

## **ICT and the classroom: from the transmission to sharing and from performance to interaction**

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### **Abstract**

We have completed the second decade of the new millennium. Furthermore, we have experienced a pandemic and the accelerating effect it has had on the use of digital and basic distance learning mechanisms. The changes caused by digital, by the intensive use of individual mediation forms, such as those made possible by digital devices, have made the tension towards traditional teaching and learning environments even more intense. Thus, the classroom space has become small: insufficient for society's needs, tiny for those who teach, and insignificant for those who learn.

Digital has brought new forms of time and space that we need to explore and greater urgency in dealing with the group and cooperation between individuals as basic dimensions to prepare for a reality where creativity and innovation are required values.

A brief reflection on the scope and possibility of technologies is proposed here to serve teaching and learning space more aligned with our time's needs, taking the classroom as a starting point.

### **1. Introduction**

Information and Communication Technologies (ICT) has been the driving force behind increasing digitalization and, in its function, increasingly sophisticated automation. In this context, human-made artifacts are being made more evolved and autonomous and are often constituted as mediators and even substitutes for human beings in their functions and, in more advanced cases, even in achievements.

This ambition level has raised a question about the class's role and its limitations since it corresponds to a record of the same time and the same space, still the same subject. This alignment between time, space, and subject is increasingly being questioned, given the diversity and demands placed upon individuals and groups of individuals.

The promises of digital were precisely those of offering a new asynchronous time and a new remote space that, combined with the previous options, create alternatives, in many cases more efficient, for interaction, even in the context of teaching and learning. In this context, we face a challenge in which digital platforms transform the classroom's role as there is significant pressure to abandon teaching and learning practices. Those practices are based on external regulations and oriented on the supply side, while instead of meeting the demand and thus perceiving a learning context, more diverse and plural and based on a transformation of the transmission of knowledge for sharing and the concerns of individual performance evaluation, for a peer evaluation, sustained in interaction.

This brief essay proposes an initial reflection in defense of the classroom and its transformation through new strategies associated with teaching and learning, taking into account the digital as an element of mediation.

## **2. Know-how, knowledge, and technology**

We are experiencing a time of haste, in which information flows with more incredible speed and in more significant quantities than it is possible to deal with, either the individual or groups, even in possession of considerable resources. This context has an impact on what makes us experts and even more on knowledge creation. Perhaps this explains a greater appetite for procedural knowledge or know-how, expressions used to describe practical knowledge about how to do something - a recipe, a practice, or an algorithm, as it is so often referred to today.

The here and now of the need for learning, even in the context of increasing digital sophistication (which accelerates time and shrinks space), provides reactions of individualization of teaching and learning and self-learning practices. Perhaps two compelling examples are: in the Star Trek series, with the Learning Islands ("Vulcan Learning Center" in which in an immersive space, it is "loaded" in the mind of the learner, knowledge, through cognitive stimuli and quickly - an individualized transformation of the classroom, emotionally based); and, more realistically, in the context of the virtual world of Second Life, with numerous examples of spaces for sharing and collaboration for learning (a collective transformation of the classroom, socially based).

These are just two of the many examples of proposals, fictionalized or put into practice and tried, proposed in recent years. These proposals also result from the common perception that the classroom has to be reinvented and that the way to do it is not easy and will require, in addition to mobilization, innovation. We know that there is a need to educate for a different world. The emergence of digital culture with new and transformed skills is gradually being imposed. Examples of this are studies such as DIGICOMP within the European Union, at the OECD or the FEM - World Economic Forum, to name a few examples.

Prepare individuals for a context where digital access; digital commerce; digital communication; digital literacy; digital ethics; a legal framework, also digital; the existence of digital rights and responsibilities; the need for digital health and well-being and, last but not least, digital security is demanding and a requirement for us to function in society. This presupposes digital citizenship that has to be framed in the classroom context. The risk is the classroom ceasing to be seen as a space of preparation for today's society's construction (and for the near future, at least immediately).

In this context, ICT provides a way to help discover a classroom that also promotes digital citizenship. TIC can facilitate access, reduce costs, create opportunities and assist in skills training. Besides, knowledge is implicit in the technology itself. We are faced with the irony of what technology will be needed to reinvent teaching and learning and the lacking the knowledge to do so: procedural knowledge and knowledge about what (besides how). The aftermath societal context, resulting from Covid19 will provide an opportunity to reinvent and reconsider some of the current practices.

### **3. Challenges facing classroom teaching and learning**

The double face of teaching and learning is a good starting point because it makes it possible to involve those who learn and those who teach as partners in the teaching and learning process in a relationship that is different from the existing one. In a context in which the time scale is no longer only human, and the opportunities for mobility and communication are multiple (read different), the one who learns the most is the one who teaches and, in this context, everyone must learn and teach, promoting strategies that are aligned with this reality.

