TECHNO REVIEW | 2022 | ISSN 2695-9933
International Technology Science and Society Review / Revista Internacional de Tecnología Ciencia y Sociedad
https://doi.org/10.37467/revtechno.v11.4418

LIGHTS AND SHADOWS OF EDUCATIONAL TECHNOLOGIES

Social Sciences teaching as a case study

Luces y sombras de las tecnologías educativas. La enseñanza de las Ciencias Sociales como caso de estudio

DIEGO LUNA , JOSÉ ANTONIO PINEDA-ALFONSO
University of Seville, Spain

KEYWORDS

Educational technologies
Educational resources
Educational innovation
Reflective teaching
Teaching experience
Social Sciences teaching
Case study

ABSTRACT

The aim of this paper is to contribute to a better and deeper understanding of the phenomenon of technological integration in today's schools. To this end, the methods of autoethnography and critical discourse analysis are used in a case study focused on the experience of one of the authors as a Social Sciences teacher in Secondary School. The system of categories constructed allows us to empirically confirm the apologetic nature of educational discourses outside the classroom, but also to identify a set of challenges, inconsistencies, and difficulties that have so far gone unnoticed in the scientific literature.

PALABRAS CLAVE

Tecnologías educativas
Recursos educativos
Innovación educativa
Enseñanza reflexiva
Experiencia docente
Enseñanza de las Ciencias Sociales
Estudio de caso

RESUMEN

El objetivo de este trabajo es contribuir a una mejor y más profunda comprensión del fenómeno de la integración tecnológica en las escuelas actuales. Para ello, se emplean los métodos de la autoetnografía y el análisis crítico del discurso, dentro de un estudio de caso centrado en la experiencia como profesor de Ciencias Sociales en Secundaria de uno de los autores. El sistema de categorías construido permite confirmar empíricamente el carácter apologético de los discursos educativos externos al aula, pero también identificar un conjunto de retos, incongruencias y dificultades desapercibidas hasta el momento en la literatura científica.

Recibido: 24/ 07 / 2022
Aceptado: 28/ 09 / 2022

1. Introduction

> Many reports and studies denounce the low and irrelevant integration of technology in current education, without any kind of positive effectiveness, with an uncritical acceptance, if not a strong support for outdated pedagogical models, clearly obsolete. (Pallarès et al., 2018, p. 19)

The attraction of educational technologies lies both in their connection with the concerns and demands of the new generations (Manzanares Triquet, 2020), and in their capacity to rethink and/or extend the traditional limits of the classroom, the textbook, or the blackboard. However, the assessment of the effects caused by the arrival of new media, supports, tools, and languages in schools, meaning technological integration in its various forms (Area-Moreira et al., 2016), should never be limited to a technocratic or merely instrumentalist vision. On the contrary, it is necessary to defend the development of rigorous knowledge, both theoretical and empirical, on the real impact that new educational resources are producing. Some of the perspectives developed in this respect are the following: the correspondences between technologies as they are used in schools (Area Moreira, 2010) and what is happening outside (Erstad et al., 2013); the strengths and weaknesses in dealing with new ICT projects (Montero & Gewerc, 2010; Skaftun et al., 2018); or the perceptions of the educational actors involved (Beckman et al., 2014; Campos Martínez, 2015; López Flamarique et al., 2019; Neufeld & Delcore, 2018).

In the document entitled *Opening up Education: Innovative teaching and learning for all through new Technologies and Open Educational Resources* (2013), the European Economic and Social Committee (EESC) established certain guidelines for the successful implementation of technological integration processes. The diagnosis made by some authors differs greatly from what was proposed by these recommendations:

- Educational policies have had an uneven degree of ICT implementation in schools and under the influence of large companies. According to Cañadel (2018), those companies are defining the role of ICT in education, rather than the traditional educational agents. This situation is supported by a "seductive discourse launched by large operators around the latest generation technologies" (Pardo Baldoví & San Martín Alonso, 2020, p. 175). Thus, authors such as Morrison et al. (2015) have wondered whether, in our market society, teachers and students have the technological products that they need, or only those that are imposed on them.
- There is no correspondence between investment in technological equipment in schools and the educational use made of the new resources. This was established in the European Commission's ICT in Education report (2019), which showed that Spain has a higher rate of technological equipment in schools, in terms of both the number of computers and other devices, and the percentage of schools with an Internet connection. However, according to the same report, these circumstances are not proportional to the educational use made of this equipment from a qualitative and innovative point of view (Jiménez Abad, 2015; Pallarès et al., 2018). The lack of a strategic dimension that brings new technological resources into classroom practice in an effective way, as pointed out by several authors (Akbiyik, 2010; Gabarda Méndez, 2015), prevents "conventional teaching-learning contexts" (Campión et al., 2014, p. 249) from being overcome and the interests of the students being truly addressed.
- New educational resources are being used as *ends* and not as *means*. Thus, for example, Rodríguez & Area (2017) maintained that, until now, curricular materials in digital format have been limited to reproducing the structure of printed books, without making any substantial or original methodological contribution. Gros (2019) sought to identify *genuinely innovative* materials, distinguishing them from *merely digitised content*, based on the following potentialities: they challenge; they maintain motivation; they combine languages; they incorporate narratives; they favour personalisation, ubiquity, and the production of content and products; and they allow both formative and adaptive assessments (pp. 191-194).
- New demands are continually being placed on teachers, hence the use of the term "content curator" to describe them (Bhargava, 2009). In order to take advantage of and make appropriate use of new resources, teachers today must master a vast set of skills, which may complement or directly force them to rethink some traditional teaching strategies. On their digital competence depends not only the design of new formats for teaching and learning, but also the possibility of instilling in students a set of skills, knowledge, and attitudes that are deeply valuable in a highly technological socio-cultural context.
- There are many other inconsistencies regarding teachers' perceptions of technology integration processes. Authors such as Mama & Hennessy (2013) have perceived certain inconsistencies between teachers' opinions and their actual way of teaching: "many of the teachers' reports could be misleading, providing a 'false' picture of reality" (p. 386). Some studies have pointed out that students themselves recognise that social networks can be more disruptive than educational (Álvarez de Sotomayor & Muñoz Carril, 2016). This idea was shared by Campos Martínez (2015), who observed a certain negative discourse on the use of ICT among students, apparently conditioned by family cultures.

The aim of this paper, derived from a broader PhD research, is to contribute to a better and deeper understanding of the phenomenon of technological integration in schools. To this end, we proposed to identify

the main challenges, inconsistencies, or contradictions that a Social Sciences teacher may find in his Geography and History classes in Secondary Education.

2. Methodology

2.1. Research design

In order to carry out this project, a case study was chosen as the overall methodological design, where, opting for a verbal discursive approach, the case was made up of all the converging discourses in the Geography and History classes in Spanish Secondary Education of one of the authors of this work. This case study was chosen for several reasons: 1) it was set in a discursive and practical context, in this case, a private school in the city of Seville, whose predominant school culture required in-depth analysis; 2) it was undergoing a strong epistemological crisis as a result of the didactic transformations that have developed in recent years; and 3) it was a professional environment with plenty of difficulties and contradictions to be understood before they could be subjected to any kind of proposal for improvement.

The corpus compiled during the fieldwork brought together a total of 12 texts from four different discursive fields: the legislative framework, the school, the Department of Social Sciences, and the classroom (see Table 1). The participants in the research belonged to the last of these contexts: a teacher and researcher, together with 44 ESO (Compulsory Secondary Education) students, forming a convenience sample. All were conceived as educational agents; not passive receivers and reproducers of certain pro-innovation discourses, but also as active and capable of interpreting and generating changes in the way that teaching–learning processes are approached, both directly and indirectly, through the production of their own discourses.

