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Decoding digital education notions and encoding critical thinking, human rights and participation for fairer digital societies

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Abstract

This research explores descriptions of the educational digital divide in the context of surveillance capitalism, focusing on the concentration of knowledge and power over behavioural control. This gap has expanded the field of digital rights in the last decade and was accelerated with the COVID-19 brutal digital transformation. Advancing democracies in the digital age entail comprehensive efforts oriented by human rights including technologies, regulations, research and education. Knowledge in digitised societies has been fundamentally affected by what Zuboff defined as a stark 'division of learning', the axial point for the financial interest of big tech companies and governments. This study applied Systematic Literature Review to provide a broad overview of digital education's key features, its contextual factors and elaborations around critical thinking, rights and participation. The exploratory analysis covered 66 peer-reviewed articles published in English after 2014. Results problematised dominant understandings for being mainly dedicated to blending digital technologies with traditional learning, minimally including the growing concerns from digital rights, and emphasising efficient educational management. Repairing this was grounded on a critical digital education decoding the social, political and environmental impacts and collectively encoding the common good.

Keywords: digital education, systematic literature review, digital rights, human rights

Introduction

This article analyses the knowledge, skills and values to understand digital technologies and its associations with critical thinking, human rights and participation. To this end, it reflects upon dominant digital education notions with a comprehensive academic literature review and provides an overview on how these dimensions have been addressed so far. A Systematic Literature Review (SLR) was applied among 66 articles in an exploratory effort to foreground digital education's broad advancements and shortcomings. The sample considered peer-reviewed texts in English, published after 2014, available to download, and referencing "digital education" in the title and the abstract. The article exclusion criteria considered publications' time threshold was considered due to timely contextual factors enhancing the global awareness on digital and human rights. It also excluded articles which did not have a direct focus on digital education, that were not published in academic journals or not available in English language. Three main analytical themes emerged: digital education's key features, its underpinning factors, and references to key dimensions of critical digital education.

The relevance of this research pertains to a steep rise of the field human rights and digital technologies ('digital rights'). Visions of social development and digital technologies have been expressed since the 2000s with the expansion of the internet (Castells, 2000). However, key events from the last two decades and particularly in the United States and European level, have actioned debates around the implications of digital societies for democracy and human dignity (Goddard, 2017; Kuner, 2020: RightsCon, 2023a). Upon recommendations from international organisations, education has been consistently recognised as instrumental to progress rights and freedoms (UN GA, 2020). Nevertheless, advances in the right to a quality education in the digital age has been lightly considered in advocacy arenas (Magnone, 2022). This absence has been reinforced by an educational gap represented by Zuboff (2019) as a 'division of learning', the axial principle of the consolidated age of 'surveillance capitalism'.

This minimal engagement of educational agendas with the wide array of digital rights debates intensifies the global social inequality crisis. This is due to the concentration of knowledge and behavioural control in the interest of few tech companies and governments. This predominance of market-driven values became evident in international reviews of educational frameworks. Across regions, curriculums have overly promoted teaching *with* digital technologies and elevating skills for tech's economic and labour market (Law et al., 2018). A balanced digital education encompasses aspects of teaching and learning *with and about* the digital infrastructures. Furthermore, a digital education to manifest fairer societies elevates a critical consciousness and collective emancipatory solutions (Emejulu & McGregor, 2019).

This study contributes to discussions on the implications of privileged digital education notions, key factors rendering a disconnect between digital rights and academia, and ways to repurpose this education towards social justice. This research builds upon efforts from the JAAKLAC[1] initiative

1 JAAKLAC is an acronym composed of words that represent our values in various languages of the Latin American community. We remixed the English word "hack", establishing it in Castilian as "jak". "JAAKing" happens when diverse communities come together in solidarity to orchestrate and develop digital technologies for the common good and environment. We give new meaning to the acronym LAC, commonly used for Latin America and the Caribbean, by focusing on solutions centred on free societies. More information on the acronym: https://jaaklac.org/principios/

(Magnone, 2022), which I lead, to research and advocate for Critical Digital Education (CDE) and youth participation. Jaaklac bridges knowledge gaps because of academia's consistent exclusion of overlooked groups and especially from Latin America and the Global Majority (the 'Global South'[2]). The CDE practices are based on horizontal dialogue and collectively implementing workshops, blogs and podcasts. These are meant as accessible means to research, learn and participate in the knowledge production.

Background

Digital technologies are highly entwined with different aspects of social life, shaping individuals' realities and lifelong development. Positive connections between digital technologies and social development have been elaborated since the online expansion with the turn of the New Millenia. Visions of 'networked' and 'information societies' became self-fulfilled prophecies facilitated by recommendations from international agencies and tech experts to build a digital superhighway (Castells, 2000). Such myopic drive took a turn in 2010, when the United Nations' (UN) began to more strongly reference human rights in connection to internet access. This rendered especially after social media censorship and internet blackouts during the so-called 'Arab Spring' by authoritarian states in the Middle East and North Africa (La Rue, 2014). Abuses from digital platforms were realised to prevail in Western geographies as well, with the United States (US) and other powerful governments digital oversight worldwide, evidenced by the 2013 'Snowden revelations' (Von Solms et al., 2015). Ever since, "digital rights are human rights" became an advocacy mantra, and especially since the COVID-19 brutal digital transformation.

