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## **Exploring Student and Teacher's Perception of E-textbooks in a Primary School**

**Explorando la percepción de estudiantes y profesor sobre el libro de texto electrónico en educación primaria**

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### **Abstract**

The potential of technology in digital society offers multiple possibilities for learning. E-books constitute one of the technologies to which great attention has to be paid. This article presents a case study on the perceptions held by a teacher and his students on the use of e-textbooks in a primary education classroom. It examines students' meaning-making practices and the perceptions that teachers and students have towards their engagement in learning activities in this context. In the analysis of the data generated, the classroom is considered a multimodal learning space, where virtual, physical and cognitive environments overlap, allowing students to negotiate meaning across multiple contexts and reflect upon it. Results show that e-textbook users' perceptions greatly depend on the institutional culture in which they are embedded. While the adoption of e-textbooks does not necessarily mean a transition from traditional textbooks to e-textbooks, students and teachers may develop a more demanding range of criteria which must be met by e-textbook providers. By doing this, e-books become a real alternative to free internet resources. Although e-textbooks favor a communicatively active style of learning, there are still real challenges to be overcome by publishers so that e-textbooks do not become the next forgotten fad.

### **Resumen**

El potencial que posee la tecnología en el marco de una sociedad digitalizada supone también múltiples oportunidades para el aprendizaje. Los libros electrónicos constituyen una de esas tecnologías a las que hay que prestar especial atención. En este artículo se presenta un estudio de caso sobre la percepción de un profesor y sus estudiantes sobre el uso de un libro de texto electrónico en un aula de educación primaria. Se examinan prácticas de construcción de significado y actitudes mientras se realizan actividades con un libro de texto electrónico. El aula se considera como un espacio de aprendizaje multimodal en el que se solapan entornos como el virtual, el físico y el cognitivo. Los estudiantes negocian significados en múltiples contextos, reflexionando durante el proceso. Los resultados demuestran que la percepción de los usuarios de los libros de texto electrónicos depende de la cultura institucional en la que están inmersos. Cuando su adopción no significa una transición de los libros de texto tradicionales a los libros de texto electrónicos, existe una gama más exigente de criterios a fin de que puedan convertirse en una alternativa real a los recursos disponibles en Internet. Pese a que los libros de texto electrónicos favorecen un

estilo activo y comunicativo de aprendizaje, aún existen desafíos reales que las editoriales deben superar para que el libro de texto electrónico no se convierta en una moda pasajera.

## Keywords / Palabras clave

E-book, textbook, multiple literacy, semiotic, Interaction, teaching resources, ICT, collaborative learning.

Libro electrónico, libro de texto, alfabetización múltiple, semiótica, interacción, recursos didácticos, TIC, aprendizaje colaborativo

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## 1. Introduction

Today's pedagogical practices are largely permeated by the tools and semiotic resources of the digital age, a period which has lately undergone changes metaphorically described as coming from the solid culture of the 19<sup>th</sup> and 20<sup>th</sup> centuries to the liquid information culture of the 21<sup>st</sup> century (Area & Pessoa, 2012). E-books and e-textbooks may be described as examples of such tools, which offer new opportunities as well as challenges for teachers and learners in a continuously evolving educational landscape. In general, good information on book sales is hard to come by since industry interests influence most figures. However, in order to capture the size and scope of the subject, the US market can be taken as an example, where the consistent growth of e-books demonstrates that publishers have successfully evolved the technology environment for their content. According to the 2013 report presented by BookStats, e-books are now fully embedded in the format infrastructure of trade book publishing (BookStats, 2013). In fact, e-books sales have grown 45% since 2011, comprising 20% of the current trade market and playing an integral role in 2012 trade revenue.