Table 1. Composition and organisation of the research corpus

Sub-corpora	Text
Spanish and Andalusian education policies	1) Ley Orgánica 8/2013, de 9 de diciembre (LOMCE).
	2) Real Decreto 1105/2014, de 26 de diciembre.
	3) Orden ECD/65/2015, de 21 de enero.
	4) Decreto 111/2016, de 14 de junio.
	5) Orden de 14 de julio de 2016.
School	6) School Educational Project.
	7) School Regulation on Organisation and Operation.
	8) Compilation of materials on the school's methodology.
Department of Social Sciences	9) Geography and History subject guide for students.
	10) Annual reports for the academic years 2017–2018 and 2018–2019.
Geography and History class	11) Interviews with 44 students (11–15 years old).
	12) Teacher-researcher's diary.

Source: own elaboration, 2022.

2.2. Methods, techniques and instruments

To develop this case study, the methods of data collection and analysis chosen were autoethnography and (auto) critical discourse analysis, both applied in line with the parameters of Grounded (Strauss and Corbin, 2002). Autoethnography was conceived, at the same time, as an adequate procedure to overcome some of the theoretical-methodological shortcomings detected in the literature, thanks to its great narrative-reflexive potential (Adams et al., 2015; Ellis, 2016; Mitra, 2010; Starr, 2010; Wamsted, 2012). As a research strategy it was perfectly compatible with the structure of the case study and with the method of critical discourse analysis, and it was also a didactic strategy that would ultimately allow for a pedagogical awareness of a reality for which the autoethnographer himself was partly responsible.

On the other hand, critical discourse analysis depends on several key aspects of the research: an eminently discursive theoretical–methodological positioning, contrary to any attempt to dissociate discourses and practices (Jäger, 2003) or texts and contexts; a predominant interest in the use of verbal language, understood as the main means of interaction and construction of people's reality and their corresponding intentions (Fairclough, 2003; Pini, 2009; Wodak and Meyer, 2003); the deconstructive and *local* perspective of the research, centred on the possibility of understanding the existing regimes of meaning based on a very specific case study; the structure of

the overall analytical procedure itself (Pardo Abril, 2013), as will be seen in the following subsection; and, finally, a stance that is not only critical of socio-cultural reality, but also self-critical reality, insofar as part of the critically analysed discourses was produced by one of the researchers himself.

This methodological approach was directly inspired by previous research and teaching experiences. It is worth highlighting the use of techniques applicable to both quantitative and qualitative data, and both deductive and inductive in nature, always taking into account the demands of the object of study and its particular discursive-verbal approach (see Table 2). The combination of all these methodological elements was key to knowing and understanding the way in which the participants experienced the School reality, as well as the interactions that they established among themselves.

Table 2. Relationship between the methods, techniques, and instruments used in this research

Methods	Data collection techniques	Analysis techniques	**Instruments**
Autoethnography	Participant observation		Teacher/researcher's diary
	Semi-structured interview		Interview script
(Self)critical discourse analysis		Pre-analysis	
		Lexicometric analysis	MAXQDA and Sketch Engine
		Content analysis	Mixed category system
		Linguistic and interpretative analysis	

Source: own elaboration, 2022.

2.3. Analysis procedure

The analysis procedure, inspired by the proposals of several authors (Pardo Abril, 2013; Wodak and Meyer, 2003), although specifically designed for this research, comprised four complementary phases:

1. Pre-analysis, where the texts of the corpus were characterised in order to discover their heuristic potential in relation to the research objectives;
2. Lexicometric analysis, using techniques based on textual statistics (word count, identification of key segments, recognition of co-texts, etc.), which made it possible to extract previously unnoticed information on frequencies and associations;
3. Content analysis, materialised in a system combining both deductive categories (identified in the theoretical framework) and inductive categories (from the data analysed);
4. Linguistic–interpretative analysis, focusing on the discovery of the semantic networks, conceptual schemes, cultural models, and ideologies present in the texts, based on the identification of the linguistic resources and procedures used.

This paper focuses specifically on the third of these phases, an intermediate moment between the lexicometric exploration and the linguistic–interpretative deconstruction of the different levels of meaning present in the discourses under study. Using Pardo Abril's terms, we can say that the results of this third analytical moment correspond to the textual material necessary to move from "quantitative salience" to "cultural salience" (2013, p. 122).

In this way, content analysis offered the most appropriate response to the challenge of managing and organising a large and diverse corpus, providing a more complete and elaborated vision of the themes, topics, contexts, and discursive connections than that offered in the pre-analysis phase. To this end, we opted for the construction of a mixed system of categories, defined by the confluence of a series of deductive categories, derived from the theoretical framework of the research and others of an inductive nature; that is to say, inspired by the meanings contained in the texts analysed.

In practice, this strategy involved the progressive transformation of a first version of the system made up of exclusively theoretical categories (T), passing through another derived from the first readings of the corpus texts, until reaching a definitive version where some of the original categories were abandoned or replaced by new emerging categories (E), according to the results from the data (see Table 3). In this way, the maintenance of certain theoretical categories was justified on the basis of the verification, in the case study, of the same assumptions identified in the theoretical framework. On the contrary, the emergence of the categories was due to the appearance of a series of attributes specific to the case study, not previously identified in the existing theory.

Table 3. Category system on which this work is focused

Category	Code	Subcategory	Code
Tecnoparadoxes (E)	TEPA	Apology for ICT (T)	AICT
		Digital incompetence (E)	DINC
		Paper nostalgia (E)	PANO

Source: own elaboration, 2022.

As the table above shows, the system of categories developed contemplates two main dimensions or levels: the categories themselves and their corresponding subcategories. On the one hand, the categories represent large thematic constructions that connect the different discursive topics dealt with in each subcategory. On the other hand, the subcategories find their *raison d'être* in the existence of a set of attributes that, although dispersed in the texts of the corpus, allow each of these topics to be characterised. When developing these topics, one of the most commonly employed strategies is to contrast the different treatments of the same aspect according to the discursive field from which the analysed text fragment originates.

Following the above logic, the denomination of each category basically responds to the thematic grouping of various subcategories, while the titles of each subcategory attempt to represent, as faithfully as possible, the grouping of the respective attributes that make them up. For this purpose, in some cases, expressions are taken from the theoretical framework; in others, from the terms that exist in the analysed texts themselves; and in others, from neologisms formed by the variation of textual terms.

3. Findings: Technoparadoxes

I like to use a certain variety of resources, but not excessively: a digital book that I prepare myself, with different multimedia files and interactive activities, as a support for study; a presentation that I make with PowerPoint, with little text (mainly titles), some selected historical sources, to analyse on the fly, and many images from the Internet (always of good quality); a notebook in which to do activities and exercise the wrist; the blackboard to support explanations with improvised diagrams or strange words; short videos (fragments of documentaries or some from YouTube channels such as Academia Play); physical and political maps solved in both digital and printed format; online applications for monitoring students (Kahoot! , Quizizz, Socrative, GoogleForms, etc.); and, in general, all kinds of digital resources (virtual visits to relevant museums, Google Earth, Global Press, digital newspaper libraries, etc.). [TEPA-T12]

Based on the variety and quantity of resources referred to in the diary, technological integration seems to coincide harmoniously with the survival of traditional materials and formats (notebook, blackboard, printed maps, etc.). However, some fragments criticise the arrival of certain resources, regardless of their function or nature: "There is no analysis whatsoever of the real need for new resources. At the beginning of each school year, they show us new acquisitions (screens, a coffee machine, coloured chairs, etc.), like someone showing us what Santa Claus has brought (...)" [TEPA-T12]. In fact, it seems that many of these "acquisitions" are not even intended for the entire teaching staff: "Today they told us that they had bought four virtual reality glasses. I wonder if I will ever be able to use them in my classes or, like so many other times, this will be the preserve of my colleagues in Infant and Primary (...)" [TEPA-T12]. Along with the virtual reality glasses, another major innovation at the School is the Clevertouch, the impact of which is described in the following extract:

