The Digital Textbook: New Learning Paradigms in Primary Education – A Portuguese Pilot Project

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Abstract

This chapter presents the preliminary results of a three-year project on digital textbooks made available on a tablet, taking place in the Cuba school district of the Portuguese Alentejo region. The project involved two classes of seven graders. We will focus the analysis on student behaviour and attitudes. The research draws upon a questionnaire whose goals were to evaluate the digital proficiency of students, to understand their perceptions and to evaluate the project's impact on learning and grades. Upon examination of the results, it becomes clear that students feel more motivated but this motivation does not correlate with grade improvement.

Even at this preliminary stage, the research highlights the importance of a paradigm shift in the teaching process and the need to focus on acquiring skills rather than on improving grades.

1. Connected Readership

Readers worldwide are taking up new reading practices and the opportunities offered by mobile devices such as smartphones, tablets, and eReaders (Baron, 2015; Cardoso, 2015; Rainie, 2012). Mobility is increasingly important in people's daily lives (Unesco, 2014) and as such we have to take it into close consideration when researching on readership (Baron, 2013). The practice of reading has always been mobile, but the new digital environment offers a new kind of mobility, “a mobility that is connected, networked and collaborative” (Cardoso, Ganito & Ferreira, 2012). We now speak of locative media (Frith, 2015) as, besides content, context also plays a major role.

Mobility contexts are often used as a time to read, and connected devices allow not only to carry a greater amount of books, but also to take advantage of being online to enhance the reading activity, by accessing complementary information or having the possibility to easily manage a digital library or reading notes. Mobile digital reading is also a more private practice, although it may, at the same time, be a more connected one – it occurs in devices that tend to be personal [and hardly sharable] and users may take advantage of the private-public space of the internet, while reading on devices that do not have an identifying cover that would allow others to know what is being read.

The survey on digital reading[1] allows us to map the global digital reading landscape, including Portugal. One of the main conclusions is that reading matters (Cardoso, 2015). In response to the question "when purchasing a device with internet access, was the ability to read texts such as books, magazines or newspapers important in your purchase decision", 61% of the global sample answered affirmatively. Books are definitely going digital with the majority of the respondents, 58%, having already read a book in digital format. Another conclusion that can be drawn from this survey, in line with previous research (Griswold & Wright, 2004), is that digital reading often functions as an extension of paper, as the individuals who read more on paper are also the ones reading more in digital formats. Hence, digital reading should not be regarded as a replacement activity but rather a cumulative one.

A common misconception of digital reading dismissed by the results of the survey is that age functions as an obstacle to the uptake, whilst, as with so many other digital practices, it is much more correlated with the level of education than age itself (Cardoso, 2015). Thus, one of the main challenges posed by the technological dimension of digital reading is the development of digital literacy skills (OCDE, 2015).

2. Digital Technologies and Learning

Fifteen years ago Prensky (2001) posited that young people, "digital natives" (idem), handled digital tools easily and their brain were thus preformatted for the new demands

[1] 'Digital Reading and the Transformation of Reading Stimulus and of Book Institutions' (2015). Online Survey of 16 countries: Australia, Brazil, Canada, China, France, Germany, India, Italy, Mexico, Portugal, Russia, South Africa, Spain, Turkey, United Kingdom, United States of America

of a digital world. In contrast older people, “digital immigrants” (ibidem), would find it more difficult to survive in the new digital environment, which did not exist when they were born or even when they were teenagers. This has been taken up by other authors (Obliger & Oblinger, 2005) and has been very popular in the media.

Subsequent studies (Bennett, S., Maton, K., & Kervin, L., 2008; Buckingham & Willett, 2006; Cardoso, G., & Espanha, R. (Ed.)., 2010; Davies *et al*, 2014; Lagarto, 2013; White, D. S., & Le Cornu, A. (2011); White, D. S., Manton, M., & Le Cornu, A., 2009).) have shown there is no evidence that young people are in fact more digitally competent and that they may, indeed, require training on issues concerning digital tools. And if younger people lack this training, the elder, "digital immigrants" (Prensky, 2001), need to understand the mechanisms of these new tools. We can therefore infer that to live in a digital world requires a learning period, which may be more or less prolonged depending on individual characteristics.

Nevertheless, it can be asserted that young people are immersed in technology and engage with it in a natural way, as shown in a study by EDUCAUSE (Dahlstrom & Bishsel, 2014), which questioned about 1.5 million students in 74 countries. However, being a "digital native" (Prensky, 2001) does not necessarily confer competence. Each individual should move towards acquiring a non-digital innate intelligence, a kind of digital wisdom according to Prensky (2009), and that could be the basis of full citizenship.

