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Digital Acculturation in the Era of Artificial Intelligence

Michel Durampart, Philippe Bonfils,
and Margarida Romero

Abstract This chapter examines AI integration in education, concentrating on acculturation, as a broad movement of appropriating digital tools. The chapter emphasises principals' involvement in supporting AI potential in schools and the complex interplay between digital technology and education. The chapter describes teachers' transition from personal to educational digital use across three phases of digital acculturation. It emphasises professional development by highlighting problems and motivations. The last part of the chapter discusses digital acculturation in AI and education, including medical expertise, vocational training, and special education. It finishes by analysing educational

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platform organisational changes and AI's ability to change learning dynamics and interfaces, raising new considerations about global education systems.

Keywords Acculturation · Digital culture · Educational technologies · Digital competencies

Introduction

The uses of educational technologies, of which artificial intelligence (AI) is a part, require a pedagogical reflection on the planning and orchestration of the learning activities. The representations and the culture of the actors, teachers, and students can impact the school organisation and are points to be taken into account in the integration of AI in educational settings (Bellás et al., 2023). This chapter pursues two objectives: on the one hand, to define acculturation to AI as a vast movement of appropriation of digital tools; and, on the other hand, in the light of the work of the Mediterranean Institute of Information and Communication (IMSIC), to analyse the digital acculturation in the AI era.

Acculturation is defined in broad terms as “the processes by which different cultural groups adapt to one another” (Brown & Zagefka, 2011, p. 131), but also the process of adoption of cultural artefacts such as digital technologies and the reduction of the digital divide of certain cultural groups (Vassilakopoulou & Hustad, 2023). The process of acculturation in the context of artificial intelligence concerns not only edtech professionals but the different educational stakeholders who, having developed their careers absent of AI, are now adapting to new educational practices and different types of teaching and learning processes.

Digital Acculturation from the Lens of Information and Communication Studies

Information and communication sciences have helped to highlight that the relationship between digital technology and education is complex,

iterative, and cross sectional (Bonfils, 2020; Durampart, 2016; Giraudon et al., 2020). In this context, researchers from the IMSIC research lab found that digital artefacts intended for learning activities (Bernard et al., 2018) tend to cause tensions within the school organisation. School organisation is highly structured in secondary education, which creates a tension when innovative approaches are required to adapt to the opportunities afforded by AI. In this context, Meyer et al. (2023) consider the importance of the principal's role in ensuring that the school's pedagogical team is able to create the necessary conditions for change.

Over the course of twelve years of research at the IMSIC laboratory, we found the concept of digital acculturation to be useful in classifying the broad movement of appropriation of digital technologies influencing pedagogy and educational practices. This concept arose as a useful heuristic in order to characterise an unstable, discontinuous, and diverse movement that encompasses the adoption of digital technology across a wide range of activities and approaches within the educational context. In this way, scholars working on such topics recommend thinking about “digital acculturation” rather than “digital culture” (Durampart, 2016). The primary challenge lies in integrating this ostensibly digital culture within the framework of economic and social well-being, where digital inclusion encompasses the broader capacity of individuals to effectively mobilise these technologies—a critical skill as the knowledge economy continues to expand its influence (Durampart, 2016). While it is difficult to recreate the breadth of the disciplines and initiatives in which we have been involved, we can retrace a few significant steps and milestones that have helped us better comprehend the concept of digital acculturation.

The studies of Pélissier et al. (2018) shows that only a minority of students exploit their “digital culture” with a view to integration and professional orientation, while showing the potential to consider creative pedagogies for improving the learners' experience. Even if formal learning is crucial to reduce the variance in proficiency levels among social actors, it remains necessary for them to develop new creative practices in the use of AI in contexts other than those related to leisure and interpersonal relationships. The challenge of digital acculturation would therefore refer

to a form of unstable, heterogeneous and disseminated economic, social, and cultural capital. It is constantly called into play and questioned, with different modes of adoption, in various contexts, while also referring to successive or alternating forms of formal and informal stacked learning.

The Three Levels of Digital Acculturation

The impetus for IMSIC's research projects on digital acculturation derived from a study carried out as part of the Provence-Alpes-Côte d'Azur (PACA) region's ICT observatory (Pélissier et al., 2013). Further insights were gathered from the Numécole project, an initiative from the Ministry of National Education to identify the digital uses of technology among French teachers with the aim of improving student outcomes and facilitating teachers' pedagogical practices (Durampart, 2016) It is from these projects that we developed the following framework to better understand the role of digital acculturation and its role in effectively navigating and utilising digital tools. This framework comprises three distinct levels; the acquisition of technological knowledge, the interaction between personal and professional uses of technology, and the use of technology in pedagogical practices.