> The Clevertouch is like a giant smartphone. A new gimmick to attract the attention of families when they come to school meetings. However, it's not as big as the image that the projector allows you to get, nor as private as your own computer, so I don't see the point (...). In the workshop they gave us, they limited themselves to explaining how to turn it on, where the Internet explorer is and how the blackboard works (...). I use it sometimes to play an interactive map game with the pupils, like Educaplay, because it is tactile and it is fun to go out and click on the province; little else. I think they are getting more out of it with the youngest children. [TEPA-T12]

When it comes to designing and using new resources, the annual reports of the Department of Social Sciences highlight lack of time as one of the main problems for teachers: "On a negative note, it must be acknowledged that the lack of time to prepare materials has prevented the creation of their own games, when many of the tools imported from various Internet sites don't include certain references to be studied by the students, limiting their success" [TEPA-T10]; "(...) it must be pointed out that, unlike the previous course, this year we have not worked with the Global Prensa website due to lack of time" [TEPA -T10]. In fact, the issue of time means that the teachers' disposition towards the use of new technological resources is negative: "This afternoon's workshop was on EdPuzzle. I don't think the trainer managed to convince anyone of the virtues of the tool, because all we could think about was the amount of things we had to do this week" [TEPA-T12].

In the following diary excerpt, some of the teaching strategies used to provide tentative responses to the Principal's request, in this case, to produce their own videos, are outlined:

> In each topic of the book, I open a section entitled "Introduction" where, week after week, I progressively upload the videos I want the students to see, in order to comply with the flipped classroom. This can become another major piece of gibberish. The ideal for the School would be for me to make my own videos, although it doesn't happen because of the amount of things I already have to do. What I do is to resort: 1) to Aula Planeta's own platform, whose short videos (fragments of documentaries) are very good for the lower courses, although sometimes they are insufficient for the higher ones; or 2) to YouTube, and, in particular, to channels such as AcademiaPlay, where you can find good summaries in quite attractive videos, which last between 5 and 10 minutes. [TEPA-T12]

The diary also provides other observations that point to certain infrastructure or resource management problems at the school level: "The student brought her homework, but could not put the presentation on because she had problems connecting to AppleTV" [TEPA-T12]; or "(...) my students try to search for information on the Internet and many of the web pages are blocked, even pages that I have recommended to them" [TEPA-T12]. Along the same lines, the main problems seem to be related to the wifi network: "Since I have been working here, there has not been a single day when the network has worked perfectly. On test days, as we are now, the network is overloaded because all the pupils have to connect at the same time (...)" [TEPA-T12].

3.1. Apology for ICT

The results grouped within the first subcategory reflect what we could call the official pedagogical stance on ICT shared by both the normative and organisational texts in our corpus. The general idea, as stated in the LOMCE, is that: "Information and Communication Technologies will be a fundamental part of producing the methodological change that will lead to achieving the objective of improving educational quality" [AICT-T1]. On this basic principle, it is stated that: "The use of a variety of materials and resources should be promoted, especially considering the integration of Information and Communication Technologies in the teaching-learning process that allow access to virtual resources" [AICT-T3]. To achieve this: "The use of Information and Communication Technologies in the classroom will be promoted by educational administrations and school management teams as an appropriate and valuable didactic means to carry out teaching and learning tasks" [AICT-T1].

When it comes to justifying the supposed need to incorporate ICT into educational processes, a wide variety of reasons are put forward, although all of them are related to the pedagogical principles defended by the LOMCE. The most general ones present a vision of ICT as an enabler of such revolutionary changes as personalised and competence-based learning: "Personalised learning and its universalisation as major challenges of educational transformation, as well as the satisfaction of learning in non-cognitive competences, the acquisition of attitudes and learning by doing, demand the intensive use of technologies" [AICT-T1]. With regards to personalised learning, the relevance of adapting the use of ICT to "the needs and pace of each student is particularly stressed. On the one hand, it will serve for reinforcement and support in cases of low performance and, on the other, it will allow the knowledge transmitted in the classroom to be expanded without limitations" [AICT-T1].

Also coinciding with the global justification of the LOMCE educational reform, another of the main arguments put forward has to do with the supposed need to adapt the educational system to the interests of the "new generations": "Connecting with the habits and experiences of the new generations requires an in-depth revision of the notion of the classroom and the educational space, only possible from a broad reading of the educational function of the new technologies" [AICT-T1]. Finally, within the self-justifying argument, we also find a conception of ICT as "a key tool in teacher training and in citizens' lifelong learning, as it allows them to make training compatible with personal or work obligations and will also be a key tool in the management of processes" [AICT-T1].

From this point, it is interesting to trace the presence of ICT in the respective curricula of the ESO subjects. Specifically, as shown in the following table, ICT seems to have a greater weight in subjects such as Mathematics and Technology:

Table 4. Selection of fragments on the topic *presence of ICT in ESO subjects*

Subject	Excerpt	Code
Sciences applied to professional activity	"Section 3 is the most innovative for students and should be worked on by combining theoretical and research aspects, using Information and Communication Technologies, which will be a very powerful tool for students to learn about the latest developments in this field at global, state and local level".	AICT-T2
Mathematics oriented towards academic education	"The use of ICT resources in the teaching and learning of mathematics, calculators and specific software should become common tools for the construction of mathematical thinking, introducing novel elements such as multimedia applications such as interactive books with simulators, automated correction and self-assessment questionnaires, etc. which, in any case, should enrich the student assessment process. In addition, the use of blogs, wikis, CMS content managers, e-learning platforms, multimedia repositories, online applications and collaborative environments favour constructive and cooperative learning".	AICT-T5
Mathematics	"Calculators and specific software must become standard tools, introducing novel elements such as multimedia applications which, in any case, enrich the student assessment process: interactive books with simulators, automated correction and self-assessment questionnaires and resources based on competence-based learning. In addition, the well-planned and organised use of blogs, wikis, CMS content managers, e-learning platforms, multimedia repositories, online applications and collaborative environments provide us with a barrier-free education".	AICT-T5
Technology	"Special emphasis will be placed on the use of innovative resources such as personal learning spaces: portfolio, webquest, project-based learning, gamification, flipped classroom, etc.".	AICT-T5

Source: own elaboration, 2022.

