

Observing the e-Learning phenomenon: The case of school education. Analysing the transformative innovation of e-Learning

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Summary

Over the past 25 years, the school sector has been the promising area for public policies and funding activities, as well as for commercial interests, to increase the availability of ICT in education. From the years when the questions basically addressed the needs of piloting innovations in the learning process, the international discourse about the impact of ICT on the outcomes of school education has gradually taken on a more mature and purposeful approach whereby the necessary changes that characterise interrelations with decision-making in education as well as with out-of-school developments are currently being taken into account. These interrelations have been greatly affected by the ICT penetration of society at large, implying a holistic approach to the evolution in learning at school level as regards the education outcome and its long-term impact on growth and social inclusion.

A lot of public spending took place, in the form of subsidies for the development of end-products or funding of pilot products (mainly off-line) at both the national and the European level. Nevertheless, although there are not any well-documented surveys regarding the returns in terms of quality and effectiveness of learning, it seems that these targeted content applications have been put to use only marginally in school curricula. In the meantime, the changes in digital content (business) models, brought about by the continuous enhancement of Internet-based services, which are revolutionising the content services markets, are further undermining the traditional paradigm of knowledge building at school (from a straightforward “push” to a blended “push-pull-push” model). This means that the availability of hardware (infrastructure) and the (sometimes) abundance of textbook-like digital content (the fallacy of “new” textbooks in the electronic era) do not appear to be sufficient to cater for advanced, enriched and innovative learning experiences, thus marginalising any returns on investments.

We have hereby considered three strategic evolution dimensions: that related to the decision-making processes (running of schools), that related to the accessibility level in relation to the achievement of a standard quality and, finally, the emerging inter-winning fields of professional teacher development and the value chain of content (knowledge) as it cuts across the traditional fragmentation between the “creator” and the “consumer” of “knowledge”.

Keywords: Schools, innovation

1. School Education: the territory and social priorities

The term *School Education* refers to any form of learning that takes place at the age between 4-6 years and 17-19 years old. According to the dominant paradigm in the last century (20th), in all developed societies, any type of learning offer, covering subjects and programs, curricula and textbooks, or learning setting, basically school-based, including those from age to subject-structured school classes and project teams - or even those taking the form of home-based learning ('home schooling') -, all these are to much extent prescribed, regulated and more often directed by the country/region education authorities, in the form of national or sometimes local curricula as well as through the established practice of teaching ("patrimony") in the relevant school system.

There has already been a lot of research on the introduction, use and the potential impact of the Information and Communication Technology (ICT) on learning which takes place or is related to schooling, from the Primary to the last grades of the Secondary Education (Upper Secondary). During the last 20-25 years, starting from the early '80s, computers and later on networking and communication technologies have continuously - and in waves - been installed in schools, following their widespread adoption and penetration in almost all other social contexts. These installed ICT resources are being characterized by widely varying usage rates and even more varying returns, in terms of both the quality of the learning process as well as the learning achievements and the education attainment.

Evidently, in these 25 years, the school sector has been the promising area for public policies and funding activities as well as for those commercial interests aiming at increasing the availability - and hopefully use - of ICT in education at large. Moving from those early years on, when the research questions were basically addressing the needs of piloting and validation of innovations in the micro-setting, the learning process, as it happened with the CAL (Computer Aided Learning) and other similar initiatives, at present the international discourse about the rationale of the introduction, use and, eventually, the impact of ICT on the outcomes of school education, has gradually reached a more mature and purposeful approach. Whereby, the necessary changes which characterize the interrelations with the operational aspects and decision-making in education as well as with the outside-school developments, in the content services and entertainment (the "home market"), are currently being taken into account more systematically.

These interrelations, between the micro-level, the learning process - sometimes described by the term "school practice" - and the macro-level, when referring to policies and action planning for the running of the school system (education policy), have been greatly affected by the ICT penetration in the society at large. Thus, implying or better asking for a holistic approach to the analysis and understanding of the evolutions in learning at school level, the changes in terms of the education "outcome" and their long-term impact on growth and social inclusion (the social and individual values, the new 'balance' between the public and private sphere, the social mobility etc.).