In deploying technology rich environments, we must therefore take into account some of these fundamental aspects. No less important is the issue of access. Without a true democratization of access to technology and the Internet, users can not take full advantage of the features that the digital world is able to provide (Lagarto, 2013; Bennet, Maton & Kevin, 2009; Cardoso & Espanha, 2010; White & Le Cornu, 2011).

2.2.Digital Technologies and the Learning Experience

There are several research studies that seek to understand whether or not there is a positive impact of ICT on student learning. It has been suggested that the use of ICT

may increase the level of involvement and motivation, in particular students and teachers (Dwyer *et al*, 2007; Clark, W., & Luckin, R. 2013; Clarke, B., & Svanaes, S., 2014; Balanskat, A., 2013; Nishizak, D. M., 2015). Even parents, when requested to express their opinion, commonly indicate that children have a more positive attitude towards homework and feel encouraged to talk more about school activities (Burden, Hopkins, Male, Martin & Trala, 2012). This type of learning is enhanced if developed by teachers who believe students learn more and better with ICT. Beliefs, knowledge and skills of the actors play a key role here.

However, other studies have claimed that ICT do not necessarily imply a better teaching/learning process. For example, a research project carried out at the State University of Campinas (Dwyer *et al*, 2007) conducted a literature review to establish a connection between the use and non use of computers in schools and student's performance. The researchers were able to conclude that students at the three levels of education under analysis (students from the 4th and 8th level of elementary school and the 3rd year of middle school), regardless of social class, had a lower school performance when they used the computer intensively. In the case of the poorest students in the 4th grade, the moderate use of computer worsened the exam results of Portuguese and Mathematics. This study also concluded that students who did not use the computer had worse exam results than those who rarely used it.

Another study conducted in Quebec with more than 6.000 students (grade 6-10) and 300 teachers, who had previously not used the iPad for learning tasks, concluded that "few or no students or teachers reported that the touchpads enabled them to learn more" (Karsenti, T., & Fievez, A. 2013: p. 40).

However, the number of studies that clearly demonstrate how the integration of ICT in education favours the learning process, in addition to developing skills that go beyond the cognitive, is much higher. The use of ICT is thus being considered a major oportunity in education, one that goes behond the formal curricula (Law, Pelgrum & Plomo, quoted in Tornero, & Pi, 2013; Heinrich, P., 2012; Clarke e Svanaes, 2014).

The ICT Impact Report (Balanskat, A., & Blamire, R., 2007) tried to establish a direct causal link between the use of ICT and the results of students in examinations and tests, and indicated, already in 2006, a relatively clear positive impact of ICT in the learning process. When the European Schoolnet study was conducted, tablets had not yet appeared and the study included only computers and laptops, although there were

already references to the concept of mobile learning. The results presented seemed to make clear the positive impact of technology on students learning processes.

2.3. From the computer to the tablet: what makes it different?

With the current uptake of laptops and tablets, an in-depth discussion of common trends among PC and tablets usage is much needed.

The scarce existing literature on the subject has shown, interestingly, that one of the first advantages identified in the use of tablets at school has to do with reducing the weight of backpacks (Hallissy, Gallagher, Ryan and Hurley, 2013). But there are other advantages related to the use of tablets in the classroom. Students report that, with their tablets, they communicate more online with peers and teachers, and access useful information to work in the classroom much faster (Clarke, B. & Svanaes, S., 2014).

Despite studies questioning the effectiveness of ICT (and tablets) in learning processes (Clark & Luckin, 2013; Hu, 2011), there are already substantial investigations indicating that students show more motivation to study and refer positively the collaborative work that they are more likely to develop with their colleagues. In a study on the responses of students regarding the use of the Ipad, by Hallissy, Gallagher, Ryan and Hurley (2013), it appears that, in general, students replied very favourably to the use of iPads, referring an increase in terms of how and when iPads are used. The technology could thus prove effective in the processes of teaching and learning. However, it should be taken into account that the use of tablets cannot be an end in itself but a beginning (Hallissy et al 2013). In fact, for a successful implementation of the use of ICT (and tablets), teacher training will always be a crucial aspect (Hallissy et al., 2013).

