

# **Challenges of Education for the 21st Century**

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Abstract: In public schools, all around the world, we are exposed to the emergence of projects that aim to promote students' success, valuing their interests, motivations and potentialities, regardless of their physical, intellectual, cultural or other condition. This study analyzed the project "Edulabs", implemented in Portugal in 2014, by the Ministry of Education. "Edulabs", as defined by the Ministry of Education, are classrooms with integrated technological systems of hardware, software and educational platforms, intended to be the core of the schooling ecosystem, focusing on mainly on teaching and learning. Using it is easy, attractive and mobilizing. The objectives of this project are to improve the pedagogical work and the use of technology, which in turn will have an impact on the quality of teaching and learning. We analyzed a group of the fifth-year students, as subjects of this project, to understand how they use technology and the teaching and learning methodologies available to them, and what results come from such use.

Key words: competences for the 21st century, school for all, pedagogical innovation, "Edulabs" project

# **1. Introduction**

The Edulabs Project derives from the E-Escolinha program that made the Magalhães computer available, in 2008, for the students between first and fourth grade; creating conditions for the development of innovative work dynamics.

This project was implemented in Portugal in 2014, and presents itself as an innovative and attractive educational tool for classroom use. The ambition to develop a work of continuous improvement of classroom dynamics and to improve the quality of teaching and learning, through the creation of a school ecosystem focused on the teaching and learning component, requires reflection and monitoring, giving an essential importance to direct observation in context.

Thus, in order to better understand the Edulabs Project, we observed a group of the 5th year of schooling in a public school, in the context of the classroom and studied how learning is processed using technological systems, in this case — by using a tablet device.

The aim is to understand how classrooms are organized, what the role of the student and the teacher is in the learning process, and how to personalize the teaching-learning process, in a perspective of inclusion. It is also intended to understand how the use of the tablet promotes the development of key skills of the profile of the XXI century student.

During the year 2017, the Ministry of Education in Portugal prepared a document "Profile of the student of

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the XXI century", where it sought to establish the areas of development and acquisition of the key competences that should be reached at the end of the 12 years of compulsory schooling.

According to these competences, the aim is to promote the student empowered using dynamic educational experiences in order to promote sociability, resilience, communication, autonomy, problem solving and all the skills that allow the construction of an individual more capable of overcoming the challenges that will arise throughout their life. The purpose will be to prepare them for life in society, with all the successes and failures they must face.

Innovation has emerged as a frequent term in our discourse, but with a multidimensional sense. According to the OECD/CERI report, educational innovation is "a dynamic change aimed at adding value to an educational process, which leads to measurable results, both in terms of sponsor satisfaction and in terms of educational outcomes" (Kampylis, Bocconi & Punie, 2012, p. 7).

Jonassen (2007) points out that ICTs should be understood as cognitive tools since students learn with technologies and not through technologies. However, in order to promote active learning for students it is necessary to create the right conditions by using different tools and integrating these new experiences of learning in their lives. Thus, ICT must be integrated, when the authenticity of learning is intentional, as a tool to solve real problems.

Studies conducted by the OECD and UNESCO show that the use of technologies can also ease knowledge acquisition, allowing students to have greater access to information. They also consider that computers were particularly effective when used to extend study time and practice, and their use allows students to take control over the learning situation such as, when used to support collaborative learning. However, the study also notes that its exclusive use can affect students' reading ability, cautioning that by itself its use does not guarantee success in all areas.

As the power and functionality of mobile technologies continue to grow, their usefulness as an educational tool is likely to broaden and along with it, its central role in both formal and informal education (UNESCO, 2013, p. 42).

The Edulabs Project brings an innovative digital tool to the classroom, the tablet and all the applications that are part of it make up a resource that breaks the learning dynamics presented by traditional teaching, since it favors changes in the level of classroom organization, nature of tasks, resource management, and classroom dynamics.

This project was presented by the DGE in 2014 to about 20 schools nationwide and has been continuously adjusted to fit the reality is lived in the School today, adapting to the profile of the student that we have in our schools. In this school, the group that is implementing the Edulabs project is organized in small working groups. In this way, direct interaction between group members is shared, sharing opinions and promoting collaborative work.

#### 2. Methodological Framework

The current research is part of a methodological approach derived from both a qualitative and a quantitative nature. In this study, the method of naturalistic observation was used along with the method of the semi structured interview and the field notes resulting from informal conversations within the school context.

Three teachers from the 5th grade class were interviewed: the class leader, the ICT coordinator and the

Portuguese teacher, and the group's sub-director and the Co-Lab coordinator at the school. Observations of classes and projects developed by the study group were also conducted: three observations of classes in History, Mathematics, and English, and in addition, a field observation in the Natural Sciences course. It should be noted that there is a direct relationship with the educational context since it allows greater access to information, as well as an ease in identifying the objectives of the study, according to the target context's characterization.

In addition, a collection of data from various documents was made, allowing the interchange of information, leading to conclusions. Based on this research, a more detailed characterization of the target context's constitution, and the mission and objectives that it defined, was carried out.

According to the Educational Project (PE) of the school, we could verify that the Study Group was created in July 2009, on the south bank of Lisbon, to respond to the growing need of increasing the access to pre-school and basic education in this community. The community consists of 4 schools and has approximately 1300 students.

The school's population consists mostly of students with Portuguese nationality (94.6%). The remaining students come from various different backgrounds, of which we place emphasis on Brazil (1.7%) and the Eastern countries (1.8%). Together these represent more than 60 students in the grouping and are an important reference for the heterogeneity of the school population, which implies the allocation of resources, namely social support (31.4% of students have support from School Social Action).