2. Emerging Trends and Developments

The types of institutions defined by or using the term *School* does not vary a lot, at least in the European Union area. The term is used when referring to the pre-tertiary education establishments, which are either Primary (and nursery) schools or Secondary schools (Lower Secondary, ages 13-15 yrs and Upper Secondary, ages 16-18/19 years). All of them are in most cases run by the state or by other forms of socially accountable entities, like the municipalities or local educational authorities. The private sector has a rather marginal existence in some EU countries, mainly for purpose or target specific schools (like faith schools, etc.). Greece corresponds to an exception, as the system although dominated by the public school sector allows for the existence of tightly regulated private (in fact profit making!) entities offering school education (i.e. they own and run schools).

The applications of e-learning in School Education can take several forms, ranging from the activities enabled through ICT, conducted into the classroom, to those at a distance (e.g. e-homework). Or, even more, from those activities addressing the teachers to the others engaging the pupils and, from national programmes to grassroots initiatives, involving only one school class and, finally, to virtual mobility programmes of school teachers and pupils.

The advancements of ICT have usually been transferred to basically only technical enhancements in ICT-for-learning (e-learning) infrastructures in schools, thus constituting the *driving concern of waves of public spending, in order to support widely accepted policies that were to sustain the availability of computers and, later on, of networking in the European schools and the school classrooms*. The so-called *infrastructure availability and access* has always been the major - in fact in most of the times the only - concern of all governments and the EU itself, in the context of the Lisbon Process (and the *Education and Training 2010 Objectives*). As regards particularly this policy priority, some countries, like the ones of Southern Europe, had to go a long way in order to bring their gap towards the Nordic countries and the UK into a reasonable range (see references about the latest figures, for the year 2002-3).

Nevertheless, relevant progress in this area, as measured nowadays with the “famous” *pupils-per-networked-computer* ratio, seems not to be enough, in order to facilitate the foreseen changes in schools (upgrade of the quality of the learning process and the outcome). To this ‘under-performance’ we should also add the still problematic objective of sustaining a quantity and quality threshold of *access to ICT resources*, which turns to be a rather expensive exercise for the public authorities - for the maintenance cost as well as the hw and sw upgrades.

Apart from the main objective (“pillar”) of the *infrastructure availability* - which is actually only partly defining the *accessibility level* (the *access to learning resources*) -, most of the self-respected *education policies in EU member states addressing the school sector in the last 15 years, have dealt with the “digital learning content availability”, usually subsidising the cost (“paying for”) the development and piloting of so-called “educational” software*. It used to be and still is, at least for some of them, another demanding and controversial area of intervention and expanding policy making.

There has been a lot of public spending in the form of either subsidies to the development cost of end-products (in the eligibility margins of the competition regulatory framework) or in the form of funding of pilot products (mainly off-line), under research and development support frameworks, at both the national and the European level. The driving objective being always the facilitation of a rich and expanding “pool” of quality digital learning materials, in order to provide the school communities with more demanding than “drill and practice” software with really engaging multimedia titles, using cultural and scientific content of high value from across Europe! Nevertheless, although there are not any well-documented surveys as of the returns, in terms of quality and effectiveness of learning, it seems that these targeted content applications have only found a rather marginal use in the school curricula.

In the meantime, the changes in the digital content development and publishing (business) models, brought about by the continuous enhancement of the Internet-based services, which takes place in the last 10 years and is still revolutionizing the content services markets, are further undermining the traditional paradigm of knowledge building in the school (from a straight “push” to a blended “push-pull-push” model). Meaning that, the whichever availability of hardware (infrastructure) and the (sometimes) abundance of textbook-like digital content (the fallacy of the “new” text-books in the “electronic era”) do not seem enough to cater for advanced, enriched and innovative learning experiences, thus marginalizing the returns of the relevant investments.

A common mantra as regards the rational approach to policy-making and design for the introduction of ICT-driven innovations in the school system used to go about focusing on all the three lines (areas) of potential action, namely *infrastructure* (“equipment”), *learning materials* (“content”) and *teachers preparation* (training, the “human factor”). And, going even

further, including recommendations as regards the split of the available resources, with the “golden rule” of allocating a third to each action line! This is leading us to ***the most problematic policy area as regards the ICT-for-learning in School Education, which is related to the “human factor”, the school teachers.***

Although teachers have historically been considered the critical factor for the success of any type of innovation in education, it seems that both the scale and the potential effect of the ICT-driven changes in school education go beyond the capacity of the education system. Which has to sustain an ever increasing level of quantity and quality of the “teacher” factor (the “teaching capacity”), considered enough to address the continuous increase of the demand for learning in our societies. The school education systems, with different reasons to look for in the developed and the developing parts of the world, are facing an intensifying problem of relative decrease of teachers professional development capacity, which constitutes a challenge of the 21st century societies, when considering the impact on the provision of school education and the effects on the social inclusion policies as well as on the productivity and the economic growth.

