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LEARNING AND TEACHING USING DIGITAL BOOKS: OPPORTUNITIES AND CONSTRAINTS

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Abstract:
It is increasingly noticeable that society is constantly evolving in a complex way and school life reflects this strong influence. Therefore education also becomes a very complex and ever-changing organization. This social scenario urges us to focus on the quality of education, placing the teacher at its core and on the quality of the pedagogical intervention. This leads us to some questions: Do teachers reflect on their teaching? Do teachers question the way they teach? Do teachers justify the use of the teaching materials they select? What about the methods they use? Do they identify the results of their teaching? Taking into account the teaching strategies that they use and the learning process, do teachers question those results and how to improve?
With these concerns, it is essential to link the use of strategies that assume the effective and enriching development of theoretical and practical interaction processes to the learning and teaching using digital books: opportunities and constraints. It is in this context that we will present the main results of a qualitative research held in a public school. Twelve teachers of the first cycle of basic education have participated in this study.

Key words: learning; teaching; digital books; teacher training.

1. Introduction

According to Prensky (2001), children and young people in today's context – the so-called "digital natives" handle the information and communication technologies (ICT) with ease. He states that their brain is ready for the new requirements of a digital culture and world. In contrast, older people - their ancestors and the so-called "immigrants" to digital technology - would have more difficulty to survive in this new digital scenario that did not exist when they were born or even when they were teenagers.

Nevertheless, Lagarto (2013) finds no evidence that children and young people are in fact digitally competent. It appears that these children and young people (as well as the general public) need training on issues related to the tools of the Information Society which aims to metamorphose into a knowledge society, such as defended by some authors (Adams, 2007; Almeida, 2004; Moreira, 2007). We can therefore infer that living in a digital world requires a learning time, more or less according to the individual characteristics. At the same time, we know that children and young people are immersed in technology and interact with it naturally as it can be seen in a study of Dahlstrom & Bishsel (2014), where they interviewed about 1 and a half million students in 74 countries. Education and schools in particular are currently faced with a new fact, namely: both students and teachers, through the Internet, have quick and easy access to all kinds of existing information in the world. The digitization of almost all-human activity and in all dimensions is already a reality at school.

According to Lagarto (2015),

> In reality, the paradigms with which today have to teach cannot be the same as they were a few decades ago. Today, at school, students are true "digital natives" because they were born in a digital age, but what is happening is that they, like the migrants, do not truly master most of features of the tools provided by the Information Society and from Internet (p. 18).

Live, grow, live and communicate in a digital society or immersed in a digital culture means radical differences in the ways one processes information, how to socialize, how to interact, how to build knowledge and, finally, how to learn (Prensky, 2001). Siemens (2006) presents eight factors that characterize the present-day knowledge and promote consequences in terms of the characteristics of knowledge itself, which obviously implies the learning modelization, namely:

i. Abundance - the knowledge available on the network is immense and the speed at which it is produced and published is so fast that we are taken to meet the limit concept in the way we relate to such information volume;

ii. Recombination - the ability to connect, recombine and re-create small meaning cores, sprouted more complex and personalized structures, surpassing the time of convergence of knowledge: the new reality is the transfer and implementation of knowledge from one field to another;

iii. Relationship with the certainty - the knowledge is presented as a constant becoming, in which certain (final) is permanently suspended by the constant need to update regarding new data and new findings;

iv. Development pace - more important and significant than the knowledge we have at any given time it´s the ability to learn what we´ll need in the future; towards the

inability to assimilate all the knowledge that we will need, the priority is the link to media networks and information sources that put us in case of need;

v. Performance - through the media and the media rich contexts, the knowledge gained multiple faces, and can be expressed in various forms such as, for example, a video or a game;

vi. Flow - an economy of knowledge, responsiveness and motivation as individuals internal elements, or a culture of openness and the recognition of the value of collaboration, while external elements, act as accelerators flow, facilitating quick processes of knowledge production and distribution, as well as networks creation;

vii. Spaces and structures for knowledge organization and dissemination - the spaces and structures are the organizational elements of society, and as the former constitute the environment in which we interact and share, the latter provide the process and the way by which we make decisions and knowledge flows;

viii. Decentralization - openness to decentralization of knowledge, as individuals are active organizers of individual agents deciding how aggregates and organizes information that interests them.