With regards specifically to the subject of Geography and History, the focus of our interest, it seems that the attention paid to ICT is not as complete and detailed as in the examples shown. On the one hand, the explanation of how the subject contributes to the development of digital competence is reduced to the following idea: "through the use of applications and programmes that allow the collection, organisation, presentation and editing of information and conclusions of contents and projects related to this subject" [AICT-T5]. On the other hand, within the 16 objectives of the subject, the only information explicitly referring to ICT is that which appears in the last of them, and it is not very extensive either:

> 16. To participate in debates and oral presentations on current world problems, the historical evolution of human social formations and the most relevant characteristics and challenges of the natural environment both in Andalusia and the rest of the world, using information and communication technologies for the collection and organisation of data, respecting the turns of speech and opinions of others, analysing and valuing points of view other than their own and expressing their arguments and conclusions in a clear, coherent and appropriate manner with respect to the vocabulary and procedures of the social sciences. [AICT-T5]

In line with this lack of clarification, the section on methodological guidelines for working with the subject only makes two brief mentions of ICT. On the one hand, we are told that: "These strategies, lines and methodological elements will require the intensive use of Information and Communication Technologies (...)" [AICT-T5]. On the other hand, when talking about "resources", ICT are conceived fundamentally as tertiary sources of information on Andalusia:

> Resources play a very important role in the development of the aforementioned methodological orientations and strategies. In Andalusia we have a wide variety of sources and opportunities for their compilation and organisation, coming, in addition to those hosted and originating in cyberspace, from public bodies (museums, libraries, natural parks, archaeological sites, town and provincial councils, the Geographical Institute of Andalusia, the Andalusian Heritage Institute, the Andalusian Institute of Statistics, the Andalusian Ombudsman, the government of the Junta de Andalucía or projects and programmes, as well as repositories managed by the Regional Ministry of Education, etc.) and private entities (NGOs, associations of all kinds, cultural foundations, etc.). [AICT-T5]

In assessing the place of ICT in the school context in relation to our case study, we could begin by stating that: "At the school, innovation is completely linked to the use of technological resources (iPads, applications, Clevertouch, etc.)" [AICT-T12]. In fact, from the Social Sciences Department, there seems to be a vision of ICT as resources to improve the way of working on certain content: "Faced with the problems raised by the study of biographies:

revise the notes already made to make them more attractive to pupils and create interactive activities on this content" [AICT-T10]. In terms of technological devices, the undisputed protagonist is the iPad:

> One of the most striking features of the way of working at the school is the use of the iPad as a basic and essential work tool from 5th EPO to 3rd ESO. From 4th ESO onwards, the use of laptops is preferred due to their convenience when carrying out more complex work. The use of these devices is promoted in all subjects and their purchase is paid for by families, as just another school material. In this type of school, it is quite clear that families do not have any problems when it comes to meeting this type of expenditure. [AICT-T12]

As we specified at another point: "Through the iPad, students access Aula Planeta's digital books and all kinds of educational tools, carry out Internet searches, take notes, edit video and presentations, etc." [AICT-T12]. Confirmation of all this can be found in the annual reports of the subject: "The use of the iPad and access to the Internet through it have been fundamental. The guided search for information depended directly on this device, without which it would not have been possible to develop the type of project proposed" [AICT-T10].

To conclude this section, it is appropriate to list those extracts from the Department's reports that allow us to know the specific typology of resources used, including the iPad:

Table 5. Selection of excerpts on the topic *resources used in the subject of Geography and History*

Excerpt	Code
"The iPad has also served as a tool with which to record, making it possible to carry out a work format, such as audiovisual work, which allows students to feel doubly involved in their own process of discovery: they often portray themselves as the journalists or characters who are the protagonists of the subjects".	AICT-T10
"In terms of creative tools, one of the most widely used in this regard has been iMovie. Video editing is in fact one of the options most enjoyed by the students when developing the group projects that have articulated each theme".	AICT-T10
"We have also worked occasionally with applications such as Kahoot, Quizizz, KeyNote or Picollage to create games and presentations, creating photographic montages with images that the students have found on the Internet".	AICT-T10
"The Didactalia and Educaplay website, thanks to the large number of interactive maps on it, has also proved very useful for studying physical and political geography maps".	AICT-T10
"One of the most popular tools, in this case for evaluation, and one that students have liked the most, has been Socrative, where tests can be created following three different types of questions, with the possibility –so useful in Art History– of uploading images".	AICT-T10
"Numerous quizzes have been created and practised in class, both in teams and individually, as well as a multitude of web tools have been searched and selected and have been hosted in the digital book, within a specific topic of maps (another of the novelties of this course), so that students could study in an alternative way".	AICT-T10
"All these materials have been made available to students on the Aula Planeta platform, which has proved to be a key tool in this respect".	AICT-T10

Source: own elaboration, 2022.

3.2. Digital incompetence

The second subcategory brings together all the information relating to the way ICT is used in our case study. According to Orden ECD/65/2015, de 21 de enero, an ideal use should allow "solving real problems efficiently, as well as evaluating and selecting new sources of information and technological innovations, as they appear, according to their usefulness in undertaking specific tasks or objectives" [DINC-T3]. Precisely for this reason, the regulatory texts, and especially the aforementioned Orden, defend the need to train digital competence, understood within a group of eight key competences as comprising "various skills related to access to information, processing and use for communication, content creation, security and problem solving, both in formal and non-formal and informal contexts" [AICT-T3]; or, in other words, "that which involves the creative, critical and confident use of information and communication technologies to achieve goals related to work, employability, learning, use of leisure time, inclusion and participation in society" [DINC-T3].

According to Orden ECD/65/2015, de 21 de enero, the constituent elements of digital competence include: "in addition to the adaptation to the changes introduced by new technologies in literacy, reading and writing, a new set of knowledge, skills and attitudes necessary today to be competent in a digital environment" [DINC-T3]. Hence, some of the prerequisites for a high level of development in this competence include:

(…) knowledge related to basic specific language: textual, numerical, iconic, visual, graphic and sound, as well as their decoding and transfer patterns. This involves knowledge of the main computer applications. It also involves access to sources and processing of information, and knowledge of the rights and freedoms of individuals in the digital world. [DINC-T3]

To these requirements should be added the following:

The acquisition of this competence also requires attitudes and values that allow users to adapt to the new needs established by technologies, their appropriation and adaptation to their own purposes and the ability to interact socially around them. It is a question of developing an active, critical and realistic attitude towards technologies and technological media, valuing their strengths and weaknesses and respecting ethical principles in their use. On the other hand, digital competence implies participation and collaborative work, as well as motivation and curiosity for learning and improvement in the use of technologies. [DINC-T3]

According to the abovementioned Orden all of the above aspects should be approached from the perspective of the following six dimensions:

Table 6. Selected excerpts on the implications of the dimensions of digital competence

Dimension	Excerpt	Code
Information	"Understanding how information is managed and how it is made available to users".	DINC-T3
	"Knowledge and use of different search engines and databases, knowing how to choose those that best meet one's own information needs".	DINC-T3
Evaluation	"Knowing how to analyse and interpret the information obtained".	DINC-T3
	"Collating and evaluating media content for validity, reliability and appropriateness across sources, both online and offline".	DINC-T3
	"Knowing how to transform information into knowledge through the appropriate selection of different storage options".	DINC-T3
Communication	"Becoming aware of different digital media and various communication software packages and how they work and their benefits and shortcomings depending on the context and the target audience".	DINC-T3
	"Knowing what resources can be shared publicly and the value they have, i.e. knowing how technologies and media can enable different forms of participation and collaboration for the creation of content that produces a common benefit".	DINC-T3
	"Awareness of ethical issues such as digital identity and norms of digital interaction".	DINC-T3
Content creation	"Knowing how digital content can be produced in different formats (text, audio, video, images)".	DINC-T3
	"Identifying the programmes/applications best suited to the type of content you want to create".	DINC-T3
	"Contribution to public domain knowledge (wikis, public forums, journals), taking into account copyright regulations and licences for the use and publication of information".	DINC-T3
Security	"Understand the different risks associated with the use of online technologies and resources and current strategies to avoid them".	DINC-T3
	"Identify appropriate behaviours in the digital environment to protect your own and other people's information".	DINC-T3
	"Understanding the addictive aspects of technologies".	DINC-T3
Problem solving	"To know the composition of digital devices, their potentials and limitations in relation to the achievement of personal goals".	DINC-T3
	"Know where to look for help in solving theoretical and technical problems".	DINC-T3
	"A heterogeneous and well-balanced mix of the most important digital and non-digital technologies".	DINC-T3

Source: own elaboration, 2022.