Notwithstanding, educational systems have minimally promoted a critical consciousness about the digital age, its effects on human rights and a participation to materialise better pathways. Key milestones, mostly reinforcing concerns in Europe and the US, have motivated discussions around digital education and rights. These have particularly regarded events after 2015, such as when the European Union (EU) agreed on the Paris Declaration to coordinate efforts on security, democracy and social justice in relation to digital technologies. Agreements stemmed from terrorist attacks fuelled by anti-immigrant, racist hate speech and youth radicalisation within digital platforms by the far-right and Islamic State groups (Frau-Meigs et al., 2017). Furthermore, globally influential geographies have been uneasy with electoral security. Main milestones were the British referendum to exit the EU and Trump's US presidential election, and the use of social media to personalise advertising and misinformation ('fake news'). In light of these restrictions to privacy and other fundamental rights, in 2015 the EU adopted the General Data Protection Regulation. GDPR has influenced policies internationally due to the power of Europe and interconnectedness

2 This study acknowledges non-binary conceptualisations of the Global Majority, defined through time as 'Global South' or 'Third World' as well. The GM represents systematically disadvantaged groups which not necessarily narrow upon geographies. For example, with traditional economic elites delving in Latin America, Africa or the Middle East, and modern slavery affecting Europe and North America to force labour that acutely affects specific ethnic and racial groups.

of digital markets. These data protection legal instruments have been expanded, for example, to regulate automation and prediction with Artificial Intelligence (Goddard, 2017; Kuner, 2020).

Meanwhile, debates over child rights online surged since 2015 as well, under global reports of one third of individuals online being under 18 years old. Scholars dedicated to this topic have pointed at the minimal engagement of internet governance agendas with the UN Convention of the Rights of the Child (CRC), one of the most broadly ratified international agreements (CRC, 2021; Nawaila et al., 2018; Livingstone & Bulger, 2014). Issues of child privacy have grown exponentially with a market for 'parental control', 'edtech' and schools' Learning Management Systems (LMS), online advertisements and digital welfares (Barassi, 2020; Hope, 2018). In light of this, children's right to participation has been pinpointed as instrumental to guarantee their freedoms and best interest (Third et al., 2014). Policies have been problematised in tension between adult, child rights and magnified moral panics. Such has been the case of EU laws banning message encryption on social media to address Child Sexual Abuse Material (EDRi, 2023).

Among integral solutions, the UN has proposed international digital cooperations, cross-cutting actors and disciplines (UN GA, 2020). Notwithstanding, digital policies have heavily relied on the corporate tech sector's dominance of digital access to open up markets to collect information and predict society. Meanwhile, civil society and activists from around the world have picked up the pieces of the casualties from the digital transformation. The magnitude of this context was observed at RightsCon 2023, the biggest international digital rights conference, which amounted its largest number of proposals in more than a decade (RightsCon, 2023a). Topics included affordable access, racial discrimination, gender-based violence, journalist and activist surveillance, migrant border control, and the environmental crisis, among other. However, instrumentalising solutions through the right to a quality education has been disregarded in the digital rights space. At the same time, educational landscapes have had minimal overlaps with the wealth of concerns around digital rights (Magnone, 2024).

Grounding theory: Digital divides in education

Among theories making sense of these contextual factors were Zuboff's (2019) references to a 'division o learning' in her book "The Age of Surveillance Capitalism", a publication that resonated widely across audiences. In her timely book, Zuboff describes events and strategies from persistent misuses and abuses by wealthy tech companies and governments. Her research signalled the instrumental role of education and its relation with behavioural control as she underscored the questions: *"who knows, who decides, and who decides who decides?"* (p.174). This digital divide in knowledge was argued to be consequential of few corporations mining information about individuals, the environment, and with decisions driven by financial interest. Thus, shifting power implies strategies balancing responsibilities across stakeholders (governments, companies, civil society and international agencies), for which digital education has an instrumental role (Magnone, 2021).

Educational models questioning the advances and challenges of the digital age encompass teaching and learning *with and about* digital technologies (Emejulu & McGregor, 2016). The significant gaps in digital education were evidenced during the COVID-19 pandemic, which represented for many students and teachers from around the world their first online learning

experience. Previously, international reviews of educational frameworks had confirmed these uneven and insufficient advances globally, almost exclusively focussed on using digital technologies. Moreover, guidelines so far had mostly recommended developing skills for the digital economy and labour markets, with scarce and neutral reflections on how digital technologies affect society (Law et al., 2018).

