

The Educational Role of the Information and Communication Technologies (ICT): a Study of an Intervention in a Portuguese Basic Level School

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This paper is the result of a research made in a private school of the primary education in Portugal. It was intended to draw a realistic picture of the potentialities of the practical use of the ICT by the school community, namely the teachers, the pupils of the third level and their parents. With this purpose, and in a partnership with a group of teachers of different subjects of the third level of the primary education, a computer science platform, called *A Turma do Vasquinho (Vasquinho's Class)*, was drawn and implemented. From the evidence found there have emerged substantive indicators which allow us to conclude that the ICT will actually be able to make come true their most precious pedagogical added value, in our opinion: the potential for educational innovation which may transform the way how the education partners (pupils, teachers and parents) learn, feel and live school.

Keywords: Education; School; Learning; Primary Education; Information and Communication Technologies (ICT), Internet, Computer Science Platform.

1. Introduction

The huge numbers of deep social, economic and cultural changes which have taken place in the beginning of this century have shattered the traditional pedagogical models, creating the need for building a new education project being able to help you face the challenges of the globalise society, where we live. It is in this context that the concept of a learning school [1] comes up, an interactive school, generating learning in individual and global terms.

But to make this school able to help the citizen face the new challenges ahead in this network society [2], there is the absolute need to improve its teaching and learning quality. The use of computer science resources assumes a crucial role in this process. For the first time in the history of the pedagogical thought, it is admitted that the ICT may actually transform the educational pattern inherited from Thorndike, and which determined the school model which has been dominant for decades [3].

However the simple use of technology does not mean in itself the improvement of education. Technology is what you can do with it; it is the way it is used that can revolutionise or perpetuate the present-day teaching structure. The traditional idea of school is still so deeply rooted in imagery and the attitudes of its actors that, whenever innovating ways for adopting technology are proposed, we tend to imagine how it can mainly help with the improvement of the pedagogical methods already known, and rarely do we rethink the fundamental processes operating in the school environment. This is one of the reasons why the introduction of the ICT into some school environments has often helped keep the same old routines – the teacher speaks, the pupil listens – with some varnish of modernity. Technologies are utilised more as a tool used by the teacher to present curriculum contents than to generate new pedagogical challenges for the pupils.

Anyway, since school is a territory strongly characterised by the traditional culture of teaching and learning, we can already find in the different levels of education “islands of innovation”, where the ICT have had a relevant role because they are an educational field where pedagogical innovation has in fact been created. In many schools the ICT have actually been an engine for innovation and pedagogical change. And, bearing in mind the purpose of contribute to the change and innovation in a particular private

school of the primary education system in Portugal, that this investigation was established and developed.

2. Conceptual Framing: School in the Society of Information and Knowledge

Facing the demands of the hectic society of information and knowledge [4], education issues are beginning to be considered in a completely different light. It is society that understands the limits of the isolated school, and, by contrast, defends and supports the connection of all the schools in a network, originating communities of knowledge and trying to push society in general into its nucleus.

The information and knowledge society demands school should be a place where you learn to enjoy learning, where you can find a meaning for what you are doing, where you begin a trip to the realm of knowledge, where you may find paths, where you can encourage, motivate and respect the individuals' own rhythm and feelings. In other words, an education not based simply upon a type of merely passive and reproductive knowledge but, in fact, an education which is the outcome of active thinking, and can keep alive the knowledge you get [5].

To implement a meaningful reformation in education, it is crucial to direct the action to the school central unit, the classroom, and try to ratify the way you implement learning in the classroom. The ICT can, in this sense, become an important support tool, able to help alter the teaching experience, abandoning the traditional method, which originates routine learning, in favour of more dynamic and meaningful learning. In this case the computer can play a crucial role while an auxiliary teaching tool at the service of the teachers who have abandoned the chalkboard world [6].

