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De-normalising the (omni)presence of technologies: Contributions of the sociomaterial approach to media education

Desnormalizar a (oni)presença das tecnologias: Contribuições da abordagem sociomaterial para a mídia-educação

Desnormalizar la (omni)presencia de las tecnologías: Contribuciones del enfoque sociomaterial a la educación mediática

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Abstract: Since the 1960s, media education research, practices, and policies have focused on efforts to normalise technologies. Through the lens of sociomaterial theory, this article examines two recent cases: 1) the Brazilian National Digital Education Policy (PNED), 2) the Danish regulation for the use of generative artificial intelligence in universities. A cross-case analysis shows how the normalisation of technologies contributes to avoiding any critical approach. Based on these results, the article argues for the need to implement media education policies capable of *denormalising* the educational use of technologies.

Keywords: Media Education, Denormalisation, Sociomateriality, ChatGPT, PNED.

Resumo: *Desde os anos de 1960, a pesquisa e as políticas de educação midiática têm se concentrado no esforço de normalizar as tecnologias. Fundamentado na teoria sociomaterial, o artigo examina dois casos recentes: 1) a Política Nacional de Educação Digital (PNED), 2) a regulamentação do uso da inteligência artificial nas universidades da Dinamarca. A análise mostra como a normalização das tecnologias impossibilita qualquer abordagem crítica. Com base nos resultados, defende-se a necessidade de realizar políticas de mídia-educação capazes de questionar e desnormalizar o uso educacional de tecnologias.*

Palavras-chave: *Mídia-educação, Desnormalização, Sociomaterialidade, ChatGPT, PNED.*

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Resumen: *Desde la década de 1960, las políticas de educación en medios se han centrado en los esfuerzos por normalizar las tecnologías. Con base en la teoría sociomaterial, el artículo examina dos casos recientes: 1) la Política Nacional de Educación Digital en Brasil, 2) la regulación del uso de la inteligencia artificial en las universidades danesas. El análisis muestra cómo la estandarización de las tecnologías imposibilita cualquier enfoque crítico. A partir de los resultados, se defiende la necesidad de implementar políticas capaces de desnormalizar el uso educativo de las tecnologías.*

Palabras clave: *Educación mediática, Desnormalización, Sociomaterialidad, ChatGPT, PNED.*

INTRODUCTION

Since the 1960s, a body of theoretical and methodological research dedicated to examining the role of media in education has been translated into public policies and practices aimed at integrating technologies within teaching and learning practices. The political effort to align schools with contemporary society was justified by the argument that, due to the increasing pervasiveness of technology across various domains of life, education must assume the responsibility of cultivating media competencies among children, youth, and adults (Bévort; Belloni, 2009; Eleá; Pischetola, 2015).

Considered part of citizenship education (Belloni, 2022), media education comprises pedagogical initiatives that foster both creative production and critical reflection (Rivoltella, 2005) and includes a series of strategies that aim at establishing media literacy within different educational contexts (Pischetola, 2013).

Historically, media education has developed through social movements committed to questioning the hegemony of mass media and the reproduction of social inequalities, while also advocating for resistance in contexts of military dictatorship, particularly in South America. A shared concern among these movements was the audiences' formation through critical reading and interpretation of disseminated content (Fantin, 2011). In other words, in its early stages, media education was primarily focused on the political and social dimensions of the presence of media in society.

Since the 1980s, research in the international context has increasingly presented a normative perspective on the presence of media artefacts in education, asserting that schools must adopt a new stance towards technology (Masterman, 1985), with media being regarded as essential elements for student engagement in the educational process (Jenkins, 2006). New demands have emerged concerning teacher training, not only in terms of the need to develop new skills but also to incentivise more positive attitudes towards media and technologies (Gonnet, 1997).

The Brazilian literature reflects this normative perspective, linking the primary objectives of media education to active participation (Fantin, 2007), the democratisation of social communication processes (Bévort; Belloni, 2009), and the experimentation within different languages (Girardello, 2003). At this respect, media are perceived as a "precious and inevitable key to ensuring citizenship expression and inclusion" (Eleá, 2014, p. 12), and there is little critical reflection on the need and purpose of integrating technologies into schools and education more broadly.

Nevertheless, over the past two decades, some critical voices have emerged, highlighting the need to overcome technological reductionism (Ferreira; Lemgruber, 2018) and the instrumentalist view of technology (Pischetola; Miranda, 2019). In this line of thought, analyses have been conducted on Brazilian public policies—such as the National Education Plan (PNE 2014–2024), still in practice at the time of this writing, the National Educational Technology Programme (ProInfo), the Connected Education Innovation Programme, the One Laptop per Student Project (UCA Project, initiated in 2007), and, more recently, the National Digital Education Policy (PNED). These analyses show how the idea of technology as an inevitable tool is extensively promoted in official documents (Venco; Seki, 2023; Castro *et al.*, 2020).

Other scholars have suggested that we need a critical attitude towards the role of media and technologies in education and have raised new concerns regarding public education (Ferreira, 2023; Selwyn *et al.*, 2020). Among these concerns are, for example, the commercial interests of major corporations that develop educational technologies (Williamson, 2019) and the global phenomenon of the platformisation of schools (Cone, 2023), which are embedded in broader and more complex trends such as datafication, commodification, and surveillance. These processes involve companies profiting from monitoring individuals, including minors, by commercialising their data (Rodrigues, 2020).