At the outset, a more practical sense for the use of knowledge (as defended by Gilles Lipovetsky), whose work criticizes our society for its individualistic inclination and for having become a space of seduction, not authentic. However, it is precisely to respond to this situation that the author of this essay argues that the classroom should constitute a space/time for ideas and collaboration between all, providing collaborative learning and all learning. Ultimately, this will be an ideal position, but it supports the construction process and guides the discussion. We must learn what we need, retain what we learn and apply, what we learn - thus constituting a rationale of utility that can be perceived by the learner (a challenge in today's classrooms, where the perception of the usefulness of classroom presence is increasingly diffuse).

Already in his work *The Shock of the Future* of 1970 by Alvin Toffler, curiously a book about change, its author argues that "the illiterate of the future will not be those who cannot read or write, but those who are unable to learn, unlearn and relearn". In this context and networks, cooperation, and communities that the classroom has to find its space for survival, as a place to build digital citizenship and space for collaborative teaching and learning.

### **4. The example of the inverted classroom (flipped classroom)**

Moreover, when do we learn? How to provide teaching and learning opportunities favored by technology in the classroom? On the one hand, there are proposals such as MOOC (Massive Open Online Course), the use of Serious Games, Simulation, three-dimensional and interactive content, Robotics and interactive mechanisms, and visualization in an information environment that provide us with a potential for innovation and significant disruption to the classroom. On the other hand, the legacy and installed capacity and the (still) need to consider the school as a central institution of our society, make the classroom still a privileged space for teaching and learning processes.

In addition to being able to explore the previous proposals, it constitutes a space of safety in which the conditions to focus on learning that considers:

A context with reduced cognitive load: using micro classes, videos; short stories, and an emotional connection;

- Allowing a trial and error environment: experimenting and doing it in a safe and supported way;

- Providing time between contents and concepts: facilitating their discussion and framing, in addition to the effort that requires time and attention (focus);
- Making concepts tangible, with content: producing knowledge through reading, perhaps returning the value of the book that seems to be rediscovered in years to come;
- Creating visual stimuli: using multimedia and integrating the fascination of audiovisual and interactive media, increasingly powerful and present;
- It provides diversity by stimulating curiosity and "seeing and hearing" the different, stimulating a digital culture with a critical capacity and tolerance for diversity.

How to stimulate these types of approaches in the classroom? The use of active methodologies is a way to innovate in the classroom. By placing the learner in a context in which he is also a producer of his "own" learning, he provides opportunities to explore knowledge and relate to his peers, also using his skills and digital culture, integrating this into the processes of teaching and learning (something that has been a recurring challenge in recent years).

An example of an active methodology is the flipped classroom in which the student is expected to explore the contents in time before their joint discussion. Thus, in the classroom, space is for discussion and deepening and not for transmitting knowledge. There is an emergence of proposals for the adoption of inverted classroom practices, sometimes through the systematization of adoption and practice models, such as the one proposed by Sargo, Gouveia, and Reis (2020), sometimes involving mobile devices in the classroom to integrate the times of individual and collective learning (Martins and Gouveia, 2020).

## **5. Final remarks**

The limits of information and communication technologies taking the teaching and learning context are smaller and less recognizable. In this context, it is argued that technology is reductive and supported that ICTs are considered an instrument and not an end in itself. A vision centered on technology imposes its "own" cycles associated with an investment, learning how to use and operate it, maintaining and amortizing costs, and then imposing, itself, the cost of change and new adaptation. This technology cycle first often leads to the establishment of an anchor to which we are stuck to our "own" competence park - not to forget that change is the new normal and that diversity is the promotion of this new normal - therefore, with demands for flexibility and agility that does not impose more restrictions than are necessary to the focus of our activity.

Over time, different technologies have emerged that have shaped its practices and have evolved the classroom technology to make it more capable and engaging as a teaching and learning space for the society that promotes it. In this sense, mobile devices and augmented reality seem to be the near future to be taken into account.

Refocusing the activity on those who learn and not on those who teach can constitute the new "normal" classroom. This new normal will be necessary to impact spaces, activities, and teaching and learning strategies. Also, the actors in the classroom assume (or should assume) different roles and create relationship dynamics more associated

with an active role by the part that the learner and must be involved in the teaching and learning process.

In this context, the reconfiguration of the classroom space, more digital and connected, is also a space to promote reading in mixed media (considering physical and digital components) and tangible, embodied by spaces of participation and collaboration that replace the board (black or white), possession and responsibility of the teacher, for collaboration tables and shared spaces, possession of the working groups. Thus, it will be almost certain, the advance of emerging technologies in their “occupation” of the classroom space, namely the use of artificial intelligence means; devices that provide an immersive and transparent experience (including the use of 3D printers and other augmented reality devices); and digital platforms that provide a space for interaction that projects the classroom out of its context and organizes a cohesive memory and space for collaboration.

Whereas the school is training people and the classroom is a space for dialogue, the most powerful technology is people and their training, so the classroom should be a space for discovery where curiosity can be exercised, promoting scientific culture, in the context of a digital culture that provides us with a sustainable future. For the classroom to be that place, it has to follow the times and spaces that today's society uses, inhabits, and explores.

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## Note

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