Johnson, Adams and Cummins (2012), in the NMC Horizon Report: 2012 K-12 Edition, make a prospective analysis of the importance that technologies can have for students and teachers of secondary schools. Among several findings, the Report highlights the inevitability of a growing penetration of technology in the lives of citizens, the gradual change of teaching paradigms, and the investment in tablet use policies, allowing equipment for students (1:1) in learning areas.

The NMC also refers to a strong short-term trend (in 2013) with the rapid evolution of two types of technology - smartphones and tablets. Mobile phones, although often still banned from the classroom and school, have started to exhibit obvious utility features for learning. Tablets now include features that promote reading, and the price at which these devices are now available on the market makes them superior as utility tools to laptops and smartphones (Johnson, Adams & Cummins, 2012).

We can conclude that there is significant consensus on research into the benefits of using tablets in teaching and learning processes. If the weight of the school bags appeared at the top of the advantages, particularly for parents, there is also some convergence on students' motivation, which is higher now, on greater involvement in collaborative learning, and on the perception of increasing digital literacy of students and teachers.

Undoubtedly, all these factors will contribute to better learning and are not always easy to observe, given the many variables at play in assessment practices, particularly summative.

Parents, in general, seem receptive to innovation and understand that the use of technology in school is beneficial. However, they still show some reluctance in relation to security, associated costs and, in some cases, the effectiveness of the equipment in the learning process (Clark e Luckin, 2013).

Another positive dimension of using tablets is related to its ubiquity and the ease with which students can easily access informal learning sources. Students are also more motivated to personalize the device, adjusting the features to their personal tastes and learning styles. Personalized access and individual ownership are reported as being key factors in a successful adoption process (Clark & Luckin, 2013).

Finally, one might also take into account cases such as the one referenced in Clark and Luckin (2013), where researchers had access to students' files and were able to identify what apps they were installing. Tablets function as a support for the development of skills associated with specific needs such as reading difficulties.

Considering all relevant available literature, we can state that the use of tablets, when framed by a well organized implementation process, can play a positive role in student learning. The motivation, the ability to communicate faster and more often, informal learning and ubiquity justify this assumption.

Issues such as cost, misuse, damage, network problems, or the smaller digital skills, may not override the increase in motivation and school productivity, enthusiasm, interest, commitment, creativity, independence and self-regulation (Burden et al, 2012; NMC, 2012; cited by Clark & Luckin, 2013: p. 25).

Based on these evidences, we have been tracking a pilot project on digital textbooks. The results of the first year of the project are presented in the next section.

3. The Pilot Project: Digital Textbooks

The project on digital textbooks (ManEEle), coordinated by the General Directorate of Education - Management Services of the Alentejo Region, was implemented within Cuba's School Cluster, with two classes of the 3rd cycle of basic education. The project started in September 2013 and involved two classes that were then in 7th grade, foreseeing its monitoring over the entire cycle route.

With an expected duration of three years, this pilot project was organized in two stages. The first phase, covering the school year 2013/2014, focused on students and teachers adapting to the use of textbooks in digital format, made available on a tablet, whilst simultaneously verifying which technological solution would be the most appropriate methodology for educational strategies and diagnosing any obstacles to this educational experience. With this first stage of diagnosis and evaluation, one could draw conclusions that would allow the modification of future actions. As such, over this first year of implementation, an exploratory study was developed to identify difficulties and provide insights for future improvement of the project. The second stage, corresponding to the two subsequent school years, refers to the main phase of project implementation with the "use of advanced technologies and teaching methods in order to provide students with more and better learning" (ManEEle project).

3.1. Methodology

Ongoing research focuses on issues related to the impact caused by replacing paper manuals with digital textbooks on tablets, students' behaviour and attitudes. The study also includes an analysis of the attitudes of teachers, parents and school leaders

regarding the use of digital educational resources available on mobile devices. This is a predominantly qualitative and descriptive research and it involves two groups that started the seventh grade in September 2013, at the Cuban School District, a total of 17 teachers, 42 students and their parents[2].

An ongoing longitudinal researh was establish to anticipate difficulties and provide insight for improvements. As a starting point, the following central research question was defined: "What is the impact of replacing textbooks with digital educational resources available on tablets?"

From this central issue, and taking into account the objectives foreseen for research, a set of sub-questions was outlined. In this chapter, we will present the results of the survey on students, whilst follow-up research will analyse responses from teachers and families. The goals and questions related to students are summarized in Figure 1.