First Level of Digital Acculturation

At the initial level of digital acculturation, teachers utilise digital tools for personal use rather than for interchange or sharing. The first stage of digital acculturation is concerned with knowledge acquisition through training. 82% of instructors between the ages of 31 and 50 (representing 77% of our respondents) completed pre-service teacher training.¹ 73% of them claim they use technology frequently, but 68% complain about insufficient training overall. Again, these teachers are more likely to

¹ The data derives from a Numécole research program occurring between 2014 and 2016. A questionnaire was sent to teachers in November 2015 with the aim of providing a quantitative analysis of experimentation with digital applications in the PACA region. Over 200 teachers responded representing 80 classes.

utilise information and communication technology (ICT) as a personal tool than as a tool for trade or sharing. Examples include software trials, do-it-yourself projects, self-learning, as well as shared learning in co-learning and multi-learning circumstances. These encounters, characterised by a variety of demands and expectations aimed at simplifying everyday life, serve as barriers to implementing these talents professionally. As a result, the absence of professional training makes developing an advanced degree of expertise impossible.

Second Level of Digital Acculturation

The integration of digital technology at the second level of digital acculturation seeks to promote the interaction between school and home and puts a range of technological applications at the service of educational activities. This level is situated in an unsuccessful relationship between private, personal, and domestic learning and those of the professional or educational world. The so-called innovative digital initiatives (Project Incubateurs, 2018–2019) are part of a worldwide ambition to employ digital media to enhance continuity between school and home.

However, moving digital applications from the private to the professional realm requires rehabilitation and instructional supervision. As one teacher commented on her survey, “The tablets are entering the establishment (i.e. schools) because they have entered our lives” (Durampart, 2016). This teacher also highlighted the importance of combining tablet use with an effective method of information retrieval to maximise the devices’ potential in the classroom. This phenomenon, known as porosity, refers to the permeation of digital technology into the school environment, directly impacting the organisation of schools.

Third Level of Digital Acculturation

The third level of digital acculturation involves teaching using digital technologies and includes the use of digital tools in education. Here again, the Numécole project was used to conduct extensive observations on digital learning. This programme included observations at

Toulon's underprivileged high schools and middle schools, study days with teachers, and a variety of digital incubator projects. The questions that emerged from these observations reflect the study's shifting focus from how digital tools are used to examining the specific interfaces from which these tools are accessed and interacted. Teachers participating in the Numécole experiment describe their professional uses of digital technology as word processing (90% of teachers), audiovisual documents (86%), web browsers (72%), teacher-created software or documents (69%), educational websites (62%), desktop publishing (49%), digital encyclopaedias (41%), online institutional resources (37%) and spreadsheets (18%), image and text edition (49%), and digital workspaces (43%).

The Numécole study also explored the motives and orientations that underpin the relationship between digital devices and teaching. Generally speaking, teachers' pedagogical practices are rather disciplinary (75%), although they indicate that they address cross-curricular methodological skills as soon as feasible (74%). Their biggest teaching challenge is student autonomy (77%). Individual and differentiated work prevail (77% and 56%) in classrooms where autonomous students are preferred (82%). The majority of participants also reported that they preferred to have student desks facing a blackboard (53%). Given this context, survey teachers declared that their main goals for using digital technology in the classroom were, in descending order of frequency: pedagogical differentiation, individualisation of learning, motivation, gamification, media variation (colours), test preparation, and media and information education.

We offer a critical method for studying the transformations caused by new educational media and digital mediations linked to new technologies. Digital acculturation helps us evaluate the emotive, psycho-cognitive, and pragmatic changes (Collet et al., 2021) of teachers and students facing mechanisation (Moeglin, 1993) and the rationalisation of learning that might be revived through the use of AI. Numécole instructors have proposed several ways to include ICT in instruction. These include the didactic approach, knowledge transmission, cognitive approach (80% of respondents ranked it first or second), school as intelligence development, the citizenship approach (school as a

place of socialisation), the cultural approach (school as a place of cultural integration), and the professional approach (school as a place to prepare for professional integration).