This present research paper examines the perceptions that one teacher and his students have towards e-textbooks in an elementary school. Most research conducted on e-textbooks to date has been on undergraduates (Sun, Flores & Tanguma, 2012; Quan-Haase & Martin, 2011; Rose, 2011; Nicholas, Rowlands & Jamali, 2010), who can be expected to have far more sophisticated study techniques and work practices than students who are in elementary school. An increasing number of primary, middle and high schools are in the process of testing out the switch from printed textbooks to e-textbooks. The Educat 1x1 project, launched by the Education Department of Catalonia, Spain, in 2010, is one such initiative (Veguin, 2010). It aims at the progressive introduction of one computer per student, digital books, and other computerized curriculum materials in the classrooms. In a pool aimed at identifying the perception of teachers participating in the project, Padrós-Rodríguez (2011) found that the majority of them do not see the 1x1 project as necessarily related to the adoption of e-textbooks.

In this paper it is discussed how e-textbook adoption raises questions that greatly depend on institutional culture. Attention focuses on the meaning-making practices of a classroom while performing learning activities. Specifically, classroom interaction and participants' feedback and comments made on the experience are analyzed in depth. The objective is to gather data on teacher and students' perception on e-textbook use in the context of an elementary school. Some of the guiding study questions of this present research have been: Do kids have favorable, negative or mixed perceptions on e-textbook use? Do kids and their teacher hold a shared perception on the use of e-textbooks? How does school culture regarding selection of course materials for students influence e-textbook adoption? In writing this paper, we hope to contribute to the understanding of how school culture and classroom idiosyncrasies may pose further considerations regarding whether e-textbooks should be adopted in the classroom.

## **2. Theoretical basis**

The observed classroom is approached as a multimodal learning space, where virtual, physical and cognitive environments overlap. In the first part of the theoretical principals, modality is explored as a useful framework to develop our approach. It leads us to considering e-textbooks as semiotic resources, as will be discussed in the second part of our theoretical basis. In the third part, the relevance of studying student and teacher perceptions on the use of e-textbooks is presented and examined. This way the complexity of pedagogic practices in relation to traditional and new literacy technologies is taken into consideration.

### **2.1. A multimodal lens on digital technology, literacy and learning**

Multimodal literacy emphasizes the fact that schools today do not respond to the multiplicity of texts with which students interact in real life (Kress, 2003; Jewitt, 2006; 2008). Researchers such as Unsworth, Thomas and Bush (2004), Unsworth (2006), Jewitt and Gunther (2003) state that the school continues to focus on the genres of written communication, whereas reality offers multiple modes of communication such as the visual, auditory and gestural.

Significant literature accounts for the technologization of school literacies and pedagogy (Cope & Kalantzis 2000; Lankshear & Knobel, 2003; Marsh, 2005; Leander, 2007). Emerging literacies change the educational landscape (Lankshear & Knobel, 2003; Sefton-Green & Sinker, 2000). Teachers can integrate students' knowledge of narrative characterization into the planning and creation of narratives, either in print (Millard, 2005; Newfield & al., 2003) or multimedia narratives (Burn & Parker, 2003; Marsh, 2006). Multimodal research reflects on the pedagogical use of semiotic resources. This constitutes the point of departure for our study as we understand the transition to e-textbooks is intended to respond to the communicative and technological requirements of a digitalized society. In the following section, we briefly present the definition of the e-textbook used in the present study, taking it as a semiotic resource.

### **2.2. Pedagogical affordances of digital textbooks**

New technologies offer a varied potential for learning. We might expect people's

use of representational and communicative modes of new technologies to reshape the social interaction experience of the classroom in complex ways. Although both publishers and libraries are unsure about the future and the impact of e-books, there is an increasing awareness that e-books demand further attention. As practitioners and researchers embark on a more extensive engagement with e-books, it has progressively become clear that there is major ongoing confusion on the definition of e-books (Lynch, 2001; Tedd, 2005; Edwards & Lonsdale, 2002). We will adhere to Vassiliou and Rowley (2008)'s e-book definition, which will allow us to move further into its pedagogical articulation. Vassiliou and Rowley (2008) define e-books as digital objects with textual and/or other content -semiotic resources, in a multimodal approach-, which arise as a result of integrating the familiar concept of a book with features that can be provided in an electronic environment. The authors claim e-books typically have in-use features such as search and cross reference functions, hypertext links, bookmarks, annotations, highlights, multimedia objects and interactive tools.