Goals	Sub-questions
Evaluate the digital proficiency of students, in particular as regards the handling of equipment and software used in the study	Do students demonstrate digital proficiency to handle the equipment and software appropriate to the study?
Unveil students perceptions about their motivation and development activities and expertise in a technology-enhanced environment	Have students become more motivated and developed in class activities and skills not previously developed in technologically enriched environments?
Evaluate project impact on students learning and grades	Has student learning materialized in rankings and, when compared to previous school years, do they fall under normal standards for this grade level?

Figure 1. Objectives and research sub-questions

Monitoring of the first year of the experiment was conducted through the use of various instruments, and those included questionnaires to students, teachers and parents,

interviews (focus group) to students and teachers, classroom observation and document analysis, particularly of late period reports, per class.

3.2.Data Analysis

With the start-up year of the project completed, it was important to assess the impact of using the tablet and the degree of satisfaction of students, teachers and parents. Thus, between May and June 2014, questionnaires were applied to each of these audiences and then analyzed autonomously. In the following sub-sections, we will focus our analysis on students.

3.2.1. The Students

The questionnaire to students applied by the year director in May 2014 received 37 valid responses, which corresponds to 88% of the seventh grade students involved in the project, of which 57% were male. Data analysis shows that the connection between family and school is usually established through the mother, since mothers are the ones in charge of education in 86% of the cases. Situations in which the father (8%), siblings (3%) and grandparents (3%) appear as guardians are uncommon. Regarding the educational background of parents, it is also the mother who shows the highest level of education: 54% attended secondary or higher education and only 35% of fathers were in the same situation.

Before school year 2013/2014 started, all students, except for one, had access to a tablet or computer in their family background. The notebook was present in 84% of households and possession of tablets approached computers, covering a little more than half of respondents. It should be emphasized that before the project began, nearly half of students (43%) did not have exclusive use of the computer in the family context. For this group of students, the project enabled the tablet to become an element of personal use which was previously non-existent.

The space where children access the Internet has an impact on several factors such as portability, privacy and security. For students participating in our study, prior to the

start of school year 2013/2014, almost all (97%) had Internet access at home. This percentage is higher than the results obtained by the Survey Network Society 2013 (Cardoso, Mendonça Lima, Paisana, & Neves, 2014), according to which only 57% of Portuguese households had Internet connection.

As in the rest of Europe, another Internet service space was the home of friends or relatives (41%), although the percentage is slightly below the European average as mentioned in the project EU Kids Online (53% of European children connect to a network at friends' house). In contrast, before the implementation of the project, school was a space where Internet use was of little relevance, with no students referring to its use in the classroom, with teachers. Although about half the students accessed the Internet via mobile devices such as the mobile phone (51%) and tablet (46%), the computer was still the preferred equipment (89%).

When asked about three activities (play, study and communication with friends and family) that academic literature has mentioned as the most common among children and young people, it was determined that values were much lower than those mentioned in other studies. So Ólafsson, Livingstone and Haddon (2013) report that over 80% of children between 9 and 16 years old use the Internet to play or perform work related to school. For seventh year students of the Cuban grouping, only a quarter claimed they used the Internet to study and less than 40% considered that the use was for games (37%) or had a communicative purpose (38 %).

One of teachers concerns when dealing with the Internet is linked to the dangers of its use and how to control them, or the parental mediation that should be exercised. In our study, almost half of students (49%) reported that parents let them be on the computer whenever they wanted to, while the others, except for one who had no computer, indicated that there were rules for its use.

The questionnaire included indicators such as tablet use practices, difficulties encountered with its use, the scope of mobility and value assigned to it, and how parental mediation is perceived. What types of activity have students held with the tablet? To answer this question, we focused our research on four activities: three of them related to school work (writing notes, recording videos and taking pictures), the other associated with games: 62% stated the tablet is not used daily to play and only a minority (16%) agreed that it was used for play.

Video recording and photographing with the tablet for school work are activities not rooted in the practices of most students, with only a residual percentage performing it frequently. Although it is still higher than the percentage of those who frequently use the tablet to write lecture notes (16%), the truth is that 38% report not to do it. These results allow us to infer that teachers do not often seek out this type of activities, which in some curriculum areas could be very useful: audio recording in teaching a foreign language, video in visual education, etc.