Unbalanced advancements in digital education have been fuelled by different factors related to a 'knowledge economy'. Educational technology ('edtech') has flourished as a billion dollar sector. Digital technologies have facilitated educational access, self-paced and outside schools, with a growing number of platforms and solutions including tutors and social media communities. Educational institutions have been through a digital change either for learning and for administrative tasks. This process has nurtured a wealth of insights valued as the new raw material for economic imaginaries, such as the 'data economy' and '4th industrial revolution'.

The scattered progress in digital education has been also affected by frameworks elaborated by companies and experts under competing, yet similar, concepts. Guidelines have elaborated on competences to harness the dynamic innovations ever emerging and its associated social phenomena. Ideal digital behaviours or embodiments have been described under notions such as 'media and information literacy', 'internet literacy', '21st century skills', and 'digital citizenship'. Setting a common ground around these terms has actioned a body of literature reviews and concept analysis (Van Laar et al., 2017). For instance, 'digital literacy', among most popular concepts, was identified to represent a "plurality of terms" with difficulty to observe differences among them (Audrin & Audrin, 2022). Likewise, a concept analysis of 'digital citizenship', finding a significant number of papers using the term as a synonym for 'media and information literacy' (Choi, 2016).

In this regard, digital education has brought about promises of innovation, greater engagement with students and optimising learning trajectories. Yet, it has actioned questions about its economic interest and surveillant approaches, and its implications for education, freedoms and democracy (Selwyn, 2015; Williamson, 2019). The prolific edtech sector has been particularly problematised for ignoring and obscuring debates around the social, political, economic and environmental implications of the digital age. Digital education has narrowed upon individuals' responsibilities, cherry-picking references to rights and a social behaviour to maintain the status quo uncontested (Magnone, 2019).

An education to repair unbalanced approaches has been described as a *"praxis through which individuals and groups: (1) critically analyse the social, political, economic and environmental consequences of technologies in everyday life; (2) collectively deliberate and take action to build alternative and emancipatory technologies and technological practices"* (Emejulu & McGregor, 2016, p. 1).

This standpoint realises the relevance of unpacking digital societies and of community actions for a material change.

Building upon this research's contextual factors and grounding theory, three competencies were identified as fundamental and interconnected: *critical thinking, human rights and participation*. The first regards to a consciousness around the political, social, economic and environmental implications of digital technologies (Facer, 2011). In relation to this, international agreements such as the UN Declaration of Human Rights and CRC covers a wide range of issues for social

development in digital societies. The overarching concept of participation for this study entails engaging in collective solutions against oppressive structures that encode reflections forwarding social justice.

This research problematises advances and drawbacks in these areas by looking at digital education's features using a SLR. Its relevance pertains to divisions of learning constraining rights and freedoms in digital societies. Unbalanced outlooks to understand digital technologies have been related to various issues. Among these stand out the financial drive of wealthy tech companies and governments and a competitive educational field within a growing knowledge economy.

Research questions and methodology

The research questions were: (a) which contextual factors drive digital education notions?; (b) which are the dominant features associated with digital education?; and (c) how are critical thinking, human rights and participation represented within these notions?. A SLR was used to have an overview analysis of patterns in digital education among peer-reviewed journals published in English after 2014. This timeframe was considered due to the milestone events described in the background section and its effects on educational agendas. The research process was divided into (1) data selection, determining relevant journal databases and keywords to retrieve the information; (2) data extraction, downloading articles and collecting information in a spreadsheet for the selection process; and (3) data analysis, elaborating a codebook, surveying the articles' corpus with it and systematising findings oriented by the research questions, theory and background.

This study is a broad and exploratory outlook on gaps, advances and implications of the divisions of learning that currently define digital societies. The scope of this SLR results from this research's available time and resources. These have mainly limited this research's inclusion of non-academic texts, in languages different than English, and its deeper text analysis with more advanced features the Atlas.ti software. Issues of language and non-academic publications particularly constrain social justice in the knowledge production, by mostly excluding native populations. Composing this study with Latin American languages (such as Spanish, Portuguese and indigenous) could have allowed a wider perspective to build upon Jaaklac's CDE. In this sense, this study is an invitation for further researchers to make sense of the state of the art of teaching and learning about digital technologies and collective solutions for better digital futures for all.

This SLR strategy was rooted on the significance of shedding light over a 'messiness' often found in different scholarly fields (Boland et al., 2017; Zawacki-Richter et al., 2020). This is achieved by reviewing literature through a rigorous plan, process and analysis facilitating the replication and assessment of the resulting analysis. Thus, its forte has been related to minimising the researchers' biases when selecting relevant literature and openly displaying its logics. Other benefits that have been pointed result in summarising information, making it accessible for different actors, and facilitating fresh contributions. Among literature review methodologies, this study was based on a "Preferred Reporting Items for Systematic reviews and Meta-Analyses" (PRISMA). Nevertheless, PRISMA's most significant limitations regard not being designed using its

own SLR process and having an outlook mainly from the natural sciences and medicine (Liberati et al., 2009).