The arrival of the electronic communications networks such as the Internet is, on the other hand, bringing added computer science and pedagogical challenges into the classroom. The Internet has created a new universal space for sharing information and co-operation. The interactivity issue is highly relevant in this context because of what it can mean in terms of the transformations of the teaching and learning strategies. This is in fact even more important when it allows the pupil and the teacher's work to go beyond the classroom and into their home, as it is shown in Figure 1.

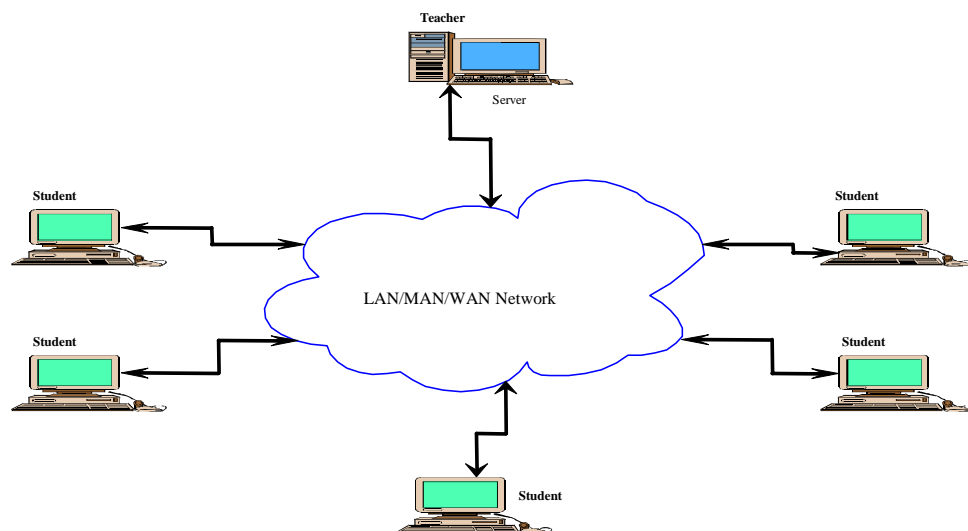


Figure 1: Example of the interconnections typical of a virtual classroom.

In this picture the classroom will become more and more a place of departure and arrival, an important space which mixes with other spaces to amplify the learning possibilities, producing a communications

system which allows a group of people to meet together to talk about something they want to learn [7]. This educational model will tend to bring near the teachers and pupils to their families and to the community where they live, making possible the development of knowledge, abilities and skills which will make possible learning through life.

In the new educational model, the teaching practice will be based on the pupil's freedom so he can build his own convictions, his own knowledge and his own moral principles. This does not mean to reduce the importance of the curriculum or the teacher's knowledge, since the teachers will, as [8] said, become the tutors who accompany and give orientation to the pupils while selecting all the information available, be it through the technologies and interactive communications, or using the traditional tools.

3. Methodology

This research, made in a private primary school in Portugal, represents a methodological approach which, in global terms, is similar to a case study. With it, it was intended to draw a realistic picture of the potentialities of the practical use of the ICT by the school community, namely, the teachers, the pupils and their parents.

The study implied two long methodological stages. The first one had as its main purpose the actual and consistently structured introduction of the ICT in the school context. With this purpose, and in a partnership with a group of teachers who teach different subjects to the third level of primary education, a computer science platform, called *A Turma do Vasquinho*, was drawn and implemented. Even though it had a strong didactic intention, particularly while a tool to help the pupils' teaching and learning, this platform was targeted mainly to strengthen living in the school as a learning organisation, making the co-operation bonds between its players stronger, most notably the parents' involvement in their children's education.

In the second stage, and based on a set of diversified methodological procedures, among which there stand out direct observation, participated and from a distance, half-structured interview and questionnaire survey, we tried to analyse the way the pupils (118), their parents (118) and the teachers (24) were evaluating the impact of the educational intervention made and, consequently, the integration of the ICT in the school dynamics.