#### **3. Results Presentation**

Through this research, we have tried to understand how this project improves the pedagogical work and the use of technologies, and how it affects the quality of learning. Thus, it was our priority during this research to identify the strategies implemented by teachers in the classroom setting, namely–to what extent the difference is welcomed as a value added, according to the perspective of inclusion. In addition, the impact of these strategies on the success rate of these students was also analyzed. It is intended to suggest indicators of success that favor the validation of these strategies and associated technological resources.

The Edulabs Project, as we could verify in the interviews carried out, appeared in the grouping at the request of a first-grade teacher three years ago and was applied in a heterogeneous 2nd grade class. Over the past three years, the project has undergone some adjustments, notably in classroom planning, seeking to improve collaborative work among students.

Thus, the data points to an existing willingness on the part of the management body, to welcome projects that are considered to promote success, valuing teachers' suggestions of who are predisposed to change.

## 4. The 5th Grade Class

The class director was composed of 16 boys, 6 girls, and 3 students with special educational needs (SEN), however they are students with a very high level of energy, and according to the teacher, this means that "the students cannot remain stationary, although they are helpful, they need to be busy, and the lectures do not work in this educational context. On the other hand, individual tasks such as work sheets are also challenging for these students. They are students who need a context and a meaning for their learning, questioning a lot what they have to do, and the use of what they are going to do".

# 5. The Opinion of the Teachers about the Development of the Project

According to the Portuguese teacher, the devices that students prefer to use are digital. Students receive one tablet given by the school at no cost and in turn these devices must be returned at the end of the year.

As for the dynamics in the classroom, it was also mentioned by the Portuguese teachers that there is collaborative work and there is a sense rooted in the students regarding helping each other: "some end up faster than others, and they love the process of choosing those who help and those who need help as some give explanations to others".

As the lesson progresses: "they work together, talk and discuss. We can see sharing of knowledge and points of view". This data points to a natural predisposition for collaborative work, since they naturally identify the right moment and the tasks that best suit the beginning of partnerships and collaboration. On the other hand, it is understood that the teacher gives autonomy to the students for a shared management of the classroom, being able to show confidence in the work developed by the students and in their capacities for collaborative work. Regarding the resources used, he said: "We frequently use the mail app, the platform OFFICE 365, and the 'sapo campus' which is the equivalent of Facebook for the school in order to share documents and communicate".

In another interview with the Mathematics teacher, they stated that "a teacher who promotes collaborative learning cannot remain behind a desk, they must observe and be involved, they must perceive how the students think, if they can follow what has been disclosed". In this sense, students learn in the most effective way with sharing and debating information with each other: "they can share their opinions, presenting to each other's their arguments. It's very interesting". This type of learning embraces all students; it also naturally implements collaborative procedures that respect the learning patterns of each student and allows for inclusion in the true sense of the word. In addition, one can perceive that the teacher's motivation and interest, when implementing such strategies, has an impact on the classroom environment.

On the other hand, with the data collected from field work, it was possible to verify that in several moments, the projects developed sometimes noisily, but productive. In a classroom environment and by giving students autonomy for the development of tasks, we noticed that the noise can be favorable for skill-development. However, according to the ICT coordinator at the school: "it is from work group voices that opinions are born, and projects are carried out". Thus, the data points to the identification of some elements that may characterize a collaborative working context, with noise being considered as one of these elements.

#### 6. What the Quantitative Data Tell Us

We used the quantitative analysis method to understand if this project enhances school success. The E-Class Project comes under the "Tutoring Program" measure of the group's Strategic Action Plan (PAE), and consists of the group's overall responsibility for the school's results, activities developed by the class as part of the school's annual activity plan, responsible use of resources made available by the school and behavior through a quarterly ranking system that awards the best classes. This project contributes to the following objectives:

- to prevent situations of indiscipline, lack of punctuality, attendance abandonment and early departure;
- promote autonomy and organization in students;
- improve success;
- promote cooperative work and in turn improving behavior.

## 7. The Data Collection for the E-class Project

From the results obtained with the E-class Project, it was possible to conclude that the two classes where the "Edulabs Project" was implemented had the best results. Through the quantitative analysis method and the examination of the grades obtained by the students at the end of the 1st period, one can realize that the use of technologies has a significant improvement of the students' school results, both at the level of internal evaluations and at the level of their predisposition for challenges involving student collaboration and competitiveness.

Facing the implementation of innovative methodologies are the students who acquire competences that make them more willing to participate, and to be critical and cooperative in the management of their own learning.

By implementing the innovative methodologies implemented by the Edulabs project, this study aims to promote the success of all students at various levels, by:

- promoting a greater motivation for the use of technologies (Tablet);

- Promoting rapid access to information;
- Contributing to collaborative work among students;
- Allowing for an easy, attractive and mobilizing application;

- Providing the intrinsic knowledge of each student, bringing the experience of each individual student to the classroom;

- Promoting help between students/support students give their colleagues;
- Respecting each student's working pace making the inclusion of every student possible;
- Promoting pedagogical differentiation so that all students can learn at their own pace;
- Streamlining different tools and thus forcing the student to make decisions;
- Developing a personal point of view;
- Make the student constructor of your learning;

Taking into account the data presented on the potential and the implications of ICT in the teaching/learning process, this study shows that there is a need for proper integration and use in an educational context (formal and/ or non-formal spaces), of educational tools and resources capable of providing new and different approaches, that result in more motivating, engaging, and potentially meaningful learning. The use of technology in this study breaks away methods, beliefs and attitudes of traditional schooling system, and challenges school with pedagogical innovation in order to change and transform the school.

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