### **2.3. Teacher and students' perceptions on e-textbook use**

Dillon (2001a, 2001b) mentioned that school administrators might be interested in e-textbooks because they are relatively cheap, easy to handle, and capable of obtaining usage statistics. Even researchers skeptical of the replacement of analogue to digital reading technologies in schools acknowledge that 'printed textbooks are heavy, quickly outdated, expensive to produce and purchase, and less exciting than the sexy digital content available via devices such as the iPad' (Thayer, 2011: 2). In fact, at least part of the interest on e-textbooks is justified in terms of the need to identify ways to decrease the cost of college textbooks and supplemental resources, while still supporting academic freedom of faculty members to select high quality course materials for students (Reeves & Sampson, 2013).

Most research conducted on e-textbooks to date was aimed at undergraduates (Brint & Hier, 2005; Sun, Flores & Tanguma, 2012; Quan-Haase & Martin, 2011; Ditmyer & al., 201; Rose, 2011; Nicholas, Rowlands & Jamali, 2010) who naturally have far more sophisticated study techniques and work practices than elementary school students. E-texts receive mixed reviews from undergraduate students (Doering, Pereira & Kuechler, 2012; Jung-Yu & Khire, 2012; Lai & Ulhas, 2012; Rockinson- Szapkiw & al. 2013). Do students in elementary schools present as a varied perception on e-textbooks? Comparatively speaking, few studies have turned to schools for the time being and little is yet known about kids' preferences in this subject area. Shiratuddin and Landoni (2002, 2003) found that kindergarten children are very much at ease with e-book technology, being able to use devices, e-books, and e-book builder without much effort. Obviously enough, their school level allows no inference on whether they would rather use traditional or e-textbooks. More recently, Shamir and Lifshitz (2013) examined the effect of activity with an educational electronic book (e-book), with/without metacognitive guidance, on the emergent literacy (rhyming) and emergent math (essence of addition, ordinal numbers) again of kindergartners, this time at risk for learning disability (LD). The researchers concluded that there was a significant

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improvement in the study variables among the two groups of subjects who worked with the e-book when compared to the control group, the experimental group that received metacognitive guidance as part of their e-book experience exhibiting greatest improvement in rhyming.

Thayer (2011) suggests elementary school students would benefit more from the replacement of printed textbooks with e-readers and slate computers, since young people typically have more malleable study habits and academic reading practices than undergraduate students. Though not specifically approaching e-books or e-textbooks, Burke and Rowsell (2008) developed a case study over digital reading practices of young adolescents. It highlighted the complexity of the critical skills young adolescents need to comprehend interactive texts. In the next section, we describe our study on the perception of students and teachers in an elementary school in Spain on e-textbook use.

### **3. Study method**

The study questions which guided our reflections were: 1) Do kids have favorable, negative or mixed perceptions on e-textbook use?; 2) Do kids and their teacher hold a shared perception on the use of e-textbooks?; 3) How does school culture regarding selection of course materials for students influence e-textbook adoption? A case study approach (Yin, 1994, Yuen, Law & Wong, 2003; Hoseth & McLure, 2012) guided by multimodal principles (Jewitt, 2006; Knight, 2011) was adopted.

#### **3.1. Data gathering**

Three sources of data were used: 1) Video recording and class observational notes. In-depth focus group interviews, 2) E-textbook online platform. The data language is Catalan, the official language spoken in Catalonia, Spain. Whenever data transcripts are relevant to support analysis presentation, an English version of them will be provided.

#### **3.2. Sampling**

The school chosen for the study is a public primary school which does not use traditional textbooks. 14 students were involved in this study, 11 and 12 year olds. They are all Catalan speakers. All students in the observed group had computers at home and all, but one, had Internet connection. In class, each student had a laptop with access to internet and user name and password to access the e-textbook online platform. The teacher in charge of the group has been in this school for five years and has been the school technology planning coordinator for three years. He is 29 years old and uses technology in his classrooms on a regular basis to teach mathematics, social sciences and language.