If we establish formal ways of learning, in times where learning can mean so much, it is an urgent task to reflect on the epistemological requirements in order to provide to learners an increasing development of skills (self) regulatory, to allow them learning to learn - either along their academic record or on all entire experiential and formative experience throughout life. It is precisely in this context (and taking into account a modeling of learning that promotes learning strategies, time management, objectives definition, self-assessment, self-efficacy beliefs and intrinsic interest) which we regard as elementary epistemological requirement, a strategy for learning or strategic learning, fundamental in promoting individuals able to succeed in training context and life (Zimmerman, 2002). This epistemological requirement - strategic learning - develops in individuals/learners metacognitive, motivational and behavioral processes, stimulating and providing the creation of opportunities for the exercise of self-regulation, especially at the level of educational goals definition. These self-regulatory processes are clearly another epistemological requirement and a key component for a strategic learning that promotes undoubtedly reflection. This can (and should) be taught and trained, resulting hence the crucial role of the education professional by participation in training opportunities that provide a path of gradual construction of autonomy, strategic ability and motivation levels in learning.

There is no doubt that the traditional school methods seem not to have great relevance in today's learning processes. Information Technology is not to solve all educational issues; however, we cannot neglect these tools and the way these favor the construction of knowledge. Without a true democratization of access to ICT, users cannot take full advantage of the features that the digital world provides them (Lagarto, 2015). This is also a mission of the School and, as such, it is up to teachers to include ICT in their teaching, including digital books.

2. Changing context and teacher training

As Elmore (2003) states: "successful professional development - as it is specifically designed to also improve student learning - must be evaluated continuously and primarily on

the basis of the effect it has on the results of students" (p. 8). So one of the guiding principles of training (initial and continuous) for teachers should be the way it contributes to the development of the learning of teachers and, ultimately, effective student learning.

In this context, teachers must have the qualifications and skills required for teaching performance and learning throughout life, based on an educational project that includes a professional, social and ethical dimension of the teaching activity; a dimension of teaching and learning development in the framework of an outstanding pedagogical relationship, that integrates accurate scientific and methodological knowledge of that development; a dimension of participation in school and community relations; a dimension of professional development throughout life, incorporating training as a constitutive element of professional practice by problematized analysis of teaching and reflection based on the construction of the profession in cooperation with other professionals; and a dimension of research and pedagogical innovation agent, taking into account the reflective and creator role in the educational process that educators / teachers are to perform collaboratively.

Among the emerging challenges that educational institutions have to currently face, we have to consider the diversity of people with multiple cultures, knowledge and skills in a plurality of ways of being, living and thinking that contribute to the construction of the person as a whole in a global world. Faced with an increasingly complex society, so often broken in their fundamental structures, it is crucial to build the foundations of an educational relationship based on Values, Knowledge and Reference Practices.

Paraphrasing Bolívar (2012,), "after all, the quality of education operates in the *teaching and learning processes* experienced in class, even if, so that they occur, they are accompanied by other factors (...)" (p. 286). More than other distant variables, the differences in student learning outcomes require a focus on teaching practice and distinctive work of the teacher, involving the use of various educational resources (such as digital books), more active and diverse methodologies. Hence the challenge is to make teaching attractive, as well as (re)set up schools in challenging contexts of learning, because, as the report of the OECD (2005) shows, to rely on good teachers is a warranty of good, meaningful and effective learning experiences.

In this context, teaching practice should be aligned with the requirements that are more and more placed on the profession under the current educational landscape, the contingencies of today's society and the contours of an increasingly digital culture. It is in this perspective that we must seek to ensure that the teachers prove able to create different frameworks and educational tools that promote success.

We therefore agree with the view of Korthagen (2010) when he proposes a focused approach to problems and emerging concerns of real contexts, the systematic reflection of teachers about their thinking and their action, which should be a continuous process of awareness and practice reconstruction. This implies, in our view, solid knowledge, and distinctive didactics, apart from learning to be and live.

