RESEARCH PATHS BETWEEN UBIQUITY, DISTANCE AND PRESENCE IN DIGITAL LEARNING ENVIRONMENTS AFTER DISTANCE LEARNING EXPERIENCES IN THE COVID EMERGENCY

PERCORSI DI RICERCA TRA UBIQUITÀ, DISTANZA E PRESENZA IN AMBIENTI DI APPRENDIMENTO DIGITALE SUCCESSIVI AD ESPERIENZE DI APPRENDIMENTO A DISTANZA IN EMERGENZA COVID

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Abstract

The inclusive potential of technologies - potential that is not intended to be given as such, but as a result of the synergy between technological tools and methodological systems - has been, in common perception, overturned, affirming a dangerous equation Technologies = Distance, which brings with it the equally dangerous corollary Distance = Exclusion. On the contrary, several experimental paths, well before the lockdown and the massive experiences of Distance Learning during the COVID emergency (DaD), explored the possibility that technologies work, in a methodologically oriented educational framework, from driving to inclusive educational processes and constitute the means to enhance participation in traditional settings and at the same time extend educational settings in extreme contexts of physical or digital isolation

Keywords

Digital learning environments; Distance learning; Ubiquity.

Ambienti di apprendimento digitale; Insegnamento a distanza; Ubiquità.

Introduction

Hybrid Learning Environments represent the opportunity to make the most of the digital competencies acquired during integrated online teaching and can help prevent the dispersion of positive experiences implemented during the COVID-19 pandemic which, otherwise, would go wasted if we were to adopt a reductionist view of a return to the previous status quo. The spatial and emotional dimension, however, seems to be hardly considered in the technological solutions dedicated to the teaching-learning process. In fact, undermining the idea of a common physical place, mobile learning tools have partly blurred the awareness that there is always a "here and now" of the learning individual.

This de-contextualization process, together with the lack of adequate methodological-teaching systems, has produced a paradoxical result in the experience of the recent period. The inclusive potential of technologies - potential that is not intended to be given as such, but as a result of the synergy between technological tools and methodological systems - has been, in common perception, overturned, affirming a dangerous equation Technologies = Distance, which brings with it the equally dangerous corollary Distance = Exclusion. On the contrary, several experimental paths, well before the lockdown and the massive experiences of Distance Learning during the COVID emergency (DaD), explored the possibility that technologies work, in a methodologically oriented educational framework, from driving to inclusive educational processes and constitute the means to enhance participation in traditional settings and at the same time extend educational settings in extreme contexts of physical or digital isolation (AIELLO, DI TORE, DI TORE, & SIBILIO, 2013; S. Di Tore, Aiello, Sibilio, & Berthoz, 2020; S. Di Tore, Todino, & Sibilio, 2019; Giuseppina Rita Mangione, Di Tore, Di Tore, & Corona, 2015). These experimental paths have delineated new research scenarios that intersect with the unprecedented rapport between ubiquity, presence and distance in remote teaching that emerged as a result of the Covid-19 pandemic

1. Distance Learning in the COVID-19: a massive revival of the dynamics of face-to-face lessons

A critical element in affirming the identity between technology and distance was the role of the teacher.

Net of methodological, organizational and technological choices, a common element that emerged from investigations relating to teachers (DI TORE, ARDUINI, CHIUSAROLI, Annarumma, & Corona, 2020) is attributable to a sense of estrangement due to the disappearance of a series of indicators, on which teachers usually rely to conduct teaching experiences (G. R. Mangione, Pierri, & Iovane, 2012).

The combined effect of the intrinsic logics behind online teaching tools and the use that had been made of them, led to a massive revival of the dynamics of face-to-face lessons. This significantly impacted inclusive processes when combined with the already existing issues related to digital divide and drop-out rates.

It is no coincidence that both the teaching and the scientific communities had tried, often successfully, to overcome the logic of the face-to-face lesson. Key aspects of learning experiences such as space, time and interaction, had only found a partial redefinition in integrated digital teaching approaches. However, this result cannot be attributed to the structural limitations of the technological platforms but was due to the absence of methodological solutions and tools.

In fact, the Italian teachers, during the Covid-19 emergency period, adapted their remote teaching to the functions offered by the platforms with which they interacted. It is not our interest to demean the use of these technologies in teaching, but it is deemed important to shed light on the lack of attention to ergonomics needed to provide these platforms with specialized modules capable of facilitating the application of pedagogical models developed in educational research.