In contrast to the detail reflected in the fragments of the previous table, it is striking that, in the rest of the corpus, the information most similar to what could be considered guidelines for working on digital competence,

or at least using ICT, is limited to a series of instructions contained, for the most part, in the Geography and History subject guide for students:

Table 7. Selection of excerpts on the topic *ICT use guidelines*

Excerpt	Code
"If you are going to use the iPad, use only the software that is necessary for your work".	DINC-T9
"Remember to take your eyes off the iPad screen, so you should use notebooks/portfolios to make outlines, summaries and concept maps".	DINC-T9
"In order to work on content related to the press, all students at our school have access to the Global Prensa portal. From the materials available here, which are constantly updated, it is very easy to work on the news: through pre-designed activities or simply by discussing the reality they reflect".	DINC-T9

Source: own elaboration, 2022.

Regardless of the guidelines set out above for working on digital competence in its most complex sense, Orden ECD/65/2015, de 21 de enero especially encouraged the use of the portfolio as a work tool, for several reasons: "it provides extensive information on student learning, reinforces continuous assessment and allows learning results to be shared. The portfolio is a motivating tool for students that enhances their autonomy and develops their critical and reflective thinking" [DINC-T3]. Interestingly, in this functional aspect, we can establish a direct parallelism with what happened in the subject of Geography and History, as it was proposed in our case study:

> The blog works as a learning portfolio and contains most of the individual work done by the learner. It is made up of a series of compulsory activities, as well as, if desired, some voluntary activities to improve the grade. Those activities focused on the development of procedural skills (comments on sources or graphs, problems, etc.) will be carried out in class, while those focused on study will be started in class and finished at home or directly at home as study techniques… [DINC-T9]

The subject guide also indicated the following requirements: regarding the sections of the portfolio, "each of them will correspond to a different entry, published in approximately the order proposed" [DINC-T9]; and, regarding the activities, "they must be supervised by the teacher before starting the new topic, with the deadline for submitting the blog being the same day as the topic exam. Each activity will have its corresponding mark and each topic may consist of 8 or 10 blog entries" [DINC-T9]. However, the following comment from the annual reports of our subject can be contrasted with the apparently rigorous nature of these instructions:

> The great novelty and, at the same time, the great failure of this course in terms of tools has been the digital blog. Despite spending too many classes and too much time explaining how the Blogspot platform works, the difficulties of use encountered at the beginning did not disappear at any time, as the problems of incompatibility with the iPad and the instability of the wifi network prevented it from being used correctly. [DINC-T10]

Another example of the difficulties associated with the use of the portfolio can be deduced from the students' answers to the question "How do you usually approach the search for information when doing a research project (essay, project, etc.)?", included in the interview:

Table 8. Selected student responses on how to search for information for research projects

Excerpt	Code
"First I look at the title and think of words that might be related to that topic. Then I look at the Aula Planeta book and then I compare three or four websites to see if the information I have is correct".	DINC-T11
"I copy it from Aula Planeta".	DINC-T11
"First I look up the information on websites like Wikipedia and then I look at other people's projects on the same topic to compare and see how they explain the information. I also outline the order in which the information should be presented".	DINC-T11
"When it comes to looking for information for a project, for example, I generally like to look at as many pages as possible, and to dose and summarise what I have found on each one, thus making my definition clearer".	DINC-T11
"The first thing I do is to make a mental sketch of what I need to look for. Then, I look up what I need in several pages and read it. From what I read, I put it all together and take what I think is best and most important. After collecting the information, I develop it all, copying and pasting it into 'notes' or a document. Here I summarise it and make it coherent to form all the information".	DINC-T11

"Each one does research on a specific area. You have to know what to look for, then you go on the Internet, make a summary of what you find and put it into the project".	DINC-T11
"I copy-paste it and then summarise it".	DINC-T11
"First I read the notes from Aula Planeta and then I put the information from Aula Planeta. Then I look for information on Wikipedia and make a copy-paste".	DINC-T11

Source: own elaboration, 2022.

3.3. Paper nostalgia

The last subcategory devoted to the role of ICT in our case study represents, in a way, the assessment that the research subjects themselves make of the use of certain new resources. In this respect, the undisputed protagonist is the digital book. As stated in the annual reports of the subject of Geography and History: "In 1st ESO we have worked with the digital book hosted in Aula Planeta, prepared by the teachers generally from the complementary materials and resources offered by the platform, together with other new ones such as geography maps, videos, various web applications and diagrams" (...) [PANO-T10]. On this same aspect, we found the following comment in the diary:

> When preparing the topics for Aula Planeta, our digital book, a task that I don't even know how long it can take me every week, I have to take into account both the Department's materials (diagrams, notes, biographies, historical maps, etc.), on which the tests are then based, and the resources offered by the platform itself (videos, interactive activities, in-depth activities, etc.), as well as others that I think are needed and that I look for on the Internet (images, other videos, timelines, etc.). In order to merge all these sources so that the students do not get lost, I always follow the same scheme. [PANO-T12]

The reports also state that, "in addition to containing the basic materials for studying the subject, this medium [the digital book] has also served as a channel of communication between the teacher and the students on some occasions" [PANO-T10]. However, judging by other assessments, the functionalities provided by the digital book should not be considered too revolutionary: "(...) when I arrived at the School, the Aula Planeta digital book seemed to me to be the best. Accustomed, as I had been since I was a child, to printed books. Now I see it for what it is: a kind of shared folder, very nice, where I post resources and materials for the students (or their families) to see" [PANO-T12]. In fact, fragments such as the following denounce the use of the digital book as a mere container for the same things that printed books already provide:

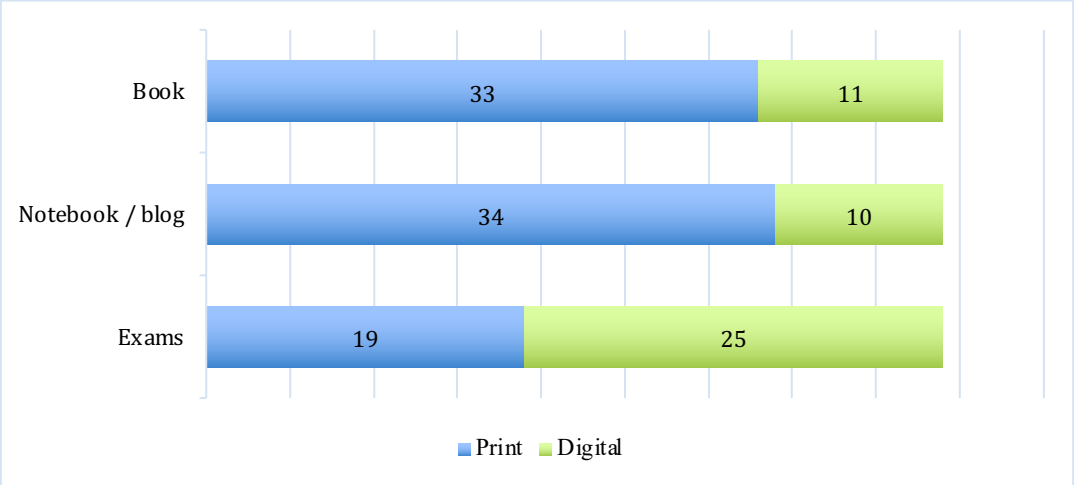
> Today I found out that there are some colleagues, more specifically among the veterans of the School, who are dedicated to transcribing the textbooks of a lifetime, from trusted publishers, in Aula Planeta. This is what they mean by producing their own digital content. This sounds like a crime to me, but I also understand that it can be difficult for some people to get up to speed on these kinds of issues as they go along, shortly before they retire. [PANO-T12]