4. Results

The evidence analysed here amounts to a small sample, even though representative, of the whole huge empirical corpus, which was the result of the enlarged project from which this paper is a part. The results shown in this section concretely concern only a part of the results which were obtained using the questionnaires mentioned in the previous item. The section is divided into two parts. In the first one there is the description of the notions the education players seemed to have about the use of the ICT in school; in the latter there are introduced some indicators of the evaluation made by the pupils, the teachers and the parents concerning the computer science platform which was implemented in school.

4.1 Conceptions about the Integration of the ICT in School

As Figure 2 illustrates, in relation with the parents, the results obtained allow us to conclude that they would agree that the use of the ICT in education is crucial nowadays, not only because they would make the lessons more attractive, namely accessing the Internet, but also because they would help the teachers to improve their teaching techniques.

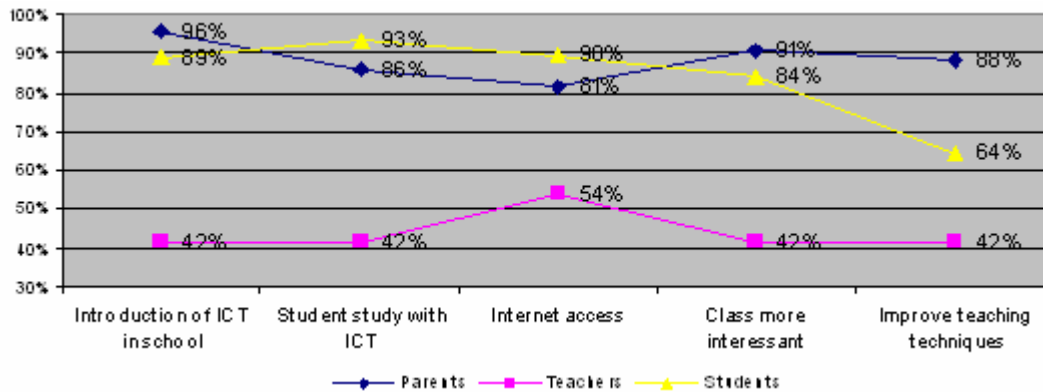


Figure 2: Conceptions about the integration of the ICT in School.

As to the teachers who were being surveyed, they seemed to have a less enthusiastic opinion (Figure 2) about the introduction of the ICT in their school. Only 42% of the teachers admitted the importance of teaching with these technologies. Such moderation appears, in fact, reflected in all the other considered indicators. In spite of this we have found a meaningful group of teachers who admit the pedagogic usefulness of accessing the Internet.

Finally, the results of the students (Figure 2), show that they tend to support the introduction of the ICT in their school, reaching such support a similar level of what was expressed by the parents and being revealed much higher to the evidenced by the teachers. The reasons for this option appear, because when the students are using technological resources their lessons become more attractive. Due to the fact, that the teachers involved in this study aren't, in general, very enthusiasts with the introduction of the ICT in their classroom, that can be the motive why 36% of the students do not approve the idea that ICT improvement the teaching techniques.

4.2 Evaluation of the Computer Science Platform *A Turma do Vasquinho*

As we observe in the Figure 3, concerning the three samples, it was the parents that give a major positive evaluation to *A Turma do Vasquinho*. The number of parents who had already used this working platform (57% of the total) showed, in a great majority, a tendency to support high adhesion levels, in all the five indicators.

However, in questionnaire data not illustrated in this paper, they recommend that *A Turma do Vasquinho* should allow real-time contact between them and all the other partners involved in the educational phenomenon. The point of view of these parents is that making school and home nearer incentives the development of an educational community.