3. Empirical research formulation

Society is constantly evolving in a complex way and school life reflects this strong influence. As a consequence we see that education as a very complex and ever-changing organization. This social scenario urges us to focus on the quality of education, placing the

teacher at its core and on the quality of the pedagogical intervention. This leads us to some questions: Do teachers reflect on their teaching? Do teachers question the way they teach? Do teachers justify the use of the teaching materials they select? What about the methods they use? Do they identify the results of their teaching? Taking into account the teaching strategies that they use and the learning process, do teachers question those results and how to improve? With these concerns, it is essential to link the use of strategies that assume the effective and enriching development of theoretical and practical interaction processes to the learning and teaching using digital books: opportunities and constraints.

The methodology used for this study is qualitative. According to Bogdan (1994) "the objective of the qualitative researchers is to better understand the human experience and behavior" (p.70). Almeida (2007) believes that the qualitative research "cannot be done without the own perspective of the individuals that are part of the situations being studied" (p. 25), thus considering the qualitative methods more holistic and embracing. Bogdan (1994) characterizes the qualitative approach as descriptive, as it aims at explaining multiple realities, highlighting that some so its limitations are the fact that it is time-consuming, is challenging when it comes to data analysis, the procedures are not standardized, being the researcher a in fully contact with the individuals. Some well-known theories (as an example Bogdan, 1994) question the representativity of a qualitative study, as in these studies a limited number of individuals are questioned.

This qualitative approach is aligned with an interpretative research paradigm that, according to some authors, (Bogdan e Biklen, 1994; Lessard-Hébert, 1994), results from the rising interest in the educational issues, consisting of knowing the subject and being aware of the context, in the quest of understanding the several phenomena.

Having this in mind, we agree with Denzin & Lincoln (1994, in Aires, 2011) when they consider that the qualitative research "involves an interpretative and naturalistic approach of the subject of analysis" (p. 2).

Our present study is an exploratory one as we acknowledge that there are not as many studies on this matter in our country that allow us to support our investigation. In fact, our worries are focusing a relatively recent field of investigation with constant law changes. According to Yin (2005,), "an exploratory study (...) can address the issue or problem that is under exploration, the exploration methods, findings from the exploration and conclusions (for further research)" (p. 183*). Moreover, we stress the idea of Yin (2005) that the case study follows on when you want to better understand a phenomenon, a situation that should be significant, being widely used in the social sciences.

However, in this study, it was our intention to perform a case study both due to the nature of the phenomenon (bound by a space), the participants (convenience sample) and the temporal issue. In this regard, we still consider the public theory by Theodorson and Theodorson (1970), who present the following definition of exploratory study,

> A preliminary study the major purpose of which is to become familiar with a phenomenon that is to investigate, so that the major study to follow may be designed with greater understanding and precision. The exploratory study (which may use any of a variety of techniques, usually with a small sample) permits the investigator to define his research problem (…) (p. 142).

Despite the complexity of what we are researching, our methodological options include clear and appropriate objectives when it comes to the methodology we have adopted.

Again, we consider the thoughts of Yin (2005) that highlight the following about the exploratory study: "it should present a purpose and the criteria that will be used to measure if it was successful" (p. 42-43). In other words, it is necessary to present an objective and the methodology; such is our case, in the course of the research work.

In a study it is important how data collection is performed, placing it within a "geographical and social space" (Quivy and Campenhoudt, 1992). Our research was developed in two teacher training schools, situated in the district of Porto.

The research data collection techniques that we used were the Interview Survey (semi-structured script) and direct observation, reported by several authors (Lessard-Hébert, 1994; Quivy and Campenhoudt, 1992; Yin, 2005).

Yin (2005) stresses the importance of gathering data in multiple ways, using various data collection instruments in order to allow triangulation of data, which allows corroboration of them. The diversity of data collection techniques will allow the confrontation of the information collected, essential in a research of this nature.

Lessard-Hébert (1994) reports that the Interview Survey is among the techniques used in qualitative research. Representative people are interviewed expressing themselves on the subject matter. Consequently, the investigators show a growing interest in the subject. In our research, we used the interview with a semi-structured script, since in this type of interview the researcher asks the interviewee useful information to fulfill the established goals, set regardless of the person questioned. (...) The direction of the research is presented in a directive way and the answers to the introductory questions will serve as a starting point for conducting the rest of the interview (Albarello et al, 1997).