#### **3.3. Data gathering**

##### **3.3.1. Lessons observation**

The recordings lasted around 40 minutes each and took place in the participants' usual classroom, a bright aired room which was a familiar setting for them. The classes seem to have had three distinct moments, however, there is no abrupt

end and beginning of a new phase: 1) First students began getting in the classroom, settling down, turning computers on and connecting to internet. The teacher gave brief instructions on the activity that the students were supposed to do and organized group sittings of students who had chosen to study the same period of history together. He also helped some students access the digital pedagogical materials on the server's online platform. Altogether, this phase lasted about 10 minutes, though, occasionally, one or more students experienced more connections problems than the rest of the class. 2) In the second phase, students would concentrate in reviewing the information available in the e-textbook and in doing the activities the teacher had assigned them on the online platform. This phase lasted about 15 minutes. 3) In the last part of the classes, students would start to do the self correction of their activities. Most of them share their assessment grade with other students and/or the teacher and some of them ask the teacher why they were corrected in a particular way by the e-textbook. For most of the students, the teacher revises the digital textbook correction looking at their own laptops, but a few of the students would occasionally get their correction on the class digital board. This final part of the classes lasted about 15-18 minutes.

### 3.3.2. Focus group interviews

The focus group interviews were conducted at two different levels: student level and teacher level. The teacher interview lasted 25 minutes. Students were interviewed in groups with 3 or 4 participants. These interviews lasted approximately 10 minutes. All interviews were semi-structured. With consent from the respondents, all the discussions and interviews were video recorded.

### 3.3.3. The e-textbook

The e-textbook under analysis is available to students on an online educational platform managed by an e-learning content service provider. Each lesson was structured in six parts which can be accessed by a curved verbal side bar menu or from an iconic lateral menu, as can be seen in figure 1.



**Figure 1. History e-textbook under analysis.**

The lessons are organized as follows:

- Get down to work – Students can find introductory text, images and activities.
- Let's explore – Generally relates the content under study in the lesson to the students' previous knowledge through self-correcting activities like quizzes, drag and drops, cross words, ordering letters or open questions.
- Let's learn – Content is presented through a combination of text, images and animations.
- Applying knowledge – Students are expected to form groups and do activities that may involve interaction with their classmates and teacher, less dependent on technology.
- Wrapping it up – Students can find a list of the things they have learned in the lesson.
- Activity menu – Students have access to all the activities which are presented in the different parts of the lesson.

There are no videos in the materials selected by the teacher for the classes observed, neither links to Internet sources of related content. In the lateral side bar menu students could also find a link to a printable version of the unit, in PDF format.

The class recordings and field notes were reviewed and discussed by the authors. This information allowed us to prepare the semi-structured approach of the focus group interviews. At the data analysis phase, the interviews were inductively open coded for emergent themes and analyzed for patterns using grounded theory approach.

#### 4. Analysis and results

Four main themes emerged out of the analysis of the interviews:

- Classroom roles – From the initial 5 minutes, when the teacher would tell the students what activity each group should do, there was no moment when all students were listening to the teacher. Students usually reviewed the content they had assigned to their group and did the corresponding activities. Those who had doubts on the corrections they received from the e-textbook raised their hands or called out the teacher's name – something that happened pretty often. Students also extensively spoke to their classmates, especially in the self correction phase and after it, making comments on their punctuation, boasting, expressing surprise or complaining about it. The teacher frequently used the digital board to review the answers given by some students and at this moment some other students would listen to what was being said about their colleague's activity correction.
- Mutual support – Though the teacher instructs the students to do the activity individually, this recommendation is taken in very flexible terms both by the students and by the teacher. When performing the activity, students would frequently check what was on their classmate's screen, point at it, ask and answer questions. It was usually only after not being able to solve a difficulty by asking nearby colleagues that students would raise their

hands and ask for the teacher's help. The unsolved doubt of a student would become a shared doubt of many students as a consequence of presenting a challenge that none of the students seated near each other could solve. Such doubts could be technical aspects - especially if in the first phase of the class-, related to content, to the activities procedure or feedback, or more generally to the functioning of the e-textbook.

