviewed about how they conceive of and use photocopying for their students. In what part of their teaching strategies are photocopies used? Why is it impossible to avoid using photocopies? How flexible are photocopies in the classroom? What types of documents and documentary techniques are used?

According to the teachers, the content of a photocopy is based on sample textbooks and documents found by using Google search. Analysis of the interviews suggests that photocopies are hand-crafted, tailor-made, modifiable and ephemeral textbooks. The most important criterion that guides the teaching strategy and best explains the importance and nature of photocopies is students' reading and writing skills. Depending on whether students need to practice reading, writing or being 'active', teachers implement a teaching strategy based on the production of a document. When students are good readers/writers, support becomes invisible

and teaching is dedicated only to content. Moreover, these documents are a way of managing the class and the activities of the students.

Keywords: photocopy, teaching, ICT

Introduction

To adopt a different perspective on the most recent technologies it is fruitful to consider older ones. If we look at the technologies in use, we notice that the social impact of the newest technologies is often less important than the oldest one (Edgerton, 1998). This approach, which considers uses rather than innovations, allows a greater focus on mainstream and pervasive technologies rather than fashionable ones. Edgerton (2013) argues in favor of recognizing the importance of so-called ancient techniques for a careful consideration of discourses on "innovation" which are not based on effectiveness. But this analysis shows above all that old and new technologies co-exist, interact and hybridize with each other, like Jack Goody's work on writing technologies (Chevalier & Mayor, 2008).

In 1986, Larry Cuban described how teachers in the United States used the major technologies of the 20th century. The technologies considered (cinema, radio, television, computer) were not very frequently used by teachers due to a lack of technical skills, high maintenance costs for institutions, relative unavailability, and curriculum inadequacy (Cuban, 1986). Teachers hybrid their practices with technologies when they help to solve problems that they consider important and when they do not erode their authority in the classroom. They avoid technologies that increase their workload without benefiting their students or when they weaken their control of the classroom. From this point of view, it is understandable that teachers most often use older, better-proven and more reliable technologies (Cuban, 2001).

To understand the role of computers in a context saturated with computerized technologies, Khaneboubi (2009) describes how the technical and pedagogical actions of teachers in the classroom are two sides of the same coin. Thus, statistically, it was found that teachers who most often used computers in the classroom had significant seniority, and therefore considerable pedagogical and didactic knowledge, whereas the most recently recruited teachers were more familiar with computers but rarely used computers with their students. The teachers using the computers were pedagogically advanced enough to integrate the technical

constraints into the classroom. Other teachers who used computers less reported that technical problems were jeopardizing the course. It was concluded that teachers' pedagogical skills could not be implemented without technical knowledge and vice versa: in practice, in the classroom, these two types of skill were inseparable.

The extension of this idea makes it possible to declare that when technologies are mastered, there is no distinction in teachers' perceptions between the content and its support. When the technologies are incorporated, technical manipulations are experienced as manipulations of contents, notions, etc. If the technologies employed do not stand in the way, the medium is no longer perceived, only content is considered. This perspective echoes, in a more global context, the theses of Jack Goody (1979): the interaction between information and the media that convey it, develops new possibilities of treatment that generate evolutions in cognition.

Work on older technologies helps to develop this question and to understand the practical needs of teachers and the answers they bring to it with technologies other than computerized ones. This is the purpose of this text, which deals with the academic uses of handouts. In what documentary ecosystem are photocopies born? Why is it impossible for teachers to teach without photocopies? In what teaching strategies is the use of photocopies included? This study was conducted as part of the ReVEA project (Bruillard, 2019), which focuses on teachers' work with resources in terms of design, research, selection, modification and re-composition.

Research paths

Today, reprographic techniques are central in French secondary schools. Photocopied documents are used by all teachers in all disciplines and levels. Photocopies are special objects among the documents consulted, manipulated and produced by teachers. First, because they are the documents most often created by teachers, like a patchwork, with their own coherence, coming from multiple sources that make them original. Second, because they are written works that are given to students and produced for this purpose. However, we have found very few studies on photocopies.

In France, as early as 1974, before the implementation of the Haby reform which created a unique lower secondary school known as the "college unique", the reproduction of paper documents had become commonplace. At this time, 250 million copies per year were made in secondary schools. While 43% of

establishments were still using alcohol duplicators, 24% already had photocopiers. At that time, half of the documents reproduced were original documents (subjects and exercises developed by teachers), 31% were official documents and 6% were textbooks (Thouvenin, 1975).