So our choice of this technique is linked to the purpose of knowing the perceptions of interviewees about the advantages and constraints of the use of digital books in the teaching and learning process. However, the interviewer should set an atmosphere of trust so that there is interaction with the interviewee, as it is crucial to establish an empathic relationship. We had this concern when implementing the survey interview.

Thus, we wrote a semi-structured script, directed to teachers, meeting the defined goals, as well as the selected topics, seeking comprehensiveness in order to provide a wide range of information on the perceptions of respondents regarding topics that we consider relevant. In order to validate the aforementioned script and understand the interest of this investigation we previously applied the interview survey to a group of teachers not participating in our study (exploratory interview) ensuring that the topics would meet our goals. Participants were informed both about the aims and purposes of our research and the confidentiality. The interviews were audio-recorded and later transcribed. Then, the transcription/research protocol was provided to each of the respondents to if it were their desire to provide a possible revision of the content. We emphasize that no change was necessary.

So we applied the survey technique interview to the participants of our study, observed two department meetings and analyzed documents we considered relevant.

With regard to direct / participant observation, some researchers (Bruyne et al, cited by Lessard-Hébert, 1994; Yin, 2006) differentiate the direct observation from participant observation. Direct observation allows the researcher to observe and collect data (Yin here includes observation of meetings), gathering evidence about what we are investigating. Here

the researcher has a passive role. In participant observation, the researcher collects data and participates actively interacting socially with their object of study. Quivy and Champenhoudt (1992) consider participant observation as a variant of direct observation. Lopes (1996) refers that it is difficult to distinguish direct from the participant observation, stressing, however, that direct observation is governed "by anonymity codes and impersonality" (p. 89), noting that the researcher may limit the visual and auditory observation, depending on the methodological options. These authors are unanimous when it comes to state that the observer can influence the observed context, and even the way the observed react.

In our case, we selected two lessons in different months to apply this information gathering technique. The results are presented in the analysis and discussion of research data.

For the treatment of research data, we used the content analysis technique, proceeding to the categorization and coding data, as it will be presented later.

Content analysis, as an analysis technique of collected data, follows the observation of certain requirements, including "the meaning (content) ... the shape and distribution of content and forms" (Bardin, 2006, p. 38).

Almeida (2007), highlights the content analysis within the qualitative method as the one that "takes place with data from interviews, documents, (...)" (p. 25). Content analysis reported by Quivy and Campenhoudt (1992) and Bardin (2006) as categorical analysis belongs to the method of thematic analysis. According to Quivy and Campenhoudt (1992), the categorical analysis "is to calculate and compare the frequency of certain characteristics (...) previously grouped into meaningful categories." The categories resulting from the categorical analysis "(...) (p. 266) are items or classes, which bring together a group of elements (registration units in the case of content analysis) under a generic title, done because of the common characteristics of these elements" (Bardin, 2006, p. 111).

In this context, we carried out a categorical analysis, observing a set of criteria - mutual exclusion, consistency, completeness, relevance, productivity and objectivity, being the categorization valid if it fits the objectives of the investigation, both by its importance (relevance) and to provide a set of meaningful data for this and / or other studies (productivity).

Based on these criteria, which led to the categories we defined, we proceeded to its codification in record units that, according to Vala (2001 in Lima and Pacheco, 2006) "(...) are the particular content segment that is characterized by placing it into a given category " (p. 25). This is "composed of a key term that indicates the central meaning of the concept one wants to grasp, and other indicators describing the semantic field of the concept" (ibid). With regard to codification of the registration units that is required in the application of information processing technique, it was possible to obtain a diverse and oscillating number of indicators that informed the understanding of the category, taking into account the perspective of the respondents.

In the case of this study, the categories defined as well as the registration units also represent inferences of the researcher himself; therefore, the content analysis technique has both a descriptive dimension - gives us what is "said" - and an interpretative dimension - that comes from the investigator when trying to better know the subject matter.

Based on the research topic, and after a brief reading of the transcript of the interviews - research protocol - to facilitate the process of content analysis and triangulation of the data collected, we defined what, in our view, corresponds to each category. The formulation of the categories resulted from the selected topics, and yet left open some emerging categories of the analysis of collected data.