Data selection

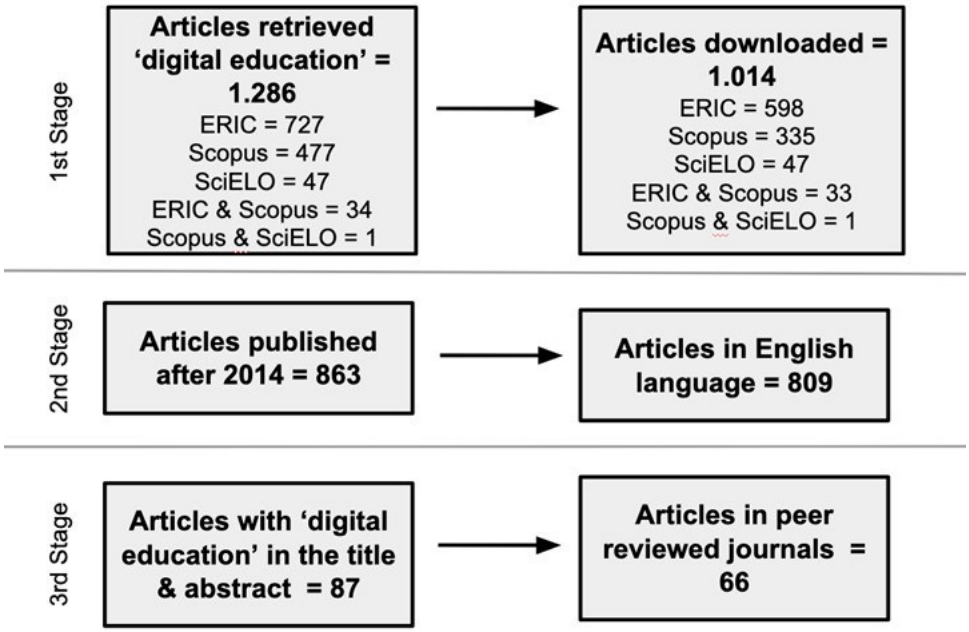
The electronic databases Scopus, ERIC and SciELO were determined respectively for its comprehensiveness and significance in different academic fields, its dedication to educational practices, and its relevant Latin American scope. Several search strings were considered initially, such as “digital education”, “digital education AND critical thinking”, “digital education AND human rights” and “digital education AND participation”. However, using only the “digital education” string was determined to provide more a more relevant and effective focus.

Data extraction

All articles were retrieved systematically and information about these was coded into a spreadsheet, including key variables to calibrate the selection. These included the year of publication, language, peer-reviewed journal, mentions to ‘digital education’ in the articles’ title and abstract, download availability and access link. The exclusion criteria considered articles available to be downloaded, published after the 2014, in English language, available in peer-reviewed articles, and texts that were found to be repeated across journal databases. Figure 1 provides a flowchart depicting the process and number of articles after each exclusion criteria, which rendered into 66 articles. An overall total of 1.286 articles were retrieved between August and October of 2022 for ERIC and Scopus, and in June of 2024 for SciELO. These represented 727 from ERIC, 477 from Scopus, 47 in SciELO, 34 featured in both ERIC and Scopus, and 1 in Scopus and SciELO. Articles that were found in more than one database were 13, 12 were cross published in Scopus and ERIC.

Figure 1:

Data collection flowchart process to retrieve and select articles:



Data analysis

The analysis blending deductive and inductive iterations to identify thematic patterns prevalent in academic research. This allowed the analysis to be flexible and channel emerging topics, not necessarily identified in advance. Content analysis can be used through deductive, inductive or abductive classifications. The first derives from scientific theories, the second from empirical data, and the third from possible explanations stemming from observations. Academic research has been noted to generally integrate the three it its reasoning proceedings (Szabó et al., 2024). For this research, the deductive approach was firstly driven by theory, with key themes and sub-themes elaborated in a codebook based on the research questions, context and theoretical framework. Secondly, an inductive stage was actioned during the coding process, resulting in the adjustment of the codebook according to findings from the 66 articles. After this, a new codebook version was used to tag the full articles using the software Atlas.ti. At last, a new codebook calibration was implemented and used to survey all the articles for a final full text analysis. In both deductive and inductive processes, examples of similar terms and keyword strings were listed for each sub-category for better orientation.

The codebook (see Table 1) included the categories a) 'context', which sub-codes pertained to references of digital transformation, its effects in the educational field and expansion during COVID-19 pandemic; b) 'features', identifying key features associated to digital education notions, such as blended or hybrid learning, cost-effectiveness, innovation, creativity and engagement; and finally, the c) 'about education' category which looked up references to topics around understanding technology and agency over it, through critical thinking, rights and participation.

