The use of ICTs in teaching and learning processes

Nuno de Almeida Alves (CIES-ISCTE)
Ana Nunes de Almeida (ICS-UL)
Ana Delicado (ICS-UL)
Tiago Carvalho (ICS-UL)
The Portuguese Education System (Compulsory and Secondary) is undergoing a massive technological transformation process:

- broadband networks are being deployed in schools all over the country;
- computers and white boards are being installed in the classrooms;
- laptops and internet connections are being sold to students and teachers at below the market prices.

- However, the integration of ICTs in compulsory and secondary education curricula is progressing very slowly;
- A clear-cut strategy (of integration of ICTs in education) also seems to be lacking.
Methodology

The data presented in this paper comes from an ongoing research project concerning children and the internet in Portugal (2008-2010), carried out at ICS-UL, funded by Gulbenkian Foundation

Research team: Ana Nunes de Almeida (Coordinator), Ana Delicado, Nuno de Almeida Alves, Tiago Carvalho

Quantitative and qualitative data was collected:

• Survey of 3049 children between 8 and 17 years old (4th, 6th, and 9th grades of compulsory education)
• Interviews with 50 children
Profiling Portuguese “digital natives”: Access and training

• 91 percent have a computer at home;
• 78 percent have internet connection at home;

• 35 percent claim they have learned to use the internet by themselves
• 34 percent with their parents
• 17 percent with their friends
• 13 percent learned at school
Profiling Portuguese “digital natives”

In broad terms, it might be said that children are competent and confident internet users, although with the expected inequalities imposed by age, educational background and social class.
Profiling Portuguese “digital natives”

### Dimension 1
**Digital skills and intensity of use**

<table>
<thead>
<tr>
<th>Negative</th>
<th>Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amateurs, Intermediate</td>
<td>Professionals, Experts</td>
</tr>
<tr>
<td>Incipient users, diligent students, committed gamers</td>
<td>All-round cybernauts</td>
</tr>
<tr>
<td>Non-users</td>
<td>Users</td>
</tr>
<tr>
<td>1-3; 4-7</td>
<td>8-10; 11-15</td>
</tr>
<tr>
<td>Less than 1 year; between 1 and 2 years</td>
<td>Between 3 and 4 years; 5 years or more</td>
</tr>
<tr>
<td>0-3; 4-6</td>
<td>7-8</td>
</tr>
</tbody>
</table>

### Dimension 2
**Parental Mediation**

<table>
<thead>
<tr>
<th>Negative</th>
<th>Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Alone, with friends</td>
<td>Family, School, course</td>
</tr>
<tr>
<td>Autonomous, hesitant</td>
<td>Suggested, cumulative</td>
</tr>
<tr>
<td>Peers, no communication</td>
<td>Peers and family</td>
</tr>
</tbody>
</table>
Profiling Portuguese “digital natives”

Dimension 1 - Digital skills and intensity of use

Dimension 2 - Parental Mediation

- Unguided rookies
- Nurtured beginners
- Self-reliant cybernauts
- Nurtured cybernauts

- Rules on internet use
- Years of internet use
- Learned to use the internet
- Computer skills
- Communication
- Media environment and other resources
- Online Social Networks use
- Typology of young internet users

Online Social Networks use
Media environment and other resources
Navigation strategies
Computer skills
Communication
Years of internet use
Learned to use the internet
Rules on internet use
Typology of young internet users

ICT use at School

Frequency of use in the classroom:
Everyday or almost everyday, 13 percent
Sometimes, 60 percent
Never, 27 percent

Frequency of use outside the classroom:
Everyday or almost everyday, 33 percent
Sometimes, 33 percent
Never, 34 percent
ICT use at School

Schools seem to be very unevenly equipped with ICT: in some schools computers are concentrated in ICT Labs or School Libraries, in others computers seem to be scattered around the school area.

“There are computers in the ICT Lab, in the classrooms (one computer in each classroom) and in the School Library” (Private School, 9th Grade)

“We have computers and the internet in the School Library, but if we bring our computers to the school we have wireless access.” (State School, 6th Grade)

“In my classroom, in every classroom (...) in our classroom we have two computers” (State School, 4th Grade)

“Sometimes we bring our computer from home. The school also has laptops that we can take to the classroom. Sometimes, when we are dealing with a research project we take the laptops to the study classroom/school library to research on that subject.” (State School, 9th Grade)
School subjects where ICT is used in the classroom

Transversal subjects (ICT and “Project Area”), 54 percent
Traditional subjects, 21 percent
Both, 2 percent
Do not use, 23 percent

These numbers are significantly enlightened when crossed by school grades:
• Non-users are fundamentally 4th graders.
• ICT use in the traditional subjects is a specific feature of 4th and 6th curricula.
• ICT use in transversal subjects is dominant in the 9th grade, where research and dissemination activities on socially relevant issues are initiated.
School subjects where ICT is used in the classroom

“We use computers and the internet in “Project Area”. We search for information on the subject that we are dealing with (...) drugs, bullying (...) we also use them in the ICT subject” (State School, 9th Grade)

“We are now finishing a group essay with PowerPoint. First we worked with Word and then with PowerPoint. We search on the internet [Google] and the professor was watching (...) We can’t “copy and paste” texts that we find online...” (Private School, 9th Grade)

“we were learning the song in English. We went to YouTube, we wrote Rudolf [the reindeer] and the music starts to play...” (State School, 4th Grade)
Finding a role for ICTs at School

• There seems to be no clear, recognizable national strategy for the integration of ICT within the school curricula and pedagogical activities. It probably depends more on the school leadership and dynamism and enthusiasm of teachers.

• Schools seem unevenly equipped. A minimum set of resources should be defined in order to prevent flagrant inequalities.

• The available formative offer (learning how to use different kinds of software) is probably reproducing the competencies students have already acquired in other contexts, namely at home. However, it may have a corrective capacity concerning students without access to ICT.
Finding a role for ICTs at School

• The use of ICT in teaching and learning processes has been successfully implemented in transversal subjects like ICT and “Project Area”.

• On the opposite, the application of information technologies to teaching and learning Mathematics, Languages or History has been clearly less successful, without a clear justification.

  • Lack of confidence /competences of teachers;
  • Scarcity of pedagogical content and software;
  • Formal opposition by teachers to use pedagogical tools that they weren’t initially trained to use in a professional way