In addition to these concerns, scholars highlight the imposition of "computational thinking in innovative packages" on schools (Habowski *et al.*, 2019, p. 11), which disregards the multiple dimensions of the presence of technology in the classroom — such as the cognitive, environmental, technical, and creative factors. These processes contribute to the expectation of standardising human actions mediated by technology, ultimately leading to the constant unreadiness, deprofessionalization, and even dehumanisation of teachers (*ibidem*). However, such issues do not appear to challenge the normative stance of media education policies[3], which continue to advocate for the necessity of schools to 'keep pace with society'. It

3 Here, they are considered as a broad set of processes and practices related to the formulation, implementation, and evaluation of governmental and institutional policies concerning the relationship between education and technology.

is suggested that we need to create spaces for dialogue, reflection, and critical literacy while supporting pedagogical innovation (Rocha *et al.*, 2020), without questioning the material necessity of media presence in educational settings.

Grounded in sociomaterial theory, this article aims to question the notion (as well as the process) of normalisation, domestication, and naturalisation of technologies in education, offering an alternative analysis to the prevailing debates, and suggesting to critically examine the unexpected consequences of technology.

In the first section, the article briefly presents the theoretical framework of the sociomaterial approach, which understands technology as an agent, that is, as an active subject within the educational context, and enables the transcendence of the dualism between technologies and their social/educational effects. This allows for problematising the epistemic reproductions that underpin the normalisation of technologies and the normativity of media education (Pischetola *et al.*, 2021). The second section examines two recent cases of technology normalisation in education, in a Brazilian and in a Danish context, focusing on how materiality is separated from the social in this process: (1) the National Digital Education Policy (PNED), a Brazilian public policy enacted in 2023; and (2) the regulation of the use of open generative languages (such as ChatGPT) in Danish universities (2022–2024).

The selection of these two cases is based on the aim of demonstrating how the normalisation of technologies occurs at multiple policy levels, ranging from local/institutional dimensions to national frameworks. Furthermore, by focusing on two very different cases, we seek to illustrate how this process of normalisation unfolds in different countries, including the two countries where the authors of this article reside and work. Employing sociomaterial theory as an analytical framework, the study uses a cross-case analysis to reveal how the normalisation of educational processes and practices, which involves both humans and technologies, shapes our understanding of (media) education.

SOCIOMATERIALITY AND THE NORMALISATION OF TECHNOLOGIES IN EDUCATION

The sociomaterial perspective is a theoretical-methodological approach that seeks to make visible what happens to things through the observation of everyday micro-practices ‘’, and how they not only shape the relationships between human and non-human actors, but also materialise collective actions (Fenwick *et al.*, 2011). Considered a broad theoretical-conceptual umbrella emerging within the social and human sciences, sociomateriality encompasses concepts derived from Actor-Network Theory (Callon; Latour, 1981), posthumanist and material-semiotic theory (Haraway, 1991), and material feminism (Barad, 2007).

By challenging strictly humanist and representationalist perspectives in the field of education, which consider humans as the primary agents in the pedagogical process, sociomaterial approaches seek to examine micro-practices — whether social, cultural, educational — from the perspective of the relationships between all agents, human and non-human (Decuypere; Simons, 2016). This entails subverting the view that considers digital technologies as inert entities assigned instrumental and utilitarian roles which make them subordinate to human intentions. Instead, technologies are understood as performative, and their action is seen in conjunction with other objects and forces (Lenz Taguchi, 2013).

In education, the perspective of inseparability between the social and the material inspires methods for recognising and tracing different struggles, negotiations, and accommodations whose effects constitute material 'things' (Fenwick *et al.*, 2011). Moreover, such an approach can allow us to discern the specific power relations that emerge through the presence and daily use of technologies, the material results of mainstream production and consumption trends, and the unequal opportunities they generate among users. This means that a sociomaterial approach allows for questioning the technologies presumed neutrality in education (Pischetola *et al.*, 2021). Through a sociomaterial lens, Landri (2014) examines educational policy as typically conceived exclusively in terms of human agents and their knowledge, whereas the author suggests that it should instead be studied as a 'becoming' process — that is, by observing the ways in which it materialises and is enacted in practice. According to Decuypere and Simons (2016), human-technology relations are not only non-neutral but also exert performative effects on educational policies, which, in turn, generate different spatial and temporal configurations — at times fluid, at others fixed and less open to debate and contestation.

In this article, we argue that the sociomaterial theory enables us to move beyond a discourse rooted in the premise of normalisation that precludes critique (Venco; Seki, 2023) by focusing on the relationships between subjects and matter — including technologies, bodies, affects, and emotions. Rather than considering media as indispensable, domesticated, inevitable, and fundamental to education, sociomateriality poses a few difficult questions: in what ways is matter transforming the classroom in a specific place and moment through specific practices and uses? What are the short- and long-term effects of the relationship between materiality and sociality? In this way, following Miranda (2023), we understand that a focus on sociomateriality can contribute to critical approaches by serving as a 'sensitisation device' and sparkling awareness among educators, parents, institutions, and public policies about the present and future implications of the presence of technologies in classrooms.

METHODS AND MATERIALS

Our study presents two recent cases of policies concerning the use of technologies in education — one from Brazil and the other from Denmark. The decision to analyse and discuss the PNED and the regulation of ChatGPT in Danish universities is first justified by the urgency with which these policies seek to normalise the use of digital technologies in education. Furthermore, both cases have been part of direct experience of the authors, who are able to analyse how the two policies reflect in their teaching practices, allowing for an additional perspective on the educational contexts within the countries where they work. We understand that these methodological considerations align with the value given by a sociomaterial perspective to situated micro-practices, as well as to embodied and entangled data, methods, and research findings (Haraway, 1995).