The context in which the research took place was a set of schools (composed by eight educational establishments, from kindergarten to a secondary school), all located in Campanhã, Porto, composed in academic year 2006-2007. This grouping is covered by the third generation of Program of Educational Territories of Priority Intervention (TEIP3). This schoolyear, the school population is 2,284 students: 256 (12 groups) attend pre-school education, 792 (56 classrooms) in the 1st cycle of Primary Education, 354 (18 classrooms) in the 2nd cycle of Primary Education, 446 (22 classrooms) in the 3rd cycle of Primary Education, 32 (two classrooms) of Education and Training Integrated Program, 54 (four classrooms) in Education and Training Courses, 200 (10 classrooms) in the scientific-humanistic secondary courses, 14 (one classroom) in Technological Sport Course and 136 (eight classrooms) in professional courses. 99% of students have Portuguese nationality, 38.1% do not benefit from economic support under the social school action; 42% of primary students and 53% of secondary students have a computer with an Internet connection at home. The analysis of parents and/or responsible for educational attainment shows that the percentage of parents of students in primary and secondary school with higher studies is, respectively, 3% and 2%, and with secondary and higher education is 13% and 10%, respectively.

The teaching staff consists of 238 members, of whom 73.5% are career teachers and 78.6% with 10 or more years of teaching practice. The non-teaching staff, mostly with employment contract in public functions for an indefinite period, is composed of 86 professional: a psychologist, two social service techniques, one social educator, a head of school administration services, an operational charge and 80 technical/operational assistants. The group also counts with 14 trainers for vocational courses.

The values of context variables, including the percentages of students without financial aid in the field of school social action, the low average of mothers' educational attainment and the percentage of tenured teachers, were below the median values recorded in schools within the same reference group, revealing very unfavorable context variables.

4. Results: presentation and discussion

For the development of our empirical work, including the writing of the semi-structured script of the interview survey, that was applied in academic year to twelve teachers from 1st cycle of a a primary education school, we looked at the overall goal of the research - "understand the perceptions of teachers regarding learning and teaching using digital books " – and we addressed the following themes, having in mind the setting up of a category system: conceptions about the act of teaching; construction of knowledge; strategies used in teaching; tools / materials used in the teaching process ; potential of digital books ; limitations of digital books.

Based on these themes, and after a brief reading of the transcript of the interviews - research protocol – and in order to facilitate the process of content analysis and triangulation

of the data collected, we defined what, in our view, corresponded to each category. Please note that the formulation of the categories resulted from the selected topics. However we left some categories open that would emerge from the analysis of the collected data.

Regarding the perception that teachers have of the act of teaching (category A), we find that they recognize "the need to diversify the ways of teaching, taking into account the different learning styles" (T7), stressing the importance of reflective professional development, shared with colleagues aiming at its improvement.

Regarding category B, the construction of knowledge, we find that teachers have a different views on this matter: while some highlight the teacher's role, perceived as decisive in the construction of knowledge, others point particularly to the curriculum management as well as the type of strategies and resources they plan to use: "when we are planning, together with peers, we try to take into account the different forms of knowledge construction" (T11); "I think the teacher should also create these resources, because if we have different classes, we have to diversify strategies in order to get to what we intend to" (T1); "The textbook alone is not enough, and there has to be the creation and be more dynamic in the use and creation of various materials and resources" (T8) "and this requires also the use digital resources" (T3).

With regard to favorite strategies (category C), participants are unanimous referring activities that are frequent, allowing the teacher to spend more time with each student; activities that "seek to meet the particular difficulties of each student " – (T10) – more personalizes teaching; and activities that contribute to good classroom management, "the use of ICT benefit the management of school time, including digital books" (T8). Teachers stated, although not systematically, that digital books are a key feature in differentiation, taking into account a more personalized, dynamic teaching and respect for multiple intelligences identified by Gardner (1998).

As far as the opinion of the interviewees about tools / materials used in the teaching process is concerned – category D -, all stress diversity as an asset. They highlight digital resources, because the students show up more motivated for learning ("become more focused and satisfied when using ICT" - T4), in addition to other qualities of these materials, "interactivity" (T8, T11, T12) "collaboration" (T8, T9), "regulated learning" (T1, T5).