Finally, the similarities between the digital book and the printed book seem to go beyond the purely didactic. According to the following excerpt, what happens in many cases is that the school families themselves, conditioned by a school culture that has not yet fully assimilated the functionalities of the digital book, print the contents of the book to make it as similar as possible to the properties of the printed book:

> What many parents do is to generate the pdf of the digital book and print it out. This is the most important thing for them, as it ensures that the children study without being distracted, avoiding the temptation to open other pages. Many of them, by mail or directly in the tutorials, ask me to have each topic completely open on the first day we start working on it in class. That way they don't have to bother to generate a pdf every week. I don't plan to do this, because: 1) it is impossible for me to have all the topics for all the courses ready on time; 2) I know that many students get overwhelmed when they see topics of forty pages, so I prefer to divide the study week by week. In any case, the conclusion is that we still have something very similar to the book of a lifetime. [PANO-T12]

Students' opinions are the best source for understanding the reception of both the digital book and other new resources. In this case, we focus on the answers to the question "What do you think of using a digital book instead of a printed one? And of using a digital blog instead of a notebook? How do you prefer exams: written or in digital format? Why?". The statistical results for each of the three resources asked about (book, notebook/blog and exams) are given below:

Figure 1. Student preferences for *print-digital* formats



Source: own elaboration, 2022.

The following tables highlight some of the most complete and representative responses for each of the items asked about in the interview:

Table 9. Selection of students' opinions on the preferred book format

Excerpt	Code
"As for the book, I prefer it a thousand times more in paper because we can make notes, underline, when you don't have Internet you don't have problems to access it".	PANO-T12
"I prefer to have a paper book because digital books distract me and give me a headache".	PANO-T12
"I prefer the digital book, as it is not so boring when the teacher does it".	PANO-T12
"I prefer digital books because imagine if you leave your book in class and you can't study and it's more practical".	PANO-T12

Source: own elaboration, 2022.

Table 10. Selection of students' opinions on the preferred format for the notebook/blog

Excerpt	Code
"I'm a disaster when it comes to blogging: I can't add things, the texts disappear, everything disappears... so I prefer the notebook".	PANO-T12
"I prefer a notebook as has always been done to improve handwriting and spelling".	PANO-T12
"I prefer the blog in digital format because if I lose my notebook, it's on my iPad".	PANO-T12
"I like having a blog better, as you can organise yourself better, having the material catalogued and well organised".	PANO-T12

Source: own elaboration, 2022.

Table 11. Selected student opinions on the preferred format for exams

Excerpt	Code
"As far as the exam is concerned, I think I prefer a written one because I can go into more detail".	PANO-T12
"I prefer the written exams because they are usually topics to be developed and in digital exams they are very complicated questions".	PANO-T12
"Digital examination because it is much more convenient and easier to do".	PANO-T12
"I prefer the digital exam, because it is less tiring for my hand".	PANO-T12

Source: own elaboration, 2022.

It is interesting to see in the annual reports how certain student preferences are taken into account in order to rethink the resources chosen for the coming years. Thus, for example, we find statements such as: "Faced with the problems caused by the use of the digital blog and the consequent weariness of the pupils, we hope to return to the paper notebook" [PANO-T10]; "continue with the notebook and the monthly essays" [PANO-T10]; "continue with the individual tasks on paper" [PANO-T10]. It is also appropriate to supplement the students' views on the problems of working with the iPad screen with some observations recorded both in the diary and in the departmental reports. These bring to the table new issues related to the discipline and the existing infrastructure of the school, respectively:

> This morning, I confiscated an iPad again. Through the classroom window, I caught a student, a repeater with serious basic deficiencies, looking for Netflix series on his screen. It is clear to me that the students with the most difficulties and attention problems are, without a doubt, the most disadvantaged by the use of the iPad. This profile of student is, paradoxically, the first to develop an addiction, sometimes quite significant, to the use of technological devices. [PANO-T12]

> A negative aspect to be highlighted is the scarce access to Internet and technological devices already mentioned in the previous paragraphs. This has sometimes limited the development of more innovative activities. However, these difficulties have been overcome with the development of activities such as murals, newspaper front pages, debates, characterisations of historical figures, group diagrams, etc. In addition, it has been possible to make use of applications such as Kahoot, although the pupils have not had mobile devices, but have been writing down their answers. [PANO-T10]

Faced with these difficulties generated by the use of the iPad as a regular work tool, it is interesting to see how some teaching decisions abandon the idea of relying on ICT and seek to recover formats that are very characteristic of the school tradition. One of them is the acetate: "Faced with the boredom that many pupils feel when studying maps, a complete atlas of transparencies has been developed to facilitate the study and understanding of maps (in the process of being developed by the Department)" [PANO-T10]. The following extract from the diary, with which we conclude this subcategory, explains this proposal in more detail:

> As much as the school tries to appear to be committed to the new educational tools, the Department's management has asked me to Photoshop all the maps that the kids have to study, so that they can have them printed on acetate (...). The idea is that each superimposed layer reflects a different dimension (orographic, hydrographic, climatic, territorial, economic, heritage, etc.). It is paradoxical that, with all the applications available on the Internet for using and creating interactive maps (...), they want to go back to the acetate, which is a word that, to me at least, sounds very old-fashioned. Instead of expanding the game options (...), it's back to the last century again. [PANO-T12]

4. Discussion and conclusions

> What is relevant is not only moving from the printed book to the use of digital tools and resources, but it is (or should be) the reflection or manifestation of a profound mutation of the pedagogical paradigm in the school, of new organisational and didactic practices in the classroom, of the development of innovative teaching processes aimed at active learning and of the reconstruction of the school culture that responds to the educational needs of the digital society. (Area Moreira, 2017, p. 17)

Assessments of the impact of technological integration processes in schools seem to be increasingly contradictory with respect to "increasing learning levels, improving educational processes, or reducing educational inequalities" (Verger and Parcerisa, 2018, pp. 67-68). The evidence found on the possible success or failure of these processes "does not provide 'recipes', but rather particularly significant interconnected factors that explain their effectiveness, highlighting the importance of adaptation to the particular context of each school" (Bartau et al., 2017, p. 97). In this sense, desirable learning outcomes depend on each context and its corresponding pedagogical, institutional, professional, organisational, cultural, familial, evaluative, etc. factors (Alderete et al., 2017; Hargreaves and Fullan, 2014; Selwyn, 2016). Without shying away from these and many other controversies (Pardo Baldoví and San Martín Alonso, 2020), the results collected here broaden the critical perspectives on technological integration, showing a vision of this phenomenon focused on a specific context and, precisely for this reason, that is different and more profound than the existing ones.

In fact, the main feature of this new view is the controversy that, as represented by the central category identified ("Technoparadojas"), generates many of the aspects associated with the incorporation of ICT in the context of our case study: the requirement to use ICT without the appropriate infrastructure or teaching provision; investment without taking into account the real needs of educational agents (Akbiyik, 2010; Gabarda Méndez, 2015; Gallardo Fernández et al., 2020); requests to design new resources without the necessary teacher training or time to do

so; etc. All this demonstrates the coexistence of quite disparate discursive positions regarding the didactic use of ICT, depending on the producer in question (legislators, the school's management team, pupils, teachers, etc.).

The official position of the legislative texts is apologetic, i.e., a staunch defence of the new resources, which are presented as "fundamental pieces" to achieve "methodological change" and, it was claimed, "the improvement of the quality of education". The concreteness of this argument did not entail any kind of warning about possible dangers or difficulties in practice. On the contrary, the new media were described as "key tools" and "revolutionary", underlining their adaptation both to the "needs and pace of each pupil" and to the interests of the "new generations". In particular, we have noticed a greater presence of ICT in the curricula of experimental subjects. In the case of Geography and History, the function for which the "intensive use" of new technologies was claimed was simply that of searching for information.