- Complementary literacy technologies – We identified the coexistence of traditional and digital literacy technologies in the pedagogical practice of the teacher in charge of the observed group. For example, apart from drawing on digital resources like the e-textbook lessons the group was using to study different periods of history, the students also created a timeline where they identified historical periods, outstanding historical characters and relevant facts for each period. The timeline was placed on the classroom walls.

It is not surprising that teachers draw on traditional and digital resources in different moments to achieve their pedagogical objectives. However, in the observed classes, the teacher drew on both traditional and digital technologies simultaneously. At the beginning of class, the teacher would give the students printed versions of the lessons they were supposed to study. This means all students received a printed document of the PDF which was available to students online as an option in the e-textbook menu. The teacher had three reasons for doing that: He felt it was important to have an alternative in case the computers did not work properly or Internet was too slow; 2) He thought the printed documents would be useful for the kids at home; 3) He wanted to avoid students from getting lost, in case menu navigation was not enough to help them.

- Most students drew on the printed versions of the lessons extensively, checking the computer screen and the paper documents in turns, as can be seen in figure 2) We asked the students if they thought the paper versions of the lessons were necessary. All students but one agreed they would not need them. However, class recordings show students looked for information as much on the printed documents as on the computer screen. In the focus group interviews, students explained they used the printed documents as a personal note taking resource. It seems reading on the screen was an easier step to accomplish than writing down the information they personally considered most important.



**Figure 2. Student drawing on e-textbooks on screen and in its printed version simultaneously.**

- A shared view, different perceptions - When we asked the study participants how well they valued the e-textbooks, we found that the students and the teacher both shared a common view on it, but different perceptions regarding this view. The common view is that both the teacher and the students think the e-textbook used in their history project classes presents very specific, concrete information. This shared view of the digital resource, however, leads to different perceptions on it. While the students liked the resource style, highlighting the easiness to find the information they wanted to do the activities proposed, the teacher valued it negatively because it offered students a limited amount of information.

All students said they liked the e-textbook and they actually preferred using it to traditional textbooks. However, they also seemed to find the information presented in the material insufficient, since one recurrent theme in the focus group interviews was the possibility to complete the information using search engines, like Google, or complementary sources of content, like Wikipedia. The students actually did not seem to draw a definite line distinguishing the e-textbook from other digital resources.

Easiness to do activities and find information, the possibility to see images and videos, and the novelty of e-textbooks were the positive aspects of e-textbooks highlighted by the students. The teacher, on the other hand, was less attracted than students by e-textbooks. The teacher also had a list of other limitations which will probably hinder future e-textbook adoption in the case school. First, the teacher acknowledged this generation of e-textbooks is better than previous materials, which were simply PDFs, but he still missed more multimodal content.

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Secondly, the perspective given in the materials is frequently farfetched from a more local view of relevant facts.

Thirdly, the teacher thought the economic limitation would be an important obstacle for the adoption of the e-textbook at the case school. The school would have to pay to use the platform and also pay for the educational resources. In the case school, teachers were supposed to develop the curriculum drawing extensively on their own ability to find and elaborate pedagogical materials. In this situation, e-textbooks would have to offer a richness of form and content which does not convince the teacher we interviewed for the moment: «You can find it all on the Internet, and here (e-textbooks) you have to pay. You have to pay for the platform and for the educational resources. If you have it well structured, you can find it all on the net» (Teacher).