Regarding the penultimate category, teachers were unanimous in concluding that the use of books digital poses a major challenge to the teaching process (they are useful for some teachers who understand their role in a logic of continuous learning and for most a constraint, because they are at a distinct disadvantage when compared to their students and what they are already able to do). The great advantages identified by teachers lead us to a more flexible teaching process, "custom" (T1, T2, T6, T7, T11 and T12), which clearly enhances "a journey of more autonomous learning" (T7) and, therefore, more "meaningful" (T2) and "current" (T8), in line with the challenges of a world and a more "digital school" (T4) that you want more "critical and human" (T2).

As far as limitations are concerned (category F), we find that teachers point essentially to the lack of training and lack of time for preparing lessons involving the use of these resources - "lack of time to plan lessons well" (T12); "I have trouble controlling the class and what students actually are doing "(T3). Teachers also point out "technical, scientific and didactic" (T9, T10) limitations, often resulting from the lack of proper training.

As mentioned earlier, we used direct / participant observation as a tool in our research. We participated in two classes of six of the interviewed teachers, the first taking

place in late September and the second in early May of the academic year 2014/15. From the observations we clearly understand that: teachers effectively give more autonomy to the students when they use the digital books, a fact is highly valued by both the teachers and the students and that really makes a difference in the established relationships and results. However, there is at the same time the difficult perception on the part of teachers, about what the "explicit teaching" is and regarding the model of monitoring and evaluation of students, through another way of teaching.

Teachers already have many resources when they want to regulate learning, but that still does not constitutes a clear pedagogical model, with common traits acknowledged by all professionals, communicable to other teachers in their schools, and even to other schools. When teachers use technological resources, it is still evident a lack of confidence in themselves and among each other. This is visible, for example, when there is a mutual opening of classrooms, which is only possible when there is trust and collaboration made over the years, applying all the best that each can achieve. When this happens student motivation is evident, as well as how they significantly engage in learning to do.

As a summary, the results seem to be aligned with the view of Rodríguez, Bruillard and Horsley (2015):

> Textbooks play such a key role because education is profoundly based upon reading, writing and books. But, with the growing importance of digital technologies and their huge impact upon nearly all human activities, some changes seem unavoidable. Textbooks have to take into account digital technology. This issue is not new, and digital technology (ICT) is used in education for more than fifty years. It provides new environments, used at home or in classrooms, opens new opportunities for teaching and learning… But for a long time, we can observe a sort of coexistence between textbooks on the one side and digital technology on the other side. Now, the encounter can be considered more intimate, as textbooks themselves become digital. This current transformation raises many issues. We can quote some of them (p. 10).

5. Conclusion

According to Adell (2007), the use of technological software incorporates very similar values to those that should be promoted in public schooling - freedom, transparency, collaboration, innovation, flexibility, independence and, as such, the use of digital books is perfectly justifiable for a variety of reasons, as the study results show.

Teaching and learning in the information society, in which ICT should not be neglected in the teaching-learning process, led us to particularly reflect on the digital books as an important tool in redefining the teaching practice. We have pointed out before that the teaching practice and the teacher work are directly related to the learning outcomes (Bolívar, 2012, p. *no.* 286). By incorporating more active and diverse methodologies in the everyday work in the classrooms, the teacher is promoting effective and meaningful learning experiences.

It was found that current technologies are effectively promoting a new way of teaching, resulting in significant consequences in the way of learning, since they are a more effective response to social demands and the interests of this new generation. Digital books are an example of a teaching tool more suited to contemporary times, investing in dynamic

and personalized learning that promotes the creation, production and collaboration. This model comes to challenge the traditional teaching model that essentially encourages memorization, repetition and therefore uncritical reproduction. We can easily see that the use of digital books, as a way of incorporating technology in the learning and teaching context, comes to challenge all the teachers who choose to be aligned with the current increasingly digital culture, as we have seen before, and as our participants have stated. Korthagen (2010) highlighted the importance of systematic reflection, so that teachers could clearly understand the emerging contexts and the necessary adjustments to their performance, so that they could be in line with the modern society demands.

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