In this regard, it is worth to highlight that our aim is not to conduct a comparative analysis, for two main reasons. First, we acknowledge that comparative research in education follows modern scientific canons based on binary divisions, such as global/local, convergence/divergence, and qualitative/quantitative, which compel researchers to adopt a position within these dichotomies (Silova; Rappleye, 2015). This *modus operandi* is not compatible with a sociomaterial approach, which instead focuses on the relationships between all components of a given phenomenon, in the attempt to overcome such dichotomies.

Secondly, since the 1990s, comparative research has primarily focused on measurement, promoting the circulation of a discourse that tends to impose specific solutions as 'evident' or 'natural' responses to educational issues (Nóvoa; Yariv-Mashal, 2014).

Distancing ourselves from the assumptions of the comparative approach, we adopt a methodology that has been defined as cross-case analysis (Khan; VanWynsberghe, 2008), which involves studying different cases simultaneously and using data from diverse contexts in order to explain the complexity of a (transnational) phenomenon. This method provides us **with a new way of understanding how things have emerged — that is, their process of** materialisation within specific social circumstances. Wichmand *et al.* (2023) emphasises that a cross-case analysis operates with the same principles of dialogical and relational theories, focusing on the relationship between cases rather than comparing or contrasting their outcomes. Drawing on these ideas, we consider that a cross-case method aligns with the theoretical foundations of the sociomaterial perspective, as it takes into account the different conditions that give rise to a phenomenon without attempting to reduce it to its constituent elements.

The methodology was developed in three stages. First, the two authors worked independently on the analysis of each case. Drawing on Haraway's sociomaterial perspective, emphasis was placed on the concrete, material experience of reading. In this sense, the first critical scrutiny of the data aimed not only to interpret the content in isolation but also to understand the differences that knowledge production practices create and the effects they might generate in the world. This process involved investing time in reading and re-reading the documents, with the aim to create "alternative readings and interpretations with new layers or strata of understanding" (Merten, 2021, p. 15).

In the second stage, the results were juxtaposed to reflect on common elements and the specificities of each case. The sociomaterial theory was activated at the end of this phase. This second and deeper level of analysis was guided by the following research questions:

1. What are the processes of technology normalisation that connect the cases examined?
2. To what extent are the policies overlooking the technologies' sociomaterial agency?

Finally, the authors discussed the possibilities of reversing the discourse of normalisation of technologies in education and the potential of this approach for media education. This discussion is enriched by a call for adopting a critical stance not only towards the political implications of technology in education, but also towards the limitations and concrete possibilities of media literacy.

CASE 1: PNED

In public policies related to media education, technology is commonly associated with progress, serving as an instrument of social development. In this context, the recent enactment of Law No. 14.533/23, which establishes the National Policy for Digital Education (PNED) in Brazil, is characterised by reinforcing the unquestionable nature of the relationship between education and digital technologies (Venco, Seki, 2023), particularly in its second structural axis, *Digital School Education*[4]. Proposed as a national regulatory document[5], PNED's objective

4 The PNED is structured around four pillars: (I) Digital Inclusion; (II) School-Based Digital Education; (III) Digital Training and Specialisation; and (IV) Research and Development (R&D) in Information and Communication Technologies (ICTs).

5 The PNED coordinates public actions and programmes implemented across federal entities (states, municipalities, and the Federal District).

is to establish guidelines and suggest strategies to promote digital inclusion, especially of vulnerable people, and to encourage the adoption of digital technologies in public education. Teaching and pedagogical practices are considered central elements in the pursuit and dissemination of digital competences, from primary to higher education (Brasil, 2023).

It is worth highlighting that the focus on teaching and schools is directly linked to the articulation of the PNED with Law No. 9.394/96, the National Education Guidelines and Framework Law (LDB), which regulates and organises the entire Brazilian education system. Upon its enactment, the PNED amended the LDB and incorporated into Chapter III — concerning the "Right to Education and the Duty to Educate", enumerating the State's responsibilities regarding public schooling — a new provision on digital education. Secured by law, under the PNED digital technologies became a 'right' to connectivity for all public institutions, from primary to higher education, which will ensure access to high-speed internet networks that are 'suitable for pedagogical use' (Brasil, 2023). This inclusion serves to update the LDB, and consequently Brazilian schools and education, to align with the trends of the contemporary society. By proposing the inclusion of more vulnerable groups of citizens through public education, the PNED posits itself as a tool for educational renewal, which will unfold access to digitalisation and development brought about by digital technologies.

For the analysis proposed in this text, we focus on Pillars II and III, where a common perspective of causality can be observed — one that characterises the discourse adopted by the PNED and, along with it, the governmental policies and initiatives that incorporate digital technologies in the pursuit of digital education.

CAUSALITY

The PNED is based on a characteristic of technological determinism, a perspective that assumes that the presence of technology (as a material object) in a given social environment — the school, in this case — produces a predictable and predetermined effect, namely digital inclusion.