Notwithstanding the more than reluctant perception the teacher expressed on e-textbooks, we could notice the students clearly enjoyed using it. We asked the teacher if the students simply enjoyed anything or if he thought there was something special about this material that was calling their attention: «These students are happy to come to school. They want to learn, they like anything that is new to them. I think some time in the future, after they grow up like this, using so much technology, you will give them a sheet of paper and they will «aaaaau», a sheet of paper. That's so cool» (Teacher). In this respect, the teacher's perception is that the reason the e-textbook is a success among students is in their own predisposition to learn, on the one hand, and on the resource's novelty, on the other one.

## 5. Discussion and conclusion

The use of e-textbooks in the case classroom favored a sort of distributed learning. The teacher was definitely not the protagonist. Students' work was something intermediate between being individual and collaborative. Additionally, the classroom was both a rich and supportive environment. Not being the centre of attention of the classroom gave the teacher enough freedom of movement to assist those students who requested his presence. There was also plenty of peer to peer support. Combined, those two results seem to indicate positive aspects of e-textbook use, even if they are not specific of this semiotic resource. It is obvious any digital learning object can produce such results, but the fact that an e-textbook does it is something notorious in itself. It shows that even if e-textbooks are not as multimodal as they could be, including videos and sound in the content presentation, they also do not seem to favor traditional teacher centered approaches in which the teacher is the main source of feedback in the classroom.

Literacy technologies change fast, pedagogical practices do not. The case classroom observations showed there was a symbiotic interaction of digital and non digital technologies. The pictures and drawings which changed the classroom wall into a timeline, for example, constitute semiotic work which compliments in symbiotic ways the work done while students engaged with the e-textbooks. Also, while students were using the e-textbook itself, they often referred to the printed version of the lesson provided by their teacher. It is possible they did not need the printed materials, but the class observation clearly shows students extensively use them as scaffolds. There is no simple way to take all the richness of sym-

bolic meaning going on during a classroom into account. Multimodal theory is clearly an attempt to, from the acknowledgement of the diversity of data available to the analyst, makes an effort to systematize impressions not always easy to reconcile. If the analyst only takes into account clear cut realities presented in objective data, much of the meaning making practices going on during the most ordinary classroom will simply be disregarded, though the richness of the evidence. We asked at the beginning of this paper if kids have favorable, negative or mixed perceptions on e-textbook use, if the kids and their teacher hold a shared perception on the use of e-textbooks and how school culture regarding selection of course materials for students influence e-textbook adoption. Kids participating in this research hold favorable perceptions on e-textbooks. The students enjoyed using the e-textbook and reported preferring it to traditional textbooks, however expressing the need to compliment its information using search engines, like Google, or complementary sources of content, like Wikipedia. The students are not always able to distinguish the e-textbook from other digital resources: the computer (in the case of this present research), the Ipad or the e-book reader seems to be what kids identify as the learning object, not the semiotic resources which educators make available to them on the different pieces of technology they use.

As mentioned above, the students and the teacher basically shared a common view on the e-textbook, but different perceptions regarding the specific e-textbook used. The common view is that the e-textbook used in their history project classes presents very specific, concrete information. The differing perception is that while the students liked the resource style, highlighting the easiness to find the information they wanted to do the activities proposed, the teacher valued it negatively because it offered students a limited amount of information. Finally, it could be said that e-textbook users' perceptions greatly depend on the institutional culture in which they are embedded. In contexts like the case school, where the adoption of e-textbooks does not mean a transition from traditional textbooks to e-textbooks, students and teachers may develop a more demanding range of criteria which will have to be met by e-textbook providers so as they can become a real alternative to all the resources teachers can find for free on the Internet. The results of this study indicate that although e-textbooks favor a communicative active style of learning and are attractive to elementary school students, there still are real challenges to be overcome by editorials so that e-textbooks do not become the next forgotten fad.

## 6. Limitations and Ethical considerations

The purpose of this research is not to make any generalized claims on e-textbook use or perception. Thus, the relevance of our case study should be understood as illustrative rather than definitive. More research will be needed to shed light on the wider scope of this intellectual endeavor.

Permission must be requested for the video recordings to be shown with the research team, allowing short clips, stills and photos to be used for teaching and dissemination purposes.

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