

Shifts and developments in digital Education and Teaching

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Introduction

For more than 30 years, we are speaking about Computers and Technologies in Education, we organize and attend conferences about Education and Technologies, we write and read lots of books and papers about this topic. Where are we now? What has changed? Did we progress? Did we answer the main questions? What is still unsolved?

From computers to new technologies, ICT and digital technologies

The wording has evolved: In the eighties, we were talking about “Computers in Education”. Then we started talking about “New technologies in Education”. Then came the time of “Information and Communication Technologies (ICT) in Education”. And now, we prefer talking about “Digital technologies”. This is linked to the evolution of the technology.

During the first period of time, computers were non-connected computing machines. In Education, they were used for calculating and programming. At that time mathematics was the main domain of applications of Computers in Education. Then Technologies did not reduce to computers only; other devices started being linked with computers. Pocket calculators started to be used in schools. So we preferred to speak about “new technologies”.

But the main change came when Information Technologies (information processing) and Communication Technologies (information transporting) started merging. It was a kind of revolution in the technology. Computers were suddenly connected to each other, computers, telephones, cameras, etc. started to merge into multi-functions devices. Networks started to develop; the Internet was created and made available for everybody. For many years, we spoke about “ICT in Education”.

But now, we more and more prefer to speak about “Digital” devices and resources. This seems to stress that what is important is not technology, but the fact that information is digitalized and that this develops a new culture, based on digital concepts: digital technologies, digital resources, digital culture, digital environments, digital society.

Core changes in a digital Society: knowledge, professions

Clearly, technology has evolved. But the main changes are not technological. In a “digital society”, knowledge has changed, and all the professions and jobs have changed.

Each subject has changed because of the digital context. But more, knowledge can no longer be described through a series of different subjects. The knowledge needed by professionals and citizens in the XXI century is more complex, more transverse. We are in a society where knowledge has become an economic good, has a value, can be stored, bought, sold. We are in a “Knowledge Society”.

The whole society has been impacted by digital technologies. Each profession has changed; each profession had to integrate the digital technologies and resources. New “knowledge professions” appear.

Why are Education and Schools so reluctant to change?

If the whole society is changing because of digital technologies, why are Education and Schools so reluctant to change? There was a lot of research about ICT and schools, about learning and teaching through ICT, about integration of ICT in Education, but up to now the actual changes in schools are not so clear. There are lots of interesting and innovative experiments, but most of the teachers seem to be “conservative” in terms of digital technologies.

And this is not an individual problem: it is a political question. In all our countries, we had many “plans” for ICT in Education. Some failed, some were successful. Why? Several answers can be imagined:

First, most of the national plans addressed equipment (hardware and connectivity), pedagogical resources, and teacher training. But it was always difficult to articulate and balance these three aspects. Technology and money are not enough for changing Education. It is more a cultural and pedagogical question: The culture of Education has not really changed, the pedagogy stays mostly as it was for years...

School actors often consider digital technologies as “competitors” which will change the classical processes and methods, with a risk of destroying some basic components of education. So they want to resist!

Knowledge is sometimes considered as something stable, “sacred”, which cannot change. This is of course against what digital technologies promote!

The traditional teaching profession cannot remain the same! Digital technologies bring major changes in the profession, in the daily work of teachers. And too often, teachers do not really want to change!

It is not so clear that digital technologies help for a better learning or teaching. Research has to progress a lot in this field! This leads some teachers to preserve traditional learning and teaching.

And a main question has not been solved: Do digital technologies help only the best students, or is it a way for enhancing learning for all pupils, particularly the ones who are in difficulty? Can digital technologies stimulate the will and taste for learning and re-motivate the pupils in difficulty?

The Education systems must be aware that the main aim in integrating digital technologies in Education is not a better learning or teaching, but it is preparing citizens and professionals for a society in which digital concepts play a core role in all aspects of the social and economical life.

How to move?

We have to move from a vision in which digital technologies are just technical tools to support some pedagogical techniques, in which one can use digital techniques without understanding the basic digital concepts, to a vision in which schools are profoundly transformed by digital technologies, in which knowledge is changing, in which the way of learning and teaching is changing, in which digital technologies are the cultural support for the work and knowledge of the XXI century.

Main trends for the future

It is not enough to have good digital national plans for equipment, resources and training. We need to address some more fundamental issues and transform them into concrete actions in our schools and universities.

1. Irrigate Education with digital concepts. A digital society has to integrate profoundly some core concepts which influence the whole society. For instance, what is information? What are data? What is knowledge in a digital age? How can we process information and knowledge? What is a network? What is really the Internet? What is connectivity? What are the new rights and duties in a digital society?
2. Learn and teach in a digital world: Digital pedagogies. The main stake for Education in a digital society is not technology, it is pedagogy. We must innovate with pedagogy, we must develop pedagogies enhancing what technology now permits: Pedagogies adapted to the new generations, pedagogies integrating the new ways of dealing with space and time in a digital world, pedagogies no longer based on paper but on digital environments, pedagogies for mobile learning, social pedagogies using the new social networks possibilities, personalized and individualized pedagogies. MOOCs give a

good example of pedagogical innovations; using the cloud in Education opens new ways for teaching and learning.

3. Teach Informatics. Some countries have already implemented informatics (computer science) as a compulsory subject in schools, some have not. It is now time to really teach the basics of informatics to all pupils, because it is a necessity for all citizens and for all professions: Teach what “computational thinking” is, teach algorithmics and programming, teach data and data processing, teach information processing, teach connexion, teach the Internet and networking. As Douglas Rushkoff said “Program or be programmed”!
4. Develop a “digital culture”. There are debates about digital culture: does it exist? Or is it the digital component of culture? Anyway, Education and schools must move to digital culture, in terms of knowledge sharing, of cooperation for learning, of creativity. This is more a mindset than an object, but this must be considered as a core stake for Education in the digital era.
5. Network the schools. The school can no longer be a closed world. Schools must take part in the global changes: developing partnerships, integrating communication as a way for learning, developing new spaces for learning (co-working spaces, living-labs and fab-labs, etc.); integrating the global networks as complementary spaces for learning.
6. Change the professions of Education. Nothing will happen without the teachers. In a digital society, teachers are necessary; their role cannot be replaced by technology. But they must move from their traditional role to the main missions of their profession. They are no longer the only owners and deliverers of knowledge. But they have a specific and irreplaceable role for managing the relevance of information and knowledge, for knowledge construction, for formal learning, for ensuring a “deep learning”, for socializing the pupils, for developing collective intelligence. The school is the place for interaction between the pupil, the teacher and the knowledge, and this is what learning is!

Conclusion

Education and teaching in a digital society do not only need digital technologies! The main issues are political, cultural and pedagogical. In the past 30 years, we have tried almost everything in terms of technology, resources, teacher training. It is now time to move to more ambitious issues, based on what societies really are in the XXI century.