Digital Acculturation Within the Integration of Digital Technologies at School

We see acculturation as a paradigm for investigating the integration of digital technology in the classroom. Innovative programmes have been part of educational methods or dynamic initiatives, funded by the university, and present in teaching practices, for nearly 15 years. Students are stuck between contradicting injunctions and demands such as liberation, autonomy, individuation, involvement, commitment, support, and aid. They also include reintegration and accompaniment, which are seen as novel and stimulating dynamics provided by digital tools and technology.

We discovered in the Incubator programme that students saw school activities incorporating digital technology as an extension of their initiatives outside of the classroom. They continued to work in groups outside of class hours in order to develop transversal abilities. Knowing how to work as a team provided students with a higher level of autonomy, which is necessary for gaining subject-specific information. Across all observations, teachers stressed the contribution of digital tools in shaping the prevalent pedagogy by challenging routines and work habits and helping to break down existing barriers. Despite the time-consuming nature of technology, these tools permit the analysis of behavioural patterns and work habits and aid in decompartmentalisation.

Finally, digital acculturation is a concern of gaps between the usage and mastery of digital technology for both instructors and learners. It is also a question of the growth of the school form and, more widely, the educational environment, as well as a component of socio-cultural behaviours related with the usage of digital technologies (Kabuto & Harme, 2019).

Digital acculturation is also the prospect of discovering new instructional strategies to involve students in techno creative activities (Romero

et al., 2017). It is less about utilising technology and more about discovering how it may help create a deep knowledge of the United Nations' 2030 sustainability and development objectives jointly. In this regard, Faller and Heiser's (2022) CurriQvidéos device depicts several courses of action by first-time teachers who explain how digital tools (pedagogical robots, microcontrollers, etc.) and today's AI (using, for example, Google Teachable Machine, VittaScience, or 5J5IA) could be used to engage students in participatory activities that preserve natural and cultural heritage (Heiser et al., 2021). Finally, participating in the acculturation process implies an interest in the unstabilised evolution of education in reaction to, with, and by digital technology. This interaction is pedagogically led rather than assuming that the formation of digital citizenship would occur without deliberate involvement.

Perspectives for Digital Acculturation with Regard to the Perspectives of AI in Learning and Education

In this section we explore how resources and perspectives associated with AI issues might challenge, redirect, or redefine the observed level of digital acculturation. Originally, a Médipath programme (Collet et al., 2021) outside of an educational context enabled us to measure the issues at stake during the reorientation of medical proficiencies linked to time savings and the facilitation of expertise. A programme within higher education and professional learning in the naval field (E-DEAL) envisages the modalities of transfer and acculturation to industrial digital practices gathered around the concepts of industry 4.0. Data management and the integration of AI are becoming training issues in their own right as a result of business transformations through the integration of these technologies. This research project also questions the representations and culture of industry players regarding the potential of AI and learning analytics (Lang et al., 2017; Siemens, 2013) in terms of profiling, individualisation of training paths, empowerment, and accentuation of self-learning practices for communities of learners

in vocational training. Other insights emanating from special education show that, while digital technologies may crystallise tensions inherent in the field of social work, they are also able to support learners' performance, particularly in mathematics and reading (Bonjour & Daragon, 2019). This is significant given that many social workers find themselves unable to achieve these objectives. As such, AI offers support possibilities for cognitive and behavioural remediation for people with specific needs (Hopcan et al., 2022).

On the side of resources in educational platforms, questions oriented towards the evolution of organisational forms lead us to question the educational perspectives of AI. As educational platforms continue to incorporate AI technologies, there is an inherent need to reconsider how educators and learners adapt to and engage with the data generated by these tools. The challenges of AI in education seem to be oriented towards the identification of learning dynamics and contexts and the profiling, identification, and strategic construction of data, in order to initiate forms of learning centred on autonomy, self-training, and communities of learners in collaboration with teachers. These environments also establish the vision of a new performance of interfaces and mediations, supposedly experiential and efficient, in an approach that links the exploitation of artefacts, data, and new processes. We start from the challenges of translating AI into the ongoing digital acculturation with questions about the limits, constraints, and aporias in the education system or on forms of learning. It is then possible to consider AI as a break in continuity. Its integration into school or training environments still provokes speeches, debates, and past invocations, all of which find new vigour in the experiences and approaches related to AI and, at the same time, stimulate new issues or tensions at the heart of the world's education systems.

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