During the legislative process of the Proposed Act No. 4.513/2020[6] in the Federal Senate, which led to the establishment of the PNED, the rapporteur of the Committee on Science and Technology (CCT) — one of the committees involved in the assessment of the Proposed Act — justified the need for public debates on the matter in the following terms:

6 Following the procedures of the Brazilian legislative process, the PNED was first introduced in the Chamber of Deputies by Federal Deputy Ângela Amin in 2020 and was finalised with the signature of President Lula da Silva on 23 January 2023, when it was officially enacted.

> It is undeniable that today all public policies must focus on digital education, teacher training, and infrastructure development [...]. The formulation and implementation of a comprehensive national digital education policy are urgent, so that Brazil can develop internally as well as integrate into the context of the Digital Society nations. (Brazil, 2022, p. 2 – translated by the authors)

By relying on the discourse of inevitability, the justification for the PNED presents digital education as a cause that will have national development as a result. To achieve this development, it will be enough for teachers to use technologies in their practices, adapting to the methods supported by media education.

> [...] a teacher does not necessarily need to be fully familiar with technologies to use them in a way that enhances the teaching and learning experience. Instead, they should be open to innovative pedagogies and understand the benefits that these technologies can bring to their work (Brazil, 2020, p. 14, translated by the authors).

It is within Axis II, School Digital Education, that the PNED guides such pedagogical practices, encompassing all teacher education programmes without distinction. Still grounded in causality, Strategy IX of this axis proposes:

> The promotion of pre-service teacher training at all levels of education with a focus on digital competencies, digital citizenship, and the ability to use technology, regardless of their field of study (Brazil, 2023, translated by the authors).

When examining the proposals outlined in Axis III, 'Digital Training and Specialisation', which focuses on the development of teachers' digital competencies, the encouragement of the creation and adoption of the 'bootcamp' model, as presented in § 2 of the aforementioned law, suggests that mere exposure to technology will suffice to develop and update pedagogical practices. The 'encouragement of the creation of bootcamps' constitutes Priority Strategy XI of Axis III, defined as:

> Short-term immersion programmes in computational techniques and languages, with a limited class size, prioritising practical learning through the experimentation and application of technological solutions. (Brazil, 2023, translated by the authors).

In the United States, where this model was originated, several analyses indicate that the aim of certifying new teachers via bootcamp – as quickly as possible and with minimal academic work – tends to significantly undermine a critical perspective, disregarding anti-racist and social justice-oriented approaches. Instead, it reduces teacher training to basic classroom management principles combined with technical content knowledge (Nygreen *et al.*, 2015; Friedrich, 2014). Nevertheless, this model aligns with the objective of Axis III, which is to 'train the Brazilian

working-age population, providing opportunities for the development of digital skills for the full integration into the labour market' (Brasil, 2023). Here causality is evident in the assumption that integration – and consequently success – in the labour market is a direct effect of the acquired digital competencies.

CASE 2: CHATGPT

In November 2022, an advanced language model called ChatGPT-3 was made available to the general public, positioning itself within the realm of what is known as generative artificial intelligence (genAI). This chatbot is capable of producing sophisticated texts that closely resemble human writing, thereby encouraging a perception of intelligence and trust in the user (Jo, 2023). It can be instructed to assume a variety of roles, such as teacher, student, or specialist, in order to give different answers and perform different tasks, including analysing, summarising, and comparing (Adeshola; Adepoju, 2023).

Based on these characteristics, it is not surprising that ChatGPT has attracted widespread academic interest, leading to a significant number of publications focusing on both its opportunities and challenges. As a result, many institutions have asserted the urgent need to review their policies and regulations regarding the use of genAI, in particular around current practices of student assessment and examinations, which need to be revised in what is viewed as a major organisational shift (Driessens; Pischetola, 2024).

For the purposes of our analysis, the case of the regulations introduced at the eight public universities in Denmark between December 2022 and June 2024 will be considered. These are: the University of Copenhagen (UCPH), Aarhus University (AU), the University of Southern Denmark (SDU), Roskilde University (RUC), Aalborg University (AAU), the Technical University of Denmark (DTU), the Copenhagen University of IT (ITU), and the Copenhagen Business School (CBS)[7]. These regulations focus almost exclusively on rethinking the academic assessment of exams, where the authenticity of the submitted text is crucial. Consequently, several

7 In contrast to secondary and vocational education, which is subject to the government's exam policy set by the Ministry of Children and Education of Denmark, danish universities are autonomous, with adherence to their own regulations being ensured. Below are the links to the regulations analysed:
https://pkunet-shared.ku.dk/newsroom/news/Pages/Three-guidelines-and-a-new-tool-for-using-AI.aspx (UCPH);
https://educate.au.dk/en/teaching-with-technology/chatbots (AU);
https://mitsdu.dk/en/mit_studie/kandidat/mellemoeststudier_kandidat/vejledning-og-support/aipaasdu (SDU);
https://ruc.dk/en/generative-ai-roskilde-university (RUC);
https://www.students.aau.dk/rules/rules-for-the-use-of-generative-ai (AAU);
https://sites.dtu.dk/teachingdtudk/guidance/ai-info (DTU);
https://itustudent.itu.dk/Study-Administration/Generative-AI (ITU);
https://libguides.cbs.dk/c.php?g=684990&p=5136839 (CBS).

universities have incorporated their original policies on genAI into exam regulations and plagiarism rules, prohibiting the use of such technologies. The excerpt below is an example that summarises the most common rules:

> To safeguard the purpose and integrity of the exam situation, which is to assess the knowledge, understanding, skills, and abilities of individual real-life students, CBS has decided to ban the use of GenAI in all exams ***other than bachelor's theses, master's theses, and final projects (HD / executive education)***, unless otherwise stated in the specific regulations for a particular exam [CBS].