Table 1:
Codebook summary and brief examples of associated keywords and strings

A. Context	B. Features	C. About Education
Digital transformation: Revolution, change, 4th industrial revolution.	*Blended:* Hybrid, synchronous/asynchronous, online/offline, virtual vs corporeal, disembodied digitality, traditional vs digital	*Critic*al: problem solving, making informed decisions, making sense of digital tools, self reflective inquiry, curiosity, self-assessed.
Digital demand in Education: Pervasiveness of digital education tools in education, push and pull factors.	*Cost effectiveness:* Efficiency, measurability, automated, unproductive, shortage of teachers and professionals, personalisation.	*Rights:* digital poverty, emancipatory, social justice, protection, accountability, techno optimism, human-centred, ethical.
COVID-19: Digital education experiences and preparedness for future crises.	*Innovate, Create, Engage*: Emergent, invention; re-shape, (re) imagine, constructive; co-design, student centred, out of touch.	*Participation: Inevitability, powerlessness, agency, resistance, community, governance.*

Results

This section is structured by the research questions containing the main outputs around digital education's understandings, its relevant features and associated contextual factors. The final section contains the main takeaways from observing the digital education articles' references to critical thinking, human rights and participation. The analysis was mostly exploratory, using Atlas.ti to identify the frequency in references to the topics, identify and systematise emerging issues. A broader network of scholars are invited to provide more diverse and in depth perspectives to this grounding effort with the 66 articles so far listed in the Appendix.

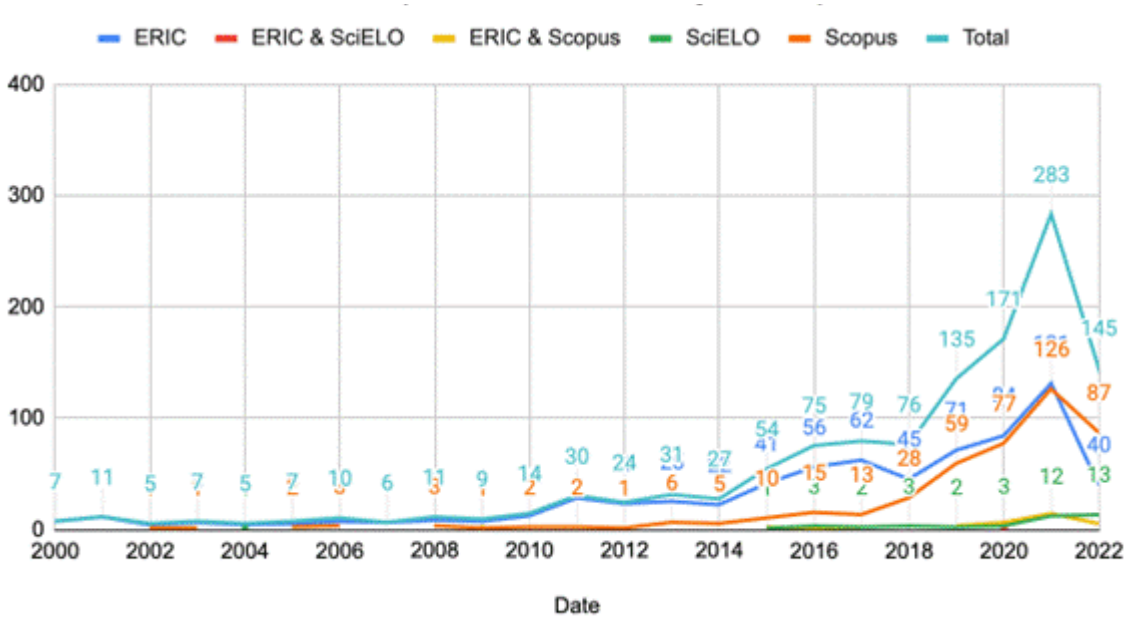
Contextual factors driving digital education

Among most relevant findings of this SLR was the confirmation of the significance of the 2014 events described in the background section. Its effects on the educational field was observed in the increase in articles published since that year (see Figure 2). The 2022 decrease was expected

to change as the articles analysed were mostly retrieved by October of that year. The distribution of registered publications was contemplated to express similar patterns for cousin umbrella terms, such as digital competences or digital literacy. Notwithstanding, a second important finding was that greater attention to digital education missed direct references to the issues of human rights and democracy described in this research background. Furthermore, most of the research scope was framed within higher education systems, resulting in a wide disregard on issues related to children and adolescents.

Figure 2:

Total articles retrieved per year of publication and database



Key phenomena referenced within the articles were related to digital transformation, demands of digital education in relation to this and its acceleration during the COVID-19 pandemic (see Table 2). Observations around society's changes due to tech developments were present in 44% of the articles, especially connected to the labour market. The effects of this phenomenon on education to, for instance, upskill the workforce or leverage teaching and learning practices, was observed in 35% of the articles. The COVID-19 pandemic was mentioned in 33% papers, as those with the possibility turned into online learning due to lock downs and school closures. The global health crisis was a school of velocity for online teaching and learning, therefore, the scholarly field expanded significantly.