In the context of biology teacher training in Belgium, Poffé et al. (2015) showed that photocopied materials provided to students are designed primarily to help teachers to deliver their lessons rather than to structure and facilitate student learning. Thus, the editorial style, the illustrations presented (drawings, graphics, diagrams), the associated texts and the frequent absence of synthesis, contribute to making it difficult to work independently, regardless of the use made in class. These conclusions partly coincide with the work of Balcou-Debussche (2007) in primary education in France, who noted that photocopies are an organizer of teachers' professional practices. This phenomenon is similar to Choppin's (2005) work concerning the formal evolution of textbooks, whose evolution towards a great modularity provides for partial use and recomposition by teachers.

An Australian study (Horsley, 2012; Horsley & Walker, 2011) on photocopies attempted to characterize the viability of replacing paper-based documents with digital documents in the secondary school context. In 2011, for the first time, Australia introduced a common school curriculum for all schools in the country. To provide educational resources for students and teachers to support implementation of new curricula, one company developed a national directory of online educational resources. In addition, each Australian student between the ages of 9 to 12 was provided with a laptop computer. Horsley (2012) studied the documents photocopied by teachers in surveys conducted by the copyright association. He estimated that only 3% of the photocopies came from the directory's online resources. Textbooks and paper-based materials were the almost unique source of photocopies and thus teaching and learning resources in the classroom. He therefore questioned the viability of a single centralized catalogue as a source of documents for teachers.

For us, one of the contributions of this work is to consider surveys carried out by the copyright collective as a source of quantitative data reflecting teachers' activities. In France, the company responsible for managing reproduction rights, called the "Centre français d'exploitation du droit de copie" (CFC), collects and redistributes royalties from schools, universities, businesses and administrations to publishers. 70% of the money collected for reprography by the CFC comes from schools. To redistribute these funds, the CFC

conducts annual sample surveys on the use of reprography in secondary schools. In collaboration with the ReVEA project, a database produced by the 2011-2012 and 2012-2013 surveys was studied (Boelaert & Khaneboubi, 2016). An analysis of the data revealed extreme inequalities. For example, the eight most photocopied publishers accounted for 70% of photocopies in 2013, whereas in the same year 53% of publishers were represented by only one photocopy act. Furthermore, the bulk of photocopies concern school works. Literature, history-geography and languages produce more acts of photocopies than scientific disciplines.

Method and procedure

Between 2015 and 2016, qualitative work was carried out in four polyvalent secondary schools in the Paris region (referred to as Lycées A, B, C and D below). It was mainly a question of meeting teachers in the reprography departments and in teachers' rooms. Frameworks of interviews on photocopying practices were produced for teachers, managers and reprographic staff responsible for photocopying. It was also necessary to collect contextual information on schools, such as the number of pupils and teachers, special fields of study, and the academic paths of students. In the end, about 47 interviews with teachers were carried out, as well as four interviews with school accountants and four interviews with reprographic staff. From the perspective of school ethnography, observations and interviews were conducted from November 2014 to March 2015, twice a month in schools A and B, half a day in school D and two half-days in school C in 2016. It was difficult to find schools in the Paris area who would agree to host researcher on this subject. With our qualitative approach it was not pertinent to seek representativeness in the sample interviews we conducted.

The analysis of the interviews was based on the grounded theory (Glaser & Strauss, 2010), i.e. on the elements of meaning to construct general themes. The interpretation of the data was done by considering the analysis of our object "not as an experimental science in search of law, but as an interpretative science in search of meaning", from Geertz's theoretical perspective (1998). It was for us to classify what was meant by "[reading] (in the sense of "constructing a reading from") a foreign, defaced manuscript, full of ellipses, inconsistencies, suspicious corrections and biased comments, and written not from standardized graphic conventions, but rather ephemeral models of forms of behavior."

Table 1 (below) presents the general characteristics of the schools. Note the large quantities of copies made. All the schools are located in urban areas, none are classified as poverty areas, but three are marked as

“polyvalent” (with students in general, technical and vocational sections), and only one school prepares students for general and technical baccalaureate courses. The four schools offer technician certificate (“Brevet de Technicien Supérieur” - BTS) diplomas and two have Higher School Preparatory Classes (“Classes Préparatoire aux Grandes Ecoles” - CPGE), which are part of the higher education field located in upper secondary schools.