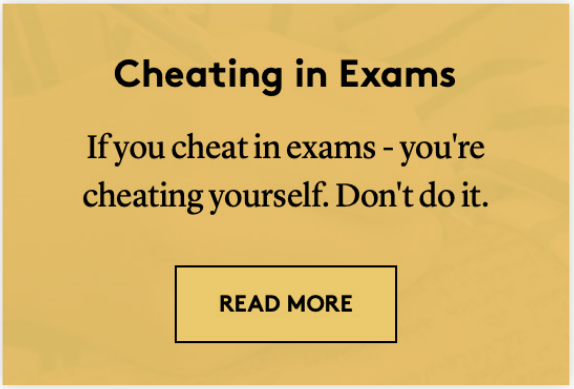
However, since the beginning of 2024, three Danish universities (UCPH, AU, and DTU) have updated their policies to expand the academic use of AI in final exams, with a dual objective: "to use natural and technical sciences for the benefit of society" and "to offer leading engineering programmes in Europe" [DTU]. The presence of genAI in higher education is here accepted to the extent that it regulates the change of established academic practices, without questioning the long-term effects these decisions will have on universities. In what appears to be a logical extension of this way of thinking, the solution adopted by the universities is to create rules for the critical, ethical, and legal accountability of the user.

ACCOUNTABILITY

The concern expressed by Danish academic institutions primarily relates to the veracity of the results that ChatGPT generates in its text outputs, as these may not be factual or accurate, they may contain errors and/or reinforce existing biases (Driessens; Pischetola, 2024). All available university policies include warnings regarding these issues. However, only one case provides an explanation as to why this occurs: at UCPH, which has a section titled "The Technology Behind ChatGPT". Despite the clear intention to raise awareness about these concerns, the limitations are not presented as a reason to discourage the use of genAI. On the contrary, it is suggested that the responsibility for an ethical and correct use of technology lies with the individual, linked to an implicit solution within the policies, namely critical literacy and source critique — both skills that should be acquired or enhanced through (future) media education courses that will be organised by the institutions.

In other institutions, ethical responsibility is explicitly emphasised with focus on the value of study and learning. In the SDU regulations, for example, a warning is directed at students, explaining that cheating in exams is a way of deceiving yourself (Figure 1). In the side text, it is also explained that "the student is you, not the chatbot".

Figure 1 - Regulation on AI by SDU



Source: available at:
https://mitsdu.dk/en/mit_studie/naturvidenskabelige_uddannelser/vejledning-og-support/aipaasdu

Other institutions emphasise ethical responsibility with respect to the good practices of the academic community:

> Good academic practice means *never* presenting the ideas or statements of others as your own. You must always refer to the ideas and statements of others with explicit and correct references. This principle applies to use of generative AI as well.
> You may well benefit from familiarizing yourself with the three fundamental principles for good academic practice: honesty, transparency and accountability as defined in the Danish Code of Conduct for Research Integrity from 2014 [AAU].
>
> You may use generative AI as an aid tool in your everyday life as a student, including for participation in classes and lectures. However, it is crucial to uphold good academic practice when using generative AI as a student in written assignments, particularly during exams, where you are responsible for both form and content [RUC].

It is worth noting that at the time of this analysis, the examined guidelines of these eight institutions did not present long-term assessments of the presence of this new technology for academic use. On the contrary, the explanations that support its use are generally taken for granted, as conforming to genAI is somehow considered as being part of the future. The excerpt below is an example of this narrative:

> ITU acknowledges that generative AI-tools will dominate workplaces of the future, so we continuously adapt to the changes and needs of society and businesses. On this page, you will find inspiration for how to use and how not to use generative AI in your studies [ITU].

In conclusion, our study on Danish university policies regarding generative AI indicates that their regulation primarily follows conventional approaches to rethink assessment and rules on fraud and plagiarism, with the aim to avoid legal issues or violations concerning privacy and copyright. Moreover, the policies alert users about concerns regarding veracity and bias, placing the responsibility for an ethical and responsible use on them. At this respect, media education emerges as the only named solution, as stated in the webpage on digital literacy courses that will be offered at the University of Copenhagen:

> From September 2024, all undergraduate programmes at UCPH will include a focus on students' digital literacy as a mandatory element in the curricula. At the same time, the widespread use of generative AI as an integrated element in many of our work tools (MS Office, search engines, etc.) has made digital literacy for students no less an important area of focus [UCPH].

RESULTS OF THE CROSS-CASE ANALYSIS THROUGH THE LENS OF THE SOCIOMATERIAL THEORY

When a new technology enters the market, the usual conclusion presented in the literature on media education is the need to develop both institutional policies and training courses to both mitigate the negative impacts of the new technology and maximise its benefits (Driessens; Pischetola, 2024). This process is also evident in the two cases considered, especially when viewed diffractively (Barad, 2007) that is, in dialogue with each other. In the case of the Brazilian National Digital Education Policy (PNED), the need for media education is presented as an obligation placed upon teachers and their need to upgrade their pedagogical practices. In this way, by including digital education in the primary education law (the LDB), the PNED advocates for the inevitability of digital technologies in teaching practices. By proposing the inclusion of "more vulnerable groups of citizens" (Brazil, 2023) through public education, the celebrated educational renewal brought about by digital technologies becomes an undeniable fact for teachers and, therefore, irrefutable, unquestionable, and unchallengeable.