In the School's organisational texts, ICT played an even more prominent role than in the legislative texts, to the extent that innovation could not be conceived without them. It is surprising, in this sense, that ICT were conceived as ends and not as means; that is to say, as "mere 'facta', and for a utilitarian mentality this potentially implies mere blind power" (Jiménez Abad, 2015, p. 160). The main tool used was the iPad, on which the students' work depended directly. Regarding the students' abilities, the results obtained reflect serious difficulties in successfully undertaking certain tasks, especially those related to the management and maintenance of the individual portfolio, described in the laws as a "motivating tool" and in the Department's reports as a "great failure". On this point, we agree with Pallarès et al. when they state that "the social and pedagogical imaginary that has believed that educational action only needs screens has ended up generating an over-dimension of the possibilities that new technologies offer us" (2018, p. 31).

Another of the students' actions where we have been able to recognise a greater number of difficulties has been in the way of approaching the search for information to carry out research projects. Practically all students agreed on the importance of preparing a "summary" of the information found (half of them by "copy-paste"), this being the main work technique mentioned, although none of them expressed, for example, any concern about checking whether the information on the Internet is true. The portfolio and research projects are clear symptoms of the need for more specific and constant work on pupils' digital competence, with particular emphasis on the theoretical and attitudinal dimensions. In this sense, it is quite striking that the results closest to what could be considered guidelines for developing digital competence are reduced to the appearance of a set of almost anecdotal instructions in the Geography and History subject guide.

The last of the subcategories allowed us to find out what the main educational agents in our case study, the ESO pupils and the teacher-researcher, think about the impact of ICT on the teaching and learning processes. It is worth highlighting the existence of a certain rejection of the digital book by both agents, considering it to be a mere repository of the same contents as printed books, which were preferred by a large majority of pupils, as was the case with the paper notebook compared to the blog or digital portfolio. On the one hand, this is consistent with the idea that, until now, curricular materials in digital format have limited themselves to reproducing the structure of printed books, without making any substantial or original methodological contribution (Rodríguez and Area, 2017). On the other hand, the position of the participants in our research is perfectly in line with studies that reveal a certain distrust or suspicion on the part of students towards the educational use of ICT (Álvarez de Sotomayor and Muñoz Carril, 2016; Campos Martínez, 2015). This was not the case, however, in relation to exams, the digital format of which was preferred by just over half of the students interviewed. The argument of one of these students was "because it makes my hand less tired".

Finally, some of the information gathered suggests the existence of a close connection between the preference for digital, on the part of some pupils, and the observation of certain disruptive behaviours that are directly linked to the use of resources such as the iPad. In this respect, we found a vision of ICT as harmful to a profile of pupils who, in general, had more difficulties and attention problems when it came to keeping up with the pace of classes, and who, paradoxically, were the first to develop a strong addiction to the screens: "it is effectively about 'selling' educational products that can be applied to any small computer, tablet or Smartphone and thus, apart from doing business with the product, the students get used to not being able to do without the screen" (Cañadel, 2018, p. 111). It is significant that the didactic decisions involving a return to traditional formats (such as the acetate), which were imposed on teachers by the Department of Social Sciences, were not intended to provide a pedagogical response to this type of problem, but rather to maintain an educational model focused on the memorisation of conceptual content (such as, in the example shown, Geography maps).

All of this allows us to confirm the lack of correspondence between the massive presence of technology in the classroom and the quality of teaching (Pallarès et al., 2018, p. 58). As Jiménez Abad (2015) argued, there is no "strict causal relationship between a greater availability of resources and the success of academic or educational results", although, conversely, "with fewer resources, but with a proactive attitude and family support, very positive results are achieved" (pp. 174-175). In this sense, we must defend the idea that "new technologies transform the relationship with knowledge and the role of the school" (Martínez Martín and Jolonch i Anglada, 2019, p. 7). Only if there is a cultural, organisational, and methodological change, in parallel to the incorporation of such

technologies in school practices, is this the case. Although "the variables that have traditionally been related to academic performance must now be extended to include technologies, especially those that correspond to the institutional technological environment, accessibility and Internet use" (García Martín and Cantón-Mayo, 2019, p. 74), we must not forget that "cultural change does not necessarily happen at the same pace as technological innovation" (Skaftun et al., 2018, p. 42).

In the meantime, teachers will need to focus on "selecting and developing resources that support and give coherence to innovative teaching and learning methodologies" (Gros, 2019, p. 175), in order to turn their work into an effective tool for social improvement (EESC, 2014). One of the keys to this process, which is fraught with obstacles, will undoubtedly lie in the reflective and self-critical capacity that each teacher is willing to develop. The focus of interest should be clear: "it is not the technology itself, but knowing what can be done educationally with it" (Suárez-Guerrero et al., 2016, p. 87).

On the other hand, educational research must adopt a position that is as critical of innovation as it has been of tradition for a century. As exemplified by this same work, the approach of analysis strategies from an ethnographic-discursive approach can be particularly useful in this regard. After all, current educational discourses are responsible for carrying a set of meanings, convincing in form, but hardly sustainable in content, at least as the school contexts are still articulated. The challenge we propose is to continue to broaden our critical and self-critical look at educational technologies and innovative discourses in general, comparing the results of our case study with new cases and educational contexts, as long as the voices of the real protagonists are placed on the same level as other types of discourses.

5. Note

This text is part of the PhD project entitled "The impact of innovative fashion in Secondary education. The Geography and History class as a case study", defended at the University of Seville in 2022.

References

Adams, T. E., Jones, S. H., & Ellis, C. (2015). *Autoethnography*. Oxford University Press.

Akbiyik, C. (2010). ¿Puede la informática afectiva llevar a un uso más efectivo de las Tecnologías de la Información y de la Comunicación (TIC) en la Educación? *Revista de educación*, 352, 179-202.

Alderete, M. V., Di Meglio Berg, G. A., & Formichella, M. M. (2017). Acceso a las TIC y rendimiento educativo: ¿una relación potenciada por su uso? Un análisis para España. *Revista de Educacion*, 377, 54-79. http://dx.doi.org/10.4438/1988-592X-RE-2017-377-353

Area Moreira, M. (2010). El proceso de integración y uso pedagógico de las TIC en los centros educativos. Un estudio de casos. *Revista de Educación*, 352, 77-97. http://www.revistaeducacion.educacion.es/re352/re352_04.pdf

Area-Moreira, M., Hernández-Rivero, V., & Sosa-Alonso, J. J. (2016). Modelos de integración didáctica de las TIC en el aula. *Comunicar*, 47, 79-87. https://doi.org/10.3916/C47-2016-08

Area Moreira, M. (2017). La metamorfosis digital del material didáctico tras el paréntesis Gutenberg. *Revista Latinoamericana de Tecnología Educativa-RELATEC*, *16*(2), 13-28. https://doi.org/10.17398/1695-288X.16.2.13

Bartau, I., Azpillaga, V., & Joaristi, L. M. (2017). Metodología de enseñanza en centros eficaces de la Comunidad Autónoma del País Vasco. *Revista de Investigación Educativa*, *35*(1), 93-112. http://dx.doi.org/10.6018/rie.35.1.225141

Beckman, K., Bennett, S., & Lockyer, L. (2014). *Understanding students' use and value of technology for learning*, *39*(3). https://doi.org/10.1080/17439884.2013.878353

Bhargava, R. (2009). Manifesto for the content curator: The next big social media job of the future. https://rohitbhargava.com/manifesto-for-the-content-curator-the-next-big-social-media-job-of-the-future/

Campión, R. S., Navaridas Nalda, F., & Reparaz Abaitua, C. (2014). La escuela 2.0: la percepción del docente en torno a su eficacia en los centros educativos de La Rioja. *Educación XX1*, *17*(1), 243-270.