The diversity of applications (apps) available and the possibility of customization of access and tablet use, tailoring it to individual user needs, are two of the potential areas recognized by researchers in this field that can be used in education (Clark & Luckin, 2013; Johnson et al, 2013). Given this premise, we questioned students about the applications they downloaded to their tablet, in addition to the ones that were originally installed. It is noteworthy that the majority (62%) mention not having downloaded any application. However, within the space reserved for comments in the questionnaire, a student said that "there should be more control over the apps installed in some of the tablets". Thus, at a subsequent stage of research, it would be important to understand the reasons that lead to such a small percentage of apps downloaded, especially when one considers that "personal access" and "single use" are two of the elements that affect the successful adoption and effective use of mobile devices (Burden et al., 2012, quoted by Clark & Luckin, 2013).

As for digital literacy, 62% of students expressed full agreement with the statement "it is easy to use tablets" and more than half (54%) indicated they did not have difficulties using it. However, we must not forget that for four students (11%) the use of tablet was not easy, and almost a quarter clearly admitted difficulties, whilst 32% had problems reading the manuals on these mobile devices. If we add the 27% of undecided, we have here a clear reason for concern.

Confirming their status as digital natives, the data gathered reveal that students feel autonomous using the equipment, as they generally do not ask for help to solve problems. Only 11% admitted asking their parents for help to use the tablet. Yet, more than 70% of students confirmed that their parents have tried to learn something more about the tablets, which shows some engagement in the school life of their children.

The use of digital technologies can bring about generational conflicts within the family. We placed a question that tried to identify this and found that 16% of students report the existence of conflicts, which coincides with the results of questionnaires given to parents. These conflicts may indicate that parents believe their children use the equipment improperly and impose rules and restrictions.

As a positive factor, it should be highlighted that more than half of students say that they show their work on tablets to parents and guardians, revealing still a trustful family relationship.

Related to these conflicting issues may be the imposition of rules for the use of computers in the family context. Several issues such as the safe use of the Internet can justify this option. About 40% of students report parental monitoring, which for many of them does not lead to any conflict.

It is also important to know what kind of rules were imposed by parents. We found that parents involved in the experiment have attitudes that are recommended in the literature on the safe use of the Internet, namely the establishment of rules for the type of applications that the children can use (43%) and the use of the site of the tablets (33%). Interestingly, only 20% of parents impose rules on the time of use. There are still parents (5%) that only allow the use of the tablet to study.

As might be expected, most students agree that they do not spend too much time using the tablet. Only 14% (N=3) state clearly that they are aware of spending too much time using the equipment. This seems normal since, although the technology is pervasive, it did not seduce young alike.

As for the impact on the teaching/learning process, students report that tablets motivate them to school (43%), but few reveal they read the manual more now (only 22%), or like to do homework more (35% say no). About half of the students explicitly declared that they like to read books on paper more than on the tablet.

This question seems rather contradictory between perceived motivation and practices. We assume that this result has to do with the fact that this was the first year of the experience and it is likely to change over the three years of the project.

However, it should be noted that, in the perception of students, teachers do not teach better - only 16% said they learned better - and students do not learn more with tablets than with books - only 24% said they learned better with tablets.

It is recurrent in literature on tablets to mention the communicational effect that they promote, in particular by facilitating the exchange of messages between peers and between students and teachers themselves (Clark & Luckin, 2013: p. 13). In fact, students refer that and, without any doubt, communicate more with peers and teachers due to tablet use (41%, in addition to the 38% of undecided on this finding). The perception of the economic impact of tablets, with regard to reducing the costs of manuals, was also one of the indicators used in our questionnaire. In this case, 57% of students considered it positively because it sidesteps paying for the books. In the space reserved for comments or suggestions regarding the project, one of the students reinforced this idea noting: "I think this project is good because we do not spend money to buy the books."

In addition to hindering the mobility and some of the recreational activities of children and youth, excess weight in backpacks can lead to changes in body posture at the level of the spine ("lumbar hyperlordosis, cervical tilt"), shoulders ("gap and protrusion of the shoulder, scapula winged ") and lower limbs ("increased valgus angle of the knee") (Santos et al., 2009). Thus, students were questioned whether tablets were good because they helped avoiding heavy backpacks, and most students (62%) expressed complete agreement with the statement.