In most of the widely acknowledged papers and research work, the impact of ICT on the learning processes implies significant changes of the role (job) of the teacher, asking for increased capacity for strategic thinking, motivation and leadership and collaborative-communication potential, in order to provide mentoring in new forms of learning experiences for her/his students. In this evolutionary context, how could we define “good practice”, in order to serve a bottom-up approach to the consolidation of new school learning paradigms and, at the same time, to constitute an effective approach to holistic policy-making, in order to reach the right balance with top-down planning, meeting the challenges of “access to learning” (see “infrastructure-equipment”), “creation and sharing of knowledge” (see “learning materials”) and “building of competences in learning communities” (see teachers training and professional development)?

In the following, we come to foster the critical components of successful (effective) policy making and flourishing practice, through the reference to certain cases of innovative and sometimes successful policies and projects, from across Europe. We tried to point to government initiatives or even school-driven projects, which have either been completed successfully or they provide evidence of a long-term impact on future evolutions in the school system (e.g. the change of the role of the teacher, the consolidation of new service delivery schemes to schools, etc.)

3. Observing the Change: Is Innovation taking place?

We have considered ***three critical, strategic dimensions which should be brought to the attention of both education analysts (researchers) and policy makers.*** We start with what has to do with the *decision-making processes and the running of schools*, then we proceed with the dimension of the *accessibility level in relation to the attainment of a standard quality* (as regards “access”) and, finally, the dimension that defines the *emerging inter-winning fields of teacher professional development and the value chain of content (“knowledge”)*, as it cuts across the traditional fragmentation between the “creator” and the “consumer” of the “knowledge”.

▪ ***The competitive advantage of the autonomy at school or local level***

From the extended review of the ICT-for-learning policies and activities in the EU, it seems that those countries that are running a rather decentralized school system, whereby autonomy in decision-making concerning the curriculum, school program, equipping, etc., is high, as it is in the case of the Nordic countries, the UK and the Netherlands, show a comparative progress. This progress has to do with an increased and more demanding use of ICT in the learning process. In the HELIOS Comparative Analysis Report (an Observatory Action run by the MENON Network, www.menon.org), these countries usually correspond to

the “*champions*” of *e-Learning* and, as in most of the cases, they provide a policy-making practice that goes with a systematic evaluation work, accompanying any type of action and introduction of innovation. What is also very interesting, in these school systems, as documented by the PISA results, only a small part of the variation of the testing performance among the students can be attributed to the difference between the schools!

▪ **How to go with investing in infrastructure and services to schools**

It has already been mentioned that the success of those policies that aim at providing the necessary computing and communication infrastructure to schools is very much dependent on the extent to which they are integrated in a much broader and more holistic approach to education objectives, an approach which actually copes with the principle of *accessibility* or, in other words, the sustainability of a *minimum “access level”* to the ICT resources. This sustainability comes as the result of (a) the availability of funding to ensure a certain maintenance level for both hw and sw and (b) of the capacity of spatial and time-wise arrangements as well as the competence of the school staff to ensure significant use of ICT resources by the students.

▪ **Joint actions for online learning materials and teacher professional development**

Many studies and surveys - and the widely accepted understanding of education analysts - suggest that the most critical evolution of the school system has to do with the changes related to the role/job of the teacher. Everybody is convinced that we need to cater for a more demanding job, which will ask for high-end competences related to knowledge and skills acquisition and cognitive procedures as well as to the communication and project management. This also implies a strong linkage to the emerging knowledge building schemes, whereby information - i.e. content - with potential and varying learning value (sometimes named “learning materials”) is being developed, shared, used and re-purposed dynamically, especially through communities of common interests - see the parallel of project/subject or age-defined classrooms in the schools. It is promising for their education systems to mention that in both France and Germany, with still rather centralised and authoritative school systems, interesting policy cases have been identified. The cases point to the inter-winning of teacher professional development and the learning content and knowledge building in schools.

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