Upper secondary School	A	B	C	D
Number of teachers	130	110	140	150
Number of students	1,200	1,000	1,100	1,700
Number of copies	100,000 for a busy week	8,000,000 per year	50,000 to 70,000 per week	-
Budget	A quarter of teaching budget	-	80,000 € per year	40,000 € per year excluding paper

Table 1. Profiles of the schools involved in the survey. Values are approximate and based on statements except for school C where they were found on accounting documents

Photocopies have many issues and consequences and are a controversial issue in schools. While teachers were happy to talk about photocopies, they were often reluctant to give the investigator a copy of their documents as we had originally planned. At the institutional level, the subject is highly sensitive and potentially a source of conflict.

The school accountants who we met showed great interest in the issue and were all looking for cost-saving solutions such as quotas, color copy restrictions, systematic double-sided copying incentives or negotiations over lease agreements for machinery. They believed that reprographic work is constantly increasing. They also indicated that higher education teachers do the most photocopying, and literary disciplines more so than scientists. In fact, teachers very often indicated that they did not do an unreasonable number of photocopies, for example by indicating that they “made” black and white instead of color, double-sided or reduced formats.

Results

A sampling of written material

According to what we were told by the teachers we met, the photocopied documents given to the pupils consist primarily of extracts from textbooks other than those chosen by the school for the pupils: that is, free samples, or older or foreign editions in languages, for example. The free copies received by teachers are the primary source of documentation for teachers, after the textbook chosen by their school. This mailing of textbooks to teachers is part of a quantitative survey system implemented by school publishers since the 1970s.

The second source of documents constituting educational handouts remains the Google search engine. Apart from Google image search, no advanced search functions were mentioned, nor any other search engines. Teachers simply state that they search “in Google”. The sites visited are very rarely mentioned. On the other hand, they claim to collect “interesting” and “relevant” documents and thus implicitly indicate that they are evaluating the documents they choose.

Two main elements are mentioned by teachers to explain the importance of photocopies. First, the most frequently cited factor is the absence or flaws of textbooks. Secondly, the relationship to students' writing abilities, which guides the design of a photocopy: photocopies make it possible to adapt what is taught to students' reading and writing levels. We will see how, in the words of the school teachers we met, these two elements explain the significance of pedagogical photocopies in the classroom.

Textbooks, freedom and pedagogical preference

The lack of a textbook is the first factor that teachers put forward to explain their need for photocopies. Where textbooks do exist, they are very often considered inadequate in terms of curricula in general, the progress of the course, or the “level” of their students. Teachers say they follow their own “desires” or tastes. Very often they refer to a personal dimension expressed as a collective trait: “doing something that corresponds to us”, “our progress”, or “working according to our tastes”.

An English teacher explained that, for the teaching of English in industrial technician certificate, she adapted her teaching in the absence of a textbook by looking “on the internet” and “digging around”. It can also be a question of making up for textbooks that the students do not bring: “When they don't have their equipment it is annoying, they work with the [class] neighbor, they talk...” It is also possible that the students

are exempted from bringing the textbook, so a teacher of physics and chemistry photocopies the school textbook. The pupils do not bring it because it is “too heavy”. The teacher therefore always plans photocopies of the school textbook, because he believes that since “the republic pays for it” it is necessary to use it even if it does not always correspond to what he wants to do.

Where the textbook exists but is not used, this may be due to school curricula. Thus, in literature, textbooks are not a privileged source as one literature teacher states: “[...] In French, photocopies are much more often used because one does not follow the textbook as in history or math. [...] We are working by object of study: theater, argumentation, poetry... [...] In literature, as there is an infinite number of texts and we are given a great deal of freedom to work according to our tastes, we make many more photocopies.”

Teachers implicitly refer to the quality of textbooks as well as their freedom and preference, which is a way of emphasizing their expertise and responsibility. For example, a professor of economic and social sciences explained, “as the textbooks are not always satisfactory and I am going to dig up in other textbooks, I need photocopies”. One physical science teacher explained that she was inspired by several textbooks, “to do something that's right for us too, because you can read a course on a textbook and have a vision that's not necessarily the same as the textbook and a way of looking at the course that wasn't that one and with which you won't feel comfortable if you follow the textbook.”

An industrial science and technology teacher clarified this question by taking the case of energy education and considering that the book was presented like a catalogue. He considered it easier to appropriate the content in a specific context. “For example, by presenting the island of Hierro [in the Canary Islands] which uses different sources of energy while in the book they will not necessarily do... it will not be applied to my pedagogy. However, the book can be used for exercises, but not as a course. The textbooks don't necessarily have [the same] course progression.”

In short, the use of photocopies is explained by referring to the absence or inadequacy of the textbook as teaching context but also to tastes, desires and preferences concerning the contents to be taught.