In this context, the Technologies = Distance equation risks eliminating the tension that has emerged in recent years between formal learning, based on "fixed curricula" prepared for an

idea of learning linked to the classroom space, and informal learning where students participate in intentional experiences and unintentional outside the traditional school setting (Looi et al., 2009). The classroom space, in the distance learning experiences actually carried out, migrates from the physical classroom to the virtual classroom, possibly purged of any form of "external" stimulus. Ultimately, the virtual classroom door seems even more closed than the real classroom door. In the virtual classroom, however, there are no students and there is no magister, there are their avatars. The learning-teaching process risks being entrusted to doppelgänger, and the formula of "learning anytime, anywhere" degrades into "learning elsewhere, elsetime". A paradoxical condition, which disperses the attention of the educating community on the access capacity offered by digital devices to more or less structured corpora and streams of information and at the same time forgets that those same devices that are considered the key to access ubiquity constitute first and necessary layer for the investigation of the here and now of the learner, and, consequently, for the construction of situation awareness, which is a fundamental variable of the teaching-learning process. Ubiquitous learning is characterized by the ability to build pervasive, conscious, acted, embodied experiences. In this perspective, mobile devices equipped with sensors used by students and teachers can function as a "learning hub" capable of collecting data deriving from the dynamic interaction between student and environment, giving meaning to the "learning situation" (Bentley, Shegunshi, & Scannell, 2009). This meaning of ubiquity does not ignore the classroom or the formal context, but integrates and expands the latter in the direction of a continuous flow in which the absence of a solution of continuity is guaranteed by the network and by the mobile devices that constitute its points access.

The eventual risks of the absence of connection between the results of pedagogical research and the tools used by teachers for remote teaching and integrative digital teaching are two:
- the first is that of relegating part of the pedagogical research to a mere reflection devoid of its practical potential application.
- the inability to capitalise on digital competencies acquired during the emergency period, in terms of use and management of the existing platforms that are not specifically designed for the Italian teaching staff, may well lead to the pre-existing COVID-19 situation – where traditional teaching methods prevailed.

2. Self-perception and the perception of others in digital environments
The line of research on self-perception and the perception of others in digital environments, developed at the Educational Research and Inclusive Didactics Laboratory of the University of Cassino and Southern Lazio concentrated on the production of digital research tools within the realm of educational interaction mediated by digital tools and supports. In this framework, the following projects have been initiated:
- Empathy game, video game and research tool aimed at primary and secondary school students to identify the maximum age when children normally abandon the condition of perceptual egocentrism and investigate gender differences in the process. The game represents the evolution for educational purposes of a video game designed for the measurement of perspective taking skills (Pio Alfredo Di Tore, 2017; P.A. Di Tore, Di Tore, Mangione, Corona, & Caralt, 2014). The prototype of the game from which this study started is aimed at assessing the age at which students develop perspective-taking and mental rotation skills. The shift from the scope of measurement to that of training required the software to be capable to adaptively suggest effective strategies appropriate to the user's profile. Notwithstanding the theoretical framework and the approach to the representation of spatial reference systems, the specific educational needs have led to a complete re-design of the application and to the introduction of a semantic layer that can adaptively support user through the design of a specific ontology for the educational version.
- Emotracker, software to recognise the students' basic emotions through the webcam (Chiusaroli & Di Tore, 2020). EmoTracker combines machine learning and face rec-

ognition with the analysis of gender, age and the six Basic Emotions identified by the Basic Emotion Theory to estimate the level of attention of user involved in digital learning environment, without using personal data. Emotracker records the data obtained in a database resident on a server with a frequency of six times per minute. The reports available to the teacher, relating to the individual student or for groups, are based on this data.

• Physical Avatar, an edu-robot aimed mainly at specific contexts (hospital schools, home schooling). It plays the role of a physical avatar representing a physically distant student in the environment shared by his peers (e.g. the classroom). Therefore, the robot will physically replace the student in the physical space and, through motorized webcams, will show him the environment from what would normally be his point of view when not away. It will also act as a counterpart for teachers and classmates, allowing them to physically interact with the robot, who will show, whenever possible, the face of the student participating remotely. The project is in fieri, and has not yet produced a usable prototype.

The designed prototypes have been applied in the CA.SP.I project. The main objective of this project is augmenting the inclusion of students with special needs at university who did not attain the higher secondary school certificate but only a certificate attesting the minimum objectives reached by the end of compulsory schooling.

Commencing in 2017, over the years, the project has seen an increase in the number of members enrolled spanning from 3 in the first year of testing, 9 in the second year, and 18 in the current year. All the participating students are regularly enrolled at the University of Cassino and Southern Lazio as special career students who have the same course programme as all the other traditional degree courses. CA.SP.I. constituted a natural environment for the testing and validation of prototypes.

Conclusion

The transition to digital in school is not just a question of devices, optical fiber, accessible, scalable and functional networks, tools that, unfortunately, we do not yet have and which we must provide universally as soon as possible, but it is a problem especially of new ways of thinking and acting (Bertagna, 2020). If the educating community continues, by inertia, to propose the same solutions considered valid fifty years ago, it cannot be surprised that the solutions do not resolve. It is not digital that frightens, it is its reductive meaning, at the same time weakened in the premises and powerful in the consequences, the claim to replicate in the online edition a model already worn offline, and of which the lockdown has only made the limits more evident.

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