Contrary to what the policies tend to assert, research in the field of technology and education shows that digital technologies neither reframe teaching practices in schools, nor encourage the adoption of truly innovative methodological approaches (Selwyn *et al.*, 2020). Based on causality, the discourse of the PNED both elevates teachers to the status of protagonists of this law – achieved by simply adopting technologies in their work– and holds them accountable for possible failures and delays.

In our analysis, we argue that the PNED tends to reinforce existing power structures by affirming, rather than questioning, traditional pedagogical approaches and their perspectives on how students learn and are assessed, as well as how teachers teach and are trained. Presented both in the policies and as manifestations of an irrefutable historical movement, as well as in media-educational approaches that consider it "necessary for different formative instances to take on the task of media education as a condition of citizenship" (Fantin; Martins, 2023, p. 44, translated by the authors), the aspects of undeniability and causality ultimately silence any social criticism regarding the presence of technologies in education — thus clearly separating the social from the material.

On the other hand, the case of the academic regulation of ChatGPT, despite its geographical and cultural distance, proves analogous to the case of the PNED. University policies are viewed here as an instrument that will enhance the positive outcomes of academic genAI, for example by generating benefits for society if supported by responsible practices towards ethics, care and human-centred AI. It is established that a user equipped with critical thinking and digital competence is not only capable of obtaining the correct information from ChatGPT but also of understanding its limitations and 'moral issues' (Adeshola; Adepoju, 2023), such as privacy, biases, illegitimate data usage, and the exacerbation of social inequalities. In this respect, we observe that the relationship between technology and social/educational change is again understood as undeniable and causal, with ChatGPT being presented in a deterministic view, as a driver of a radical shift in academic practices, study, and research, which must be urgently regulated.

Thus, the crossing of the two cases presented can reveal some common aspects of the normalisation of technologies in education that emerged from the analysis.

1. Despite the differences between the two contexts, the discourse of causality is present in both cases. Grounded on the justification of inevitability that marks any material presence of technologies in education, policymakers appear to consider the norms (and their power of action) as something pre-determined, rather than a social form still under construction, that is, a process in becoming. Sensitive to the multiplicities of agents and the emergent effects of their interactions, we argue

that this discourse constructs 'technologies' solely materially, ignoring the political forces at play and the power relations that guide the imposition of technologies in the educational landscape. Furthermore, this discourse establishes a paradox, which can also be transposed to the general approach of media education. By relying on a certainty, that is, the inevitability of digital technologies for the emancipation of education and the citizenship of individuals, this intangible certainty is precisely what hinders its outcomes.

2. In both contexts, a clear accountability of the user is present, which is associated with unconditional faith in the development of critical skills that the user may (eventually) acquire through (future) media education training initiatives. In contrast with this vague optimism, we maintain that offering meaningful digital literacy, as well as genAI and data literacy programs, is not at all a simple task. Moreover, it is often left as a burden for the teachers or imagined as part of institutional initiatives that are yet to be developed. In this respect, it is important to reassert what we stated in the introduction of this article, that the consequences of the presence and normalisation of technologies in education are highly complex global phenomena, impossible to be addressed by individuals alone, but rather requiring structured action at the institutional level.

The cross-analysis shows that the different positions expressed in the examined policies are based on common assumptions of the normalisation of technologies in education. Technology is understood as an agent that operates independently, without human interference – with undeniable, inevitable, and predictable consequences for society (the assumption of causality). Otherwise, technology is assessed as a mere tool that can be used for positive or negative purposes, whose outcomes will depend on the responsibility of the users, their critical skills and moral values (the assumption of accountability). Both assumptions guide not only policy proposals but also research and media-educational practices, which consistently emphasise the need to 'domesticate' media within social/educational processes.

In this scenario, media education once again presents itself as the fundamental solution for creating users' awareness, as something that needs to be done in the face of the unquestionable presence of technologies in education. It is understood that media education policies can support the benefits of technologies, as well as reduce or limit their negative effects (Rocha *et al.*, 2020). However, from this perspective, we see that media and technologies are conceived solely in terms of human action, from a dualistic standpoint. This approach presents two shortcomings. On the one hand, media-educational practices privilege only the human epistemological point of view, to the detriment of the multiplicity of agents and their situated actions. We argue that

avoiding this one-sided perspective would allow for challenging the assumption that digital technologies are inevitable, as more complex perspectives on the educational becoming could be taken into account.

On the other hand, subordinating technologies to human intention and design makes it possible to ignore non-human agency as something that does not participate in the performance of teaching, learning, and knowing (Pischetola *et al.*, 2021). Therefore, it also allows for ignoring non-human agency when conceiving educational policies.

Through sociomaterial lens, we understand that the combination of causality and faith in media education/literacy places too much responsibility on teachers and students, while leaving deeper issues and long-term consequences untouched, such as the reproduction of social inequalities through repeated and discriminatory biased outcomes. The unpredictable consequences of technologies are not considered at any point, as if human agency were the sole determinant of their use (Haraway, 1991; Lenz Taguchi, 2013). From a sociomaterial perspective, the inseparability of matter and discourse is also emphasised, refocusing attention on the fact that reality is co-constituted by multiple agents who are both reshaping and being reshaped by political movements and actions.