Table 2:

Distribution of articles referencing at least one of the Context sub-categories DigitalTransformation, Digital Education Demand and COVID-19.

A. Context	N	Percentage
Digital Transformation	29	44%
Digital Education Demand	23	35%
COVID-19	22	33%
Sub-total*	43	65%
Total	66	100%

* Articles containing at least one Context sub-theme

Digital technologies were presented as in dynamic development that at the same time affect processes in education. This actioned reflections on the ways in which both teaching and learning are being affected within a more multi-dimensional and complex process (González-Zamar, et al., 2020). Shifts in the educational sector are described as well, and particularly universities, in terms of curriculum and learning results. This educational transformation was observed as cross-disciplinary with remote and hybrid learning practices (Makhachashvili & Semenist, 2021).

The catalyst factors identified pointed to the dawn of a new era by digital technologies tightly entwining these with education, the labour market and the economy. These were represented under concepts such as the 'knowledge economy', 'industry 4.0' and 'web 4.0' (Bayne & Gallager, 2021; Makhachashvili & Semenist, 2021; Gopal, 2020). This demand for digital education is described to be threading through sectors, framed by trends in globalisation and capitalism. Some of the main issues mentioned were process automation, ease for informational access, and the reduction and broadening of the labour market. Finally, it described how the internet has facilitated learning outside formal spaces, such as schools and libraries.

Digital education notions and key features

Analysing direct definitions among the 66 articles, 54 used 'digital education' as a keyword and 20 directly described it within the text. This general lack of delineation of what digital education means became less clear with the use of similar umbrella terms interchangeably, without even delving into differences among them. Confirming and addressing this problem, several articles pursued endeavours similar to this study to decode digital education's understandings. Among some of the synonyms used in the reviewed articles were 'internet literacy', 'digital competences', '21st century skills', 'media literacy' and 'digital citizenship'. Revisions of digital education frameworks also identified the using digital technologies within traditional learning approaches,

yet allowing more flexible and personalised practices between on and offline activities around students' needs:

> "Digital education is an umbrella term for various teaching approaches that involve a multitude of concepts, methods, and technologies (Car et al., 2019). Digital education designs are commonly termed blended learning; they combine digital online learning and in-person learning activities or fully apply distance learning (asynchronous or a combination of asynchronous and synchronous learning) on various application platforms and software." (Ødegaard et al., 2022, p.1).

Variations in digital education notions shifted depending on the sense-making of how digital tools can be appropriated by schools and societies. These described a meaningful use and visions around the purpose of digital technologies. Three key features stood out (see Table 3) among digital education's notions: 'Blended' (in 65% of the articles), describing the use of digital technologies for distance, e-learning or hybrid formats; 'Cost-effectiveness' (in 73% of the articles), about the optimisation of different resources and the possibilities to expand education and professional actualisation; and 'Innovate, Create and Engage', (with 71% of the articles) reflecting on these aspects to develop a new digital culture, for self-regulated learning, outside conventional or in-person classes.

Table 3:

Distribution of articles referencing at least one of the Features sub-categories Blended, Cost-effectiveness, and Innovate, Create, Engage.

B. Features	Number	Percentage
Blended	43	65%
Cost effectiveness	48	73%
Innovate, Create, Engage	47	71%
Sub-total	64	97%
Total	66	100%

* Articles containing at least one Features sub-theme

Analysing key features of 'digital education' denoted a special reference to teaching and learning *with* digital technologies. Articles consistently referred to hybrid or blended formats, beyond schools' physical spaces, traditional learning structures and even offline. This digital orchestration was diverse, covering tools such as mobile phones, Virtual Reality, digital whiteboards and high fidelity dummies (Dunleavy et al., 2019). The flourishing of hybrid environments motivated comparisons between digital and traditional strategies, yet often times with non-conclusive evidence. The 'validity' of digital education was informed by dimensions of precision, often times around data collection, measurability, learning analytics, personalisation and prediction. Its great value had an outlook for optimising resources, while bettering content access, school management and academic trajectories. These have been problematised such as with data

inferring that only 2% of e-learning students from Coursera had finalised their courses (Soroka, 2020).

Digital education's key features pertained also to novel problems identified with blended environments. Negative effects analysed were students' isolation, interactions and wellbeing, elaborating on experiences to bypass some of these with creativity, engagement and innovation. This was mostly observed among the literature since the COVID-19 online learning, with examples of online meeting fatigue and alienation. Solutions recommended nurturing social relations with leadership to co-design and network, building upon motivation, hope and positive connections. Futures imaginations and creativity were also referenced in maker and other experiential or project-based learning (González-Zamar, et al., 2020). Finally, note that most of the articles' scope was higher education, some belonged to medicine (around staff training and bettering of patients' treatments), and younger generations or individuals with easier digital cultures to socialise and learn online.