And how do students perceive the value of the project? If it were them, would this project be extended to the whole school? Students responses are divided almost equally between those who would generalize tablets to other classes and those who have the opposite view. One student wrote as an observation that he considered this project "more innovative and more motivating", while another recorded it was "bad." Based on these data, we considered it important to uncover the legitimate reasons for these opinions. Again, the space reserved for comments concerning the project suggests some interpretative clues. It should be stressed that two students answered "no" to the generalization of tablets, but the observations mentioned "Tablets are very good", or in question 18 [If it were up to you, would this project be extended to the whole school?] said “no because only our class is deserving". Therefore, in general, students like the

project, but if it were extended to other classes, they would no longer have exclusive participation in something innovative. This positive social evaluation of the idea of the device (tablet ownership) and the elevation of the status of groups over the others is also present in the review of a third student: although not widened to the entire school, he said that "this project could also be offered to the students in 8th year". It must be recalled that in the following school year, these students will be in Eighth Year.

Conclusion: do they learn more?

These findings focus primarily on the student dimension of the research project and on answering the sub-questions related to enhancing the learning process.
As for the concern whether students demonstrate digital proficiency, students, for the most part, state that they do not have problems with the use of tablets. They affirm that they do not use the tablet daily for games, and that they are more motivated by the simple use of the equipment. In addition, they do not ask for help from parents or teachers to use the tablet. However, we find that they have downloaded games, and some (a few) students deleted the school manual in order to get more space for their recreational activities.

Another important question is related to motivation. The research tried to confirm whether students have become more motivated and able to develop in-class activities and skills that they did not develop in non-technologically enriched environments. In fact, students consider that they feel more motivated to use the tablet, a view shared by teachers. However, this motivation does not have proper matching in school results. Albeit not substantially, students end up using the tablet in activities that would not exist without it. Naturally and steadily, access to manuals, but also research activities on the Internet, were performed with some frequency, allowing students to acquire multiple skills.

The low level of use of other features, in addition to access to digital textbooks, also holds up with the attitude of teachers who, throughout the year, did not request much tablet use for other activities. It should be noted that students have the perception that they do not learn more by having the tablet, and most of them prefer reading the manual on paper than on the tablet. In any case, more than half of the students stated that they

took notes on the tablet, and 16% of them indicated that they did it quite often. About 30% of students took photographs and made short videos for schoolwork.

Finally, the study sought to assess if the student learning process materialized in their grades and, when compared to previous school years, if it fell under normal standards for this grade level. The study we conducted is not conclusive and is not even completed. Nevertheless, we should note that, at the end of the year, in a joint meeting, it became clear that, in general, expectations had been exceeded. In fact, analyzing the profile of students grades, it would appear that the tablet has not had a negative impact on learning. The requirement stated by teachers, the grades obtained and the number of students retained show that students would not have had better grades and would not have had learned more if they had had nothing but the tablet to access the school textbook. In fact, we can say that even in one of the target disciplines (Portuguese), students maintained their average scores of the previous year.

What are then the critical success factors for the integration of tablets and digital textbooks in the teaching-learning process? A global analysis of the data obtained in this research work allows us to identify a set of factors that can contribute to the successful implementation of the use of tablets in the learning process. This change in strategy can effectively start by replacing the manual on paper for digital books, but it also can, and should, allow the use of a diverse set of existing digital tools to support learning and enable a paradigm shift in teaching processes. Thus, the analysis of available data, including literature, suggests that there are critical factors that must be taken into account in the planning of a project of this nature. We pointed out a set of recommendations that should be taken into consideration in planning and implementing projects aimed at introducing tablets in the classroom and replacing paper manuals with digital textbooks.

Tablets must display appropriate characteristics to their use, including robustness, large data storage and good processing speed. It is necessary to take into account the need of technical support for hardware and software that eliminates operating constraints of equipment and peripherals. Also, wireless networks should have bandwidth and high coverage on campus.

Teachers should be provided with training in the use of tablets and in innovative teaching practices, in order to refocus the learning process on students. This training

must be done on an ongoing basis within the school, but also in close coordination with Training Centres and Universities.

Institutional leadership must offer express and effective support to the changes you want to see implemented in their educational territory.

Communities of practice of teachers for performance enhancement and sharing practices should be induced using virtual environments appropriate to learning.

Parents and guardians should be involved systematically in this process, guiding them to monitor the students in their learning and in particular for the proper use of Internet at home.

The school library and teachers should combine efforts to articulate their work and contribute to the continued promotion of the use of digital media for reading, in addition to the digital manual.

Local (municipalities, businesses and other organizations) or national (publishers) partnerships must be created as costs associated with digital manuals are substantially lower to printed manuals.

Students must also have continuous monitoring, ICT classes or clubs / workshops to learn how to use ICT and tablets. Their digital proficiency does not often exceed the games and the use of social media. Writing a text or making a presentation can be tasks that pose unexpected problems.

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