We suggest that new questions must be raised, such as: what are the consequences of the PNED for Brazilian education when, in teacher training (both pre-service and in-service), digital technologies and 'innovative pedagogies' are defined as an undeniable benefit enshrined in law? What are the long-term effects arising from the limitations of generative AI for studying, teaching, learning, and researching in universities not only in Denmark but in all countries where these technologies have entered the academy? At the same time, what are the consequences of global exclusion for the others? And further: what are the dangers of a singular, dualistic narrative concerning technologies and their benefits for education?

From a sociomaterial perspective, it is understood that the inextricable relationship between the human subject and technology does not allow for a clear distinction between what is 'good' and what is 'bad' in technologies but rather suggests that they have unpredictable political consequences for society (Driessens; Pischetola, 2024; Ferreira, 2023), due to their agentic power (Fenwick *et al.*, 2011). Once we recognise that technology creates meanings and values that raise political and ethical questions, we can proceed with the development of policies that respond to a critical analysis of digital education and AI, supporting different forms of regulation and guidance for educational systems, without, however, relying on an inevitable normalisation of technologies in education.

CONCLUSION

Based on the analyses and reflections presented, this article argues for the need for a media education that would not only promote adaptation to technological innovations (perceived as inevitable) but could also encourage affective interventions to question and therefore potentially denormalise the social/educational use of digital technologies.

In this line, Selwyn (2022) proposes the concept of "digital degrowth", according to which educational technology needs to be rethought, not only to avoid harmful impacts on the environment and the planet's ecosystems but towards more human and sustainable forms of use, ones that are generative and empowering for all. The author suggests questioning the lasting effects of technologies in education, beyond the dualism between benefits and limitations that dominates research in this area. In this line of thought, educational technology requires a radical rethinking.

In a complementary perspective, Pischetola and Dirckinck-Holmfeld (2024) offer several research questions to rethink higher education spaces and denormalise the technological future of the university. The authors present various examples of the silencing of differences, the increase in inequalities, oppression, injustice, and social exclusion, all driven by technologies in the realm of education. In other words, they propose looking at the political effects of technology within academic spaces.

In this scenario, we highlight that the actions of teachers, students, and researchers are not only central resources for participation in a pedagogical structure, but also co-constitutive agencies of policies and regulations regarding technologies in education. Thus, technologies are established as inevitable normalisation acts in a restrictive way towards the complexity of relationships that exist in a pedagogical space. This complexity is ignored in favour of the omnipresence of technologies, while its consequences are predicted, anticipated, and made visible in official documents, becoming the foundation of media-educational practices.

The research presented here offers a contribution in a critical direction, specifically by placing media education in a debate that is both emerging and necessary. From a sociomaterial perspective, seeking and advocating for the denormalisation of technologies means rethinking their role in education, questioning their invisible agencies and asking what the possible long-lasting effects of their presence in educational institutions might be, as well as what the truly achievable possibilities for media-educational work are.

REFERENCES

ADESHOLA, Ibrahim; ADEPOJU, Adeola Praise. The opportunities and challenges of ChatGPT in education. **Interactive Learning Environments**, p. 1-14, 2023. Disponível em: https://www.tandfonline.com/doi/full/10.1080/10494820.2023.2253858. Acesso em: 20 maio 2024.

BARAD, Karen. **Meeting the universe halfway: Quantum physics and the entanglement of matter and meaning.** Duke University Press, 2007.

BELLONI, Maria Luiza. **O que é mídia-educação.** Campinas, SP: Autores Associados, 2022.

BÉVORT, Evelyne; BELLONI, Maria Luiza. Mídia-Educação: conceitos, história e perspectivas. E**duc. Soc.**, Campinas, v. 30, n. 109, p. 1081-1102, set./dez. 2009. Disponível em: https://doi.org/10.1590/S0101-73302009000400008 . Acesso em: 19 maio 2024.

BRASIL. **Lei nº 14.533, de 11 de janeiro de 2023**. Institui a Política Nacional de Educação Digital e altera as Leis nºs 9.394, de 20 de dezembro de 1996 (Lei de Diretrizes e Bases da Educação Nacional), 9.448, de 14 de março de 1997, 10.260, de 12 de julho de 2001, e 10.753, de 30 de outubro de 2003. Disponível em: https://www.planalto.gov.br/ccivil_03/_ato2023-2026/2023/lei/l14533.htm . Acesso em: 10 out. 2024.

CALLON, Michel; LATOUR, Bruno. Unscrewing the big Leviathan: how actors macro-structure reality and how sociologists help them to do so. **Advances in social theory and methodology: Toward an integration of micro-and macro-sociologies**, v. 1, p. 277-303, 1981. Disponível em: http://www.bruno-latour.fr/node/388. Acesso em: 20 maio 2024.

CASTRO, José Aires de; RAABE, André Luís Alice; HEINSFELD, Bruna Damiani. Políticas Públicas para as Tecnologias na Educação e a Educação em Computação. **Revista Tecnologias na Educação**, v. 12, n. 33, p. 1-25, 2020. Disponível em: https://tecedu.pro.br/ano12-numero-vol33-edicao-tematica-xiv/. Acesso em: 19 maio 2024.

CONE, Lucas. The platform classroom: Troubling student configurations in a Danish primary school. **Learning, Media and Technology**, v. 48, n. 1, p. 52-64, 2023. Disponível em: https://www.tandfonline.com/doi/full/10.1080/17439884.2021.2010093. Acesso em: 22 maio 2024.