About education: critical thinking, human rights and participation

The final research question zoomed into digital education's specific features fostering the critical understanding of digital technologies and collective actions towards social justice. This was instrumentalised by analysing keywords connected to digital education notions in regards to critical thinking, human rights and participation. The sub-categories were labelled as "Critical", "Rights" and "Participation", specifically problematising: critical towards what? which human rights? and participation for what?

Table 4:

Distribution of articles referencing at least one of the About Education sub-categories Critical, Rights and Participation.

C. About Education	Number	Percentage
Critical	30	45%
Rights	43	65%
Participation	28	42%
Sub-total	53	80%
Total	66	100%

* Articles containing at least one About Education sub-theme

References to the three sub-themes were identified in almost all of the articles (80%), 45% on critical thinking, 65% on human rights, and 42% on participation. The excerpts exemplify knowledge, skills and values to make sense of digital technologies. Fostering an understanding of the effects of digital technologies remained mostly excluded. Critical thinking mainly decoded

digital education's effectiveness, challenges and opportunities for blended formats. One article in particular highlighted the ways in which emerging technologies in digital education are those which have not been more comprehensively analysed. In this sense, embracing this "not-yetness" regards constantly making sense and contesting digital technologies' potential to improve and deter education (Ross, 2017, p. 214).

The effects of digital technologies more socially and politically informed were broadly scarce, with few direct mentions to 'human rights' or 'rights'. However, more than half of the articles identified barriers to unroll digital technologies, such as digital poverty, accessibility and inclusion, in relation to language, affordability, free and openness. These were especially associated with women, rural populations, disadvantaged groups, and geographies from the so-called 'global south'. Issues of security, wellbeing, safety, protection, control and surveillance were minimally referred. Frameworks from international agencies and standards for process quality assessment to keep actors, across sectors, accountable with principles of transparency steered by social responsibility and the common good. This has been referenced around schools' accountability on their social and environmental effects and building skills for community participation (Zhao et al., 2022)

In regards to the articles' references the 'environment' and 'ecosystem', in most cases referred to the multiple components to run and orchestrate digital technologies to learn. These included using and combining platforms, stakeholders, subjects and disciplines (Dillenbourg, 2016). References to environmental issues included within the "Rights" sub-theme were observed in 4 articles mentioning ways to harness tech to tackle the environmental crisis or to minimise its negative implications (Kohler et al., 2022; Zhao et al., 2022). Complementing this, 2 articles were centred on social responsibility and the role of digital technologies affecting the environment and processes to bring about solutions (Emejulu & McGregor, 2016).

For the purpose of this study, participation was differentiated from engagement by channeling social and political issues. In the analysed articles, issues were addressed about governance among schools, teachers and students. Notwithstanding, 'participation' or 'agency' was in most cases contradicted, for instance, by foregrounding dimensions of 'automation', 'management' and 'inevitability'. These were connected with opportunities of data collection, personalising educational trajectories and optimising resources. The implications of this digital transformation to the integrity of education remained highly unquestioned. This was reinforced with low frequency of references to privacy, protection and freedoms. Finally, fewer articles addressed a digital education for advocacy, activism and to re-claim technology, for example, contesting digital surveillance and control, within or outside schools.

Overall, it was observed a significant lack of discussions on teaching and learning *about* the wealth of implications of digital societies exposed in the growing field of digital rights. Filling this gap has been stressed as relevant in the context of future university developments "imposed" and with scarce control within an increased market-driven, digitalised and datafied education. In this sense, questions have been posed on who have remained excluded or invisibilised from the processes of imagining and creating prospect educational pathways in the digital age (Bayne & Gallagher 2021).

Conclusions and Discussion

This section builds upon the results in connection to the contextual factors and literature review. It firstly delves into predominant delineations of digital education and its effects in social justice and democracy. Secondly, it inquires about possible factors facilitating a disconnection between academia and digital rights. Finally, it fosters unearthing and encouraging the inclusion of educational, human rights and youth-centred pathways elevating fairer digital futures.

Which factors have enabled this mismatch between digital rights and academia?

The boost observed in digital education's publications was paralleled with notable events that since 2014 have actioned debates around democracy and human dignity in the digital age. During this time, the 'digital rights' field has expanded its scope with concerns around privacy, security and other fundamental rights, which have disproportionally affected the younger generations (La Rue, 2014; Nawaila et al., 2018). Recommendations to address these have included legal frameworks, research and global multi-stakeholder governances (UN GA, 2020). Education has been extensively discussed as instrumental across actors, disciplines and generations to materialise integral actions (Frau-Meigs et al., 2017). However, the right to a quality education in the digital age has been lightly covered in the field of digital rights (RightsCon, 2023b); meanwhile, educational frameworks have scarcely touched upon the wealth of issues intersecting digital technologies and human rights (Law et al., 2018).