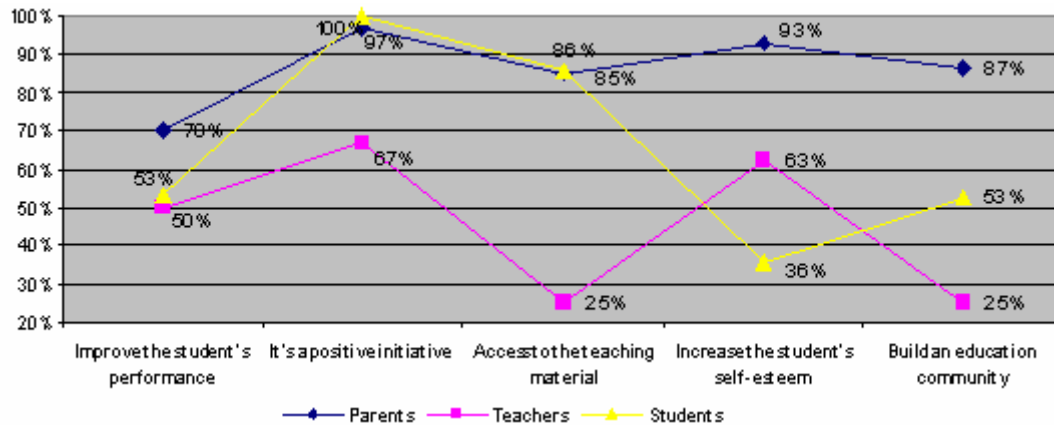


Figure 3: Evaluation of the Computer Science Platform *A Turma do Vasquinho*.

Concerning the teachers, as it was illustrated in Figure 3, the results we have got, allow us to conclude that this sample was, clearly, the less enthusiastic group regarding the pedagogical innovation represented by the *A Turma do Vasquinho*. Nevertheless, they would agree on the existence of computer science platform (67%), because they admit that this platform might help either with the improvement of the student's performance (50%), or with strengthening the pupil's self-esteem (63%).

However, we have not found a strong position concerning, either if the computer science platform can give to the development of the teaching material which will be used in the classroom (25%), or the belief that *A Turma do Vasquinho* may help build an education community (25%).

Concerning the students, the evidence collected and illustrated in Figure 3, allow us to conclude that this group of persons give a positive evaluation to *A Turma do Vasquinho*. The results position this sample between the parents (more favourable) and the teachers (less favourable). As his parents, the data allow us to show clearly the idea that for the students this computer science platform assumes a crucial role in their daily school routine (100%), namely because the *A Turma do Vasquinho* is making possible the access to the curricular contents presented in the classroom (86%).

The students, however, tend to moderately accept the supposition that with this computer science platform it is possible to enhance either their school performance (53%), or helping to build an education community (53%). Finally, the students do not approve the idea that *A Turma do Vasquinho* might help strengthening the pupil's self-esteem (36%) while he presents his work to his partners.

5. Conclusion

According to the results of this research, there are substantive indicators which allow us to conclude that the parents and the pupils support the integration of the ICT in the school environment. To this agreement may eventually be connected the fact that technology has contributed to the development of the ideas that the tutors have about what their children can do and how they learn [9]. On the other hand, the children's wish to use technological tools can be explained by the circumstance of their adaptation to the user's speed and timing [4]. As to the teachers, they seem to have a more thoughtful position. Eventually this position may be explained by the circumstance, as [5] mentioned, that it is not possible for you to change your ideas overnight, ideas that have been maturing day by day and have proved to be correct by experimentation. However the knowledge society, in which we live, cannot wait for a new generation of teachers who feel more familiar with these tools. The teacher is a key element in the power a country has to develop [4].

Assuming that the expectations each one of us has about school are made up upon a number of patterns, cultural modals and collected experiments which identify our model of society, *A Turma do Vasquinho*,

has made possible the communication among the education partners and learning in community [1]. Admitting that the educational technology to be useful depends on the teachers' ability to use it, and that the family assumes a large part of the responsibility for its children's education when it helps them to move within this new technological world [2], we have the intuition that the ICT can in fact make come true what we consider their greatest added pedagogical value: the potential for the educational innovation, which can change the way how the pupils, the teachers and the tutors learn, feel and live school.

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