Adjusting to students' writing skills

The criterion that best explains the use and nature of photocopied materials is the relationship of students to reading and writing activities. The teachers we met say that photocopies are a means of adjustment, an interface between the content and students' reading and writing skills. Thus, photocopies are considered particularly essential if students cannot read and write well. A school math and science teacher in the vocational section feels that his students find reading and writing too difficult to be able to teach in any other way:

In science, it is almost impossible to teach without photocopying with these students.

Photocopies are fundamental. It would be different if we were talking about students who can write, but we cannot dictate: they are too slow. Making them read a text is complicated, they get tired quickly.

In a similar logic, but focused on writing rather than reading, a science and technology teacher in industry and sustainable development (STI) emphasizes the difficulties of writing for his students. The documents he gives them are part of a teaching strategy:

In STI, we have students who are having trouble [...]. They come to STI because they couldn't get into [science section]. They're kids who have trouble synthesizing. Giving them a large package of photocopies [is no use at all]. We have to make them write so they can synthesize, then it's cognitive. Let there be a gesture: I hear something and write it on a support.

Other teachers, often from upper education sections in schools, do not perceive it in terms of the relationship to writing. Instead, they consider only the content. For example, a teacher of literature in BTS declared, "I took [these texts] in a textbook that I received. They have an interest in the problem and are likely to please them." One of the texts relates to a man who recounts his recollection of the microscope when he was a child and includes an analysis of the microscope. For her, only the contents are taken into consideration.

Photocopies are therefore a medium for which there is a graduation in how teachers conceive of them: for vocational secondary school students who have difficulty reading complex writings, for technical secondary school students who need to write, and for BTS students for whom the medium is no longer perceived and

whose manipulation is implicitly considered by the teacher to be incorporated. From this question, a teaching strategy is elaborated and is reflected in the nature of the materials given to students: leave a trace, have them read, write, be interested, etc.

The most common strategy is to try to get students to write, using photocopies made for this purpose. For example, one mechanical engineering and engineering science teacher felt that for “upper secondary school students [in relation to BTS] it’s not the same, they have to write, it’s not enough to read. They have to write to learn better. If you give them a photocopy and write on the board, it’s useless, they don’t understand.” This is also the case for a biology and geology teacher we met who avoids giving photocopies: “I like that they also write. In their assignments at the [baccalauréat], they have to write”. He feels that students read fairly well in the final year, but much less in the second year.

Written traces and class time

This consideration of the relationship to students’ writing creates a paradox: if a teacher uses photocopies, students are passive and do not make progress. If he or she does *not* give enough photocopies, the students are more likely to be asked to read and write, but the success of the teaching and learning could be compromised.

For example, a teacher of modern literature at the general upper secondary school considers that providing photocopies makes it possible to compensate for the reading difficulties of her students: “I have children who can no longer read... [With photocopies] at least, one can be sure that they have something”. She strongly suggested that photocopies also constitute proof of her activity. A French teacher in a upper secondary school felt that it wasn't necessarily productive: “If you give them the equivalent of the course, not only do they not take any notes, but they are also passive and wait because they know that in the end I’m going to give them the photocopies”.

In physics-chemistry, several teachers considered that photocopies save time in class and that students don’t waste time copying, i.e. photocopies are a substitute for taking the course: “We replace what they don't take in notes, [because] kids have a hard time taking notes, it's getting long, they have a hard time writing”. The same goes for a mathematics teacher in general sections: “[...] if there is a lot to copy, and I would like to use time in class to explain and then do exercises and not copy. It doesn’t prevent you from copying some courses

too, but not all of them.” In mathematics in particular, this question is related to particular writing such as tables and graphs, or diagrams that can be difficult and slow for students to copy.

Two cases of non-use of photocopies

During this work, we encountered only two situations where it is conceivable not to use photocopies. The first is a life and earth science class, teaching about sustainable development, and the second is for a class where heckling makes ordinary teaching impossible.

In response to a request from her tutor, one biology-geology teacher did not use any material for the topic on ecological issues. “I had to review my whole way of doing things... I put everything on my [slide show]”. The aim was to raise students’ awareness of paper consumption, so the whole teaching of the theme, spread over several sessions, took place without any photocopies. In particular, it was necessary to make more frequent use of the textbook and to project the pages of books containing the documents to be analyzed. In the absence of photocopies, class activities changed: “there was a debate on biofuels”. In the photosynthesis section, she made students work according to the experimental approach by alternating video-projection and students taking notes. If photocopies had been used, the students would have completed a worksheet. In this case, the projectors were a substitute.