Campos Martínez, J. A. (2015). Lo cotidiano (entre usos y resistencias) de las TIC en un aula de Educación Secundaria Obligatoria. *Antropología Experimental*, *0*(15), 567-580.

Cañadel, R. (2018). El asalto neoliberal a la educación. *Con-Ciencia Social (segunda época)*, *1*, 103-117. https://dialnet.unirioja.es/descarga/articulo/6660374.pdf

European Economic and Social Committee (EESC) (2013). "Communication from the Commission to the European Parliament, The Council, The European Economic and Social Committee and the Committee of the Regions: *Opening up Education: Innovative teaching and learning for all through new Technologies and Open Educational Resources*", (COM(2013) 654 final, 25.9.2013).

Ellis, C. (2016). *Revision. Autoethnographic reflections on life and work*. Routledge.

Erstad, O, Gilje, Ø., & Arnseth, H. C. (2013). Vidas de aprendizaje conectadas: jóvenes digitales en espacios escolares y comunitarios. *Comunicar*, *20*(40), 89-98. https://doi.org/10.3916/C40-2013-02-09

European Commission (2019). 2nd survey of schools: ICT in education: objective 1: Benchmark pro-gress in ICT in schools, final report. https://data.europa.eu/euodp/data/storage/f/2019-03-19T084831/FinalreportObjective1-BenchmarkprogressinICTinschools.pdf

Fairclough, N. (2003). El análisis crítico del discurso como método para la investigación en ciencias sociales. En R. Wodak, & M. Meyer (comps.), *Métodos de análisis crítico del discurso* (pp. 179-204). Gedisa.

Gabarda Méndez, V. (2015). Uso de las TIC en el profesorado europeo, ¿una cuestión de equipamiento y formación? *Revista española de educación comparada*, 26, 153-170. https://doi.org/10.5944/reec.26.2015.14448

Gallardo Fernández, I. M., De Castro Calvo, A., & Saiz Fernández, H. (2020). Interacción y uso de tecnologías en los procesos de enseñanza y aprendizaje. *Educatio Siglo XXI*, *38*(1), 119-138. http://dx.doi.org/10.6018/educatio.413441

Gros, B. (2019). La innovación en los entornos y materiales de aprendizaje. En M. Martínez Martín y A. Jolonch i Anglada (Coords.), *Las paradojas de la innovación educativa* (pp. 175-196). Horsori.

Hargreaves, A., & Fullan, M. (2014). *Capital Profesional*. Morata.

Jäger, S. (2003). Discurso y conocimiento: aspectos teóricos y metodológicos de la crítica del discurso y del análisis de dispositivos. En R. Wodak, & Meyer, M. (comps.), *Métodos de análisis crítico del discurso* (pp. 61-100). Gedisa.

Jiménez Abad, A. (2015). Motivación docente y factores impulsores de la innovación. En Jiménez, L. (Dir.), *Innovación educativa y tradición* (pp. 155-180). Fundación Universitaria Española.

López Flamarique, M., Egaña, T., & Garro Larrañaga, E. (2019). Búsqueda, evaluación y selección de información digital en un aula de secundaria: Tensiones entre la práctica y el discurso del profesorado y el alumnado. *Digital Education Review*, 36, 36-50. https://doi.org/10.1344/der.2019.36.36-50

Mama, M., & Hennessy, S. (2013). Developing a typology of teacher beliefs and practices concerning classroom use of ICT. *Computers & Education,* 68, 380-387. https://doi.org/10.1016/j.compedu.2013.05.022

Manzanares Triquet, J. C. (2020). Generación Z y gamificación: el dibujo pedagógico de una nueva sociedad educativa. *Tejuelo*, 32, 263-298. https://doi.org/10.17398/1988-8430.32.263

Martínez Martín, M., & Jolonch i Anglada, A. (Coords.) (2019). *Las paradojas de la innovación educativa*. Horsori.

Mertler, C. A. (2017). *Action research: improving schools and empowering educators*. SAGE.

Mitra, R. (2010). Doing ethnography, being an ethnographer: The autoethnographic research process and I. *Journal of Research Practice*, *6*(1), M4. http://jrp.icaap.org/index.php/jrp/article/view/184/182

Montero, L., & Gewerc, A. (2010). De la innovación deseada a la innovación posible. Escuelas alteradas por las TIC. *Profesorado. Revista de Currículum y Formación del Profesorado*, *14*(1), 303-318.

Morrison, J., Ross, S. M., & Corcoran, R. P. (2015). Do teachers and students get the ed-tech products they need: The challenges of ed-tech procurement in a rapidly frowing market. *World Journal on Educational Technology*, *7*(1), 63-86. https://doi.org/10.18844/wjet.v7i1.25

Neufeld, P., & Delcore, H. (2018). Situatedness and Variations in Student Adoption of Technology Practices: Towards a Critical Techno-Pedagogy. *Journal of Information Technology Education: Research, 17*(1), 1-38. https://www.learntechlib.org/p/182204/.

Pallarès, M., Chiva, Ó., López, R., & Cabero, I. (2018). *La escuela que llega: tendencias y nuevos enfoques metodológicos*. Octaedro.

Pardo Abril, N. G. (2013). *Cómo hacer análisis crítico del discurso. Una perspectiva latinoamericana*. Universidad Nacional de Colombia.

Pardo Baldoví, M. I., & San Martín Alonso, Á. (2020). Tecnologías y cultura organizativa en los centros escolares. ¿La uberización de las relaciones laborales? *Pixel-Bit: Revista de Medios y Educación*, 58, 161-179.

Pini, M. (Comp.) (2009). *Discurso y educación. Herramientas para el análisis crítico*. UNSAM EDITA.

Rodríguez, J. R., & Area, M. (2017). De los libros de texto a los materiales didácticos digitales. *RELATEC: Revista Latinoamericana de Tecnología Educativa*, *16*(2), 9-12.

Selwyn, N. (2016). *Is Technology Good for Education?* Polity Press.

Skaftun, A., Igland, M-A., Husebø, D., Nome S., & Nygard, A. O. (2018). Glimpses of dialogue: transitional practices in digitalised classrooms. *Learning, Media and Technology*, *43*(1), 42-55. https://doi.org/10.1080/17439884.2017.1369106

Starr, L. (2010). The Use of Autoethnography in Educational Research: Locating Who We Are in What We Do. *Canadian Journal for New Scholars in Education/ Revue canadienne des jeunes chercheures et chercheurs en éducation, 3*(1), 1-9.

Strauss, A., & Corbin, J. (2002). *Bases de la investigación cualitativa: Técnicas y procedimientos para desarrollar la teoría fundamentada*. Editorial Universidad de Antioquía.

Suárez-Guerrero, C., Lloret-Catalá, C., & Mengual-Andrés, S. (2016). Percepción docente sobre la transformación digital del aula a través de tabletas: Un estudio en el contexto español. *Comunicar*, 49, 81-89. https://doi.org/10.3916/C49-2016-08

Verger, A. & Parcerisa, Ll. (2018). Globalización, rendición de cuentas y gobernanza educativa. Análisis de un fenómeno en expansión. *Con-Ciencia Social* (segunda época), 1, 59-73.

Wamsted, J. O. (2012). Borges y Bikes Riders: Toward an Understanding of Autoethnography. *Qualitative Research in Education*, *1*(2), 179-201. http://dx.doi.org/10.4471/qre.2012.09

Wodak, R., & Meyer, M. (comps.) (2003). *Métodos de análisis crítico del discurso*. Gedisa.