The articles analysed for this study mirrored patterns of digital divides signalled above. The analysis evidenced that the key motivations described society's digital change, its effects in the growth of an educational demand, and its acceleration during COVID-19. Processes of digital transformation were generally connected to labour and economic imaginaries, such as the '4th industrial revolution'. This has been based on highly valuable intangible goods, such as data, information, and new markets for a workforce necessitated of digital life-long learning. Digital education's definitions and key features concerned with hybrid learning, cost-effectiveness, innovation, creativity and engagement. These pointed at formats to articulate digital technologies, its convenience to optimise education, and novel strategies key to keep students on track. Thirdly, reflections around the its social, political and environmental implications have been selective and dedicated to ones related to unrolling the digital superhighway. Critical thinking was mainly directed to understand optimal digital education practices. References to human rights were related to digital poverty and specific groups excluded from digital access. Participation was overshadowed with views of personalised learning and schools' data management by surveillance and prediction.

What have been the implications of privileged digital education notions?

The implications of an education driven by economic interests has been problematised by foregrounding 'divisions of learning' (Zuboff, 2019). This overlooked digital divide promoted by a surveillance capitalism has concentrated unprecedented knowledge and power over behavioural control. Advances to address this phenomenon have been mainly focussed on legislation, especially affected globally by influential regions such as the EU (Goddard, 2017; Kuner, 2020). These efforts have not been sufficiently balanced with a digital education encompassing consciousness and collective solutions, hindering the possibilities for democracies, social and climate justice. In this absence, the tech sector has advanced in education to fulfil its workforce and economic needs. Edtech's billion dollar business has commercialised devices, online courses, apps and tutor services. This has rendered into curriculum, resources and didactics more attuned with big tech businesses and better-off governments (Selwyn, 2015). This issue has been problematised alongside the expansion of privatisation and marketisation of education and its implications for democracy (Ross, 2017).

The overall lack of educational policies for the social good observed in this research has been catalysed by a lack of conceptual clarity. Several articles addressed this issue and observed the interchangeable use of different terms without elaborating on its differences. Furthermore, digital education has had an uneven progress, overly dedicated to running digital technologies in higher education and the health sector. Beyond the scope of this research, similar literature reviews and conceptual analysis have been conducted through time (Ilomäki et al., 2011; Van Laar et al., 2017). For example, a 'digital citizenship' identified four different sub-themes including media and information literacy (Choi, 2016). This has been partly affected by a competitive knowledge economy, in which experts and organisations utilise concepts as brands and 'rebranding' fields. For instance, swapping 'e-safety' for 'digital citizenship' to shift from approaches centred on adults' moral-panics of children misusing and abusing tech (Magnone, 2019).

Which digital education strategies can reorient towards fairer societies?

Digital education conveys teaching *with and about* digital technologies. This study has problematised dominant definitions, its underpinning motivators and the implications of its shortcomings. This was achieved by observing references in digital education's literature on the knowledge, skills and values concerning critical thinking, human rights and participation. Most articles had somehow addressed these overarching themes, however, these had a minimal overlapping with the growing field of human rights and digital technologies. Digital rights has been recently concerned with issues such as online hate and violence, digital security for communities and tactics for activists, among other, and intersecting these with issues of gender, environment and health (RightsCon, 2023b). Among digital education's articles, there were minimal references to topics of the digital rights realm, with few of these referring to digital access, safety and privacy in educational settings. A digital education dedicated to democracy and social justice was monumentally overlooked, especially the knowledge, competencies and values to reclaim or contest a capitalist and authoritarian digital age.

A digital education leveraging a critical consciousness and collective actions have been referenced as fundamental to materialise emancipatory digital societies (Emejulu & McGregor, 2016; Facer, 2011). This educational task has been taken up by activists and civil society from around the world, picking up the pieces of myopic techno-solutionisms built upon unfulfilled promises of security and efficiency. This approach has implied a greater investment on technological fixes over other ones that could have addressed the structural social and economic conditions at the root of the problems. Furthermore, this has resulted in an expansion of surveillance capitalism reinforcing power imbalances, for instance, among high and low income groups and geographies (Zuboff, 2019). Youth, as no other generation, has been more acutely affected by an intense digitalisation of their lives, implying constraints to their privacy, security and life-long development (Barassi 2020; Hope, 2018). Thus, a CDE across generations and centred in the best interest of present and future generations.

For the last 4 years, I have been researching and advocating for CDE and youth participation through the Jaaklac initiative (n/d). This has levelled up the knowledge and participation from Latin America and the Global Majority. Efforts have contributed to international and collaborative campaigns broadening discussions to make sense of and materialise a quality education in the digital age. Results and processes with activists, educators, youth, researchers, artists and technologists have been openly shared in social media campaigns to expand the community of practice. Space and time has been given to better reflect upon CDE and its participatory methods through my PhD studies. This has been dedicated to Latin American schools' data governance and student participation in these decisions. This SLR was among the key foundations for my doctoral research and praxis with JAAKLAC.

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