A new 10th grade teachers in mathematics was being heckled by her class. When she started teaching, she felt that photocopies were not important. She then encountered many difficulties. Her colleagues advised her to prepare visual supports in paper or projected form and to avoid lectures on the board. The headteacher spoke with her in the presence of the interviewer. After she had told him about the heckling, the headteacher gave her some tips: avoid photocopies, except to evaluate the students:

“You’re showing a video and you say, ‘Copy now!’ [You] have to stop [being kind]. At some point [They] write and then that’s all. They copy what you project, and you monitor them and the first one who squeals on you, bim! They just have to copy what’s on the board, there’s nothing left...”

What was evident in these pieces of advice was that they limited the use of documents.

Discussion

Comparing the use of photocopying with computer technology is interesting, first of all in terms of the resources allocated (budget, dedicated staff, premises, supplies, etc.), which are greater for photocopiers than

for computer technologies. This can be interpreted as the fact that photocopies are essential for students to progress in their learning of academic writing, i.e. to succeed at the baccalaureate level.

Then, the realization of patchworks, i.e. sample writings, is facilitated by the use of word processors and search engines. Photocopied documents are part of a hybrid technological process (including text processing, reprography, handwriting, etc.) that integrates into school technologies (files, notebooks, tables, etc.). The technologies used to design them are based on products supplied by a small number of very large multinationals. The main editing tools are Microsoft Word and school photocopiers (often under contract with Xerox). Word, Google and photocopiers are products whose ergonomics are extremely sophisticated and can give the illusion of simplicity of use that could subject their users to what we might sometimes call "ergonomic captives".

The absence of textbooks or their inadequacies in adapting to teachers' preferences does not really pose a problem for teachers who invoke or suggest that their pedagogical freedom is rightly exercised in terms of their responsibilities and expertise. Moreover, photocopies given to students can be considered as handcrafted, custom-made, modifiable and ephemeral textbooks. Note that the format of the manuals and photocopies are the same: modular documents whose evolution was described by Choppin (2005).

Photocopies are thought to reflect students' reading and writing skills, looking for a balance between learning to write and content work. The design of a handout is therefore adapted to a specific class, the exercises or excerpts of documents reflect a group of students who are categorized according to criteria such as, for example, "fast", or "super slow".

The relationship to students' writing is intimately linked to school times by giving written records to students. The issue of written records left by the teaching is important because it is a way of enabling students to work but can lead to a perverse effect by exempting students from writing. Conversely, writing difficulties are seen as both the cause and consequence of the extensive use of photocopies.

Conclusion and perspectives

Photocopied documents given to students are central to teaching activity. The main sources for the design of handouts are textbooks and Google search results. The stated reasons for such massive use of photocopies are: first, the absence of textbooks for the level taught or their unsuitability to teachers'

preferences; photocopies are also an adaptation of the content taught that are selected to fit the students' reading and writing skills. This criterion determines the teaching strategy and the nature of the photocopies produced. Depending on whether students need to practice reading, writing or being "active", teachers implement a teaching strategy based on the production of a handout. When students are good readers/writers, the medium is no longer mentioned, and the teaching strategy is dedicated to content only.

In order to understand the status and function of these documents in the classroom, it is necessary to consider that the course material, whether paper or not, constitutes the materialization of the teacher's position in the classroom, which is somehow between the pupils and the knowledge to be taught. The constraints induced by this encounter are imposed on teachers who have to use their documents in the classroom by making as few concessions as possible on the rigor and accuracy of the knowledge taught and, if possible, by taking pleasure in sharing knowledge that they consider useful. In short, photocopies are a means of establishing a *modus operandi* between student constraints, daily school organization and the content to be taught. From this perspective, what teachers say about photocopying becomes meaningful.

The importance of photocopies in secondary schools raises fundamental questions about the format of textbooks. Publishers may be considered to provide raw materials in paper format for which they receive a first payment for the purchase of the textbook and a second for photocopy fees. An analogous situation could be imagined with a documentary environment allowing searches in databases of various kinds and the composition of documents given to students in this application. As technologies have evolved, a textbook can legitimately be considered not only as a book given to students and teachers, but also as a documentary environment in which teachers can produce materials according to their needs. The role of public authorities could then be to organize a documentary ecosystem guaranteeing the interoperability and circulation of files financed by public budgets, in particular by imposing the use of open standards and programming interfaces (APIs) for publishers involved in schools. This would facilitate the development of applications for retrieving content from different sources and producing digital or paper documents.

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