DECUYPERE, Mathias; SIMONS, Maarten. Relational thinking in education: topology, sociomaterial studies and figures. **Pedagogy, Culture & Society**, v. 24, n. 3 , p. 371-386, 2016. Disponível em: https://eric.ed.gov/?id=EJ1110059. Acesso em: 20 maio 2024.

DRIESSENS, Olivier; PISCHETOLA, Magda. Danish university policies on generative AI: Problems, assumptions and sustainability blind spots. **MedieKultur: Journal of media and communication research**, v. 40, n. 76, 2024. Disponível em: https://tidsskrift.dk/mediekultur/article/view/143595. Acesso em: 10 maio 2024.

ELEÁ, Ilana Sampaio (Ed.). **Agentes e vozes:** um panorama da mídia-educação no Brasil, Portugal e Espanha. Suécia: Nordicom, University of Gothenburg, 2014. 292 p.

ELEÁ, Ilana Sampaio; PISCHETOLA, Magda. Metodologias participativas: contribuições da The International Clearinghouse on Children, Youth and Media. In: BRITES, Maria José; JORGE, Ana; CORREIA, Sílvio (Ed.). **Metodologias participativas:** os media e a educação. Covilhã: LabCom, 1, 251-269, 2015.

FANTIN, Monica. Mídia-educação: aspectos históricos e teórico-metodológicos. **Olhar de Professor**, Ponta Grossa, v. 14, n. 1, 2011. Disponível em: https://revistas.uepg.br/index.php/olhardeprofessor/article/view/3483/2501. Acesso em: 19 maio 2024.

FANTIN, Monica. Mídia-Educação e cinema na escola. **Teias**, a. 8, n. 15-16, jan./dez. 2007. Disponível em: https://www.e-publicacoes.uerj.br/revistateias/article/view/24008. Acesso em: 19 maio 2024.

FANTIN, Monica; MARTINS, Karine Joulie. Entrelaçamentos entre cultura visual, cinema e mídia-educação: ensaiando diálogos com a Lei 14.533/23. In: FRESQUET, Adriana; ALVARENGA, Clarisse. **Cinema e educação digital:** a Lei 14.533. Reflexões, perspectivas e propostas. Rio de Janeiro: Universo Produção, 2023, p. 40-53.

FENWICK, Tara; EDWARDS, Richard; SAWCHUK, Peter. **Emerging Approaches to Educational Research.** London and New York: Routledge, 2011.

FERREIRA, Giselle Martins dos Santos; LEMGRUBER, Márcio Silveira. Educational technologies as tools: Critical considerations on a fundamental metaphor. **Education Policy Analysis Archives**, v. 26, n. 112. Disponível em: https://epaa.asu.edu/index.php/epaa/article/view/3864 . Acesso em: 30 jun. 2024.

FERREIRA, Giselle Martins dos Santos. Metáforas para pensar criticamente a tecnologia educacional. **Revista Educação e Cultura Contemporânea**, v. 20, p. 10919-10919, 2023. Disponível em: https://mestradoedoutoradoestacio.periodicoscientificos.com.br/index.php/reeduc/article/view/10919. Acesso em: 19 maio 2024.

GIRARDELLO, Gilka. A imaginação no contexto da recepção. **Animus Revista Interamericana de Comunicação Midiática**, V. II, n.1, Santa Maria, EDUFSM, 2003. Disponível em: https://periodicos.ufsm.br/animus/article/view/90297. Acesso em: 20 maio 2024.

GONNET, Jacques. **Éducation et Médias**. Paris: Presses Universitaires de France, 1997.

HARAWAY, Donna. Saberes localizados: a questão da ciência para o feminismo e o privilégio da perspectiva parcial. **Cadernos Pagu**, Campinas, n. 5, p. 7-41, 1995. Disponível em: https://periodicos.sbu.unicamp.br/ojs/index.php/cadpagu/article/view/1773 Acesso em: 8 maio 2024

HARAWAY, Donna. A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century. *In*: **Simians, Cyborgs, and Women:** The Reinvention of Nature. Routledge, 1991.

JENKINS, Henry. **Fans, bloggers, and gamers:** Exploring participatory culture. NYU Press, 2006.

JO, Hyeon. Decoding the ChatGPT mystery: A comprehensive exploration of factors driving AI language model adoption. **Information Development**, 2023. Disponível em: https://journals.sagepub.com/doi/abs/10.1177/02666669231202764. Acesso em: 10 ago. 2024.

KHAN, Samia; VANWYNSBERGHE, Robert. Cultivating the under-mined: Cross-case analysis as knowledge mobilization. **Forum:** qualitative social research, v. 9, n. 1, p. 34-45, 2008. Disponível em: https://www.qualitative-research.net/index.php/fqs/article/view/334/730. Acesso em: 10 ago. 2024.

LANDRI, Paolo. The sociomateriality of education policy. **Discourse:** Studies in the Cultural Politics of Education, v. 36, n. 4, p. 596–609, 2014. Disponível em:https://doi.org/10.1080/01596306.2014.977019 Acesso em: 10 ago. 2024.

LENZ TAGUCHI, Hillevi. Images of thinking in feminist materialisms: ontological divergences and the production of researcher subjectivities. **International Journal of Qualitative Studies in Education**, v. 26, n. 6, p. 706–716, 2013. Disponível em: https://doi.org/10.1080/09518398.2013.788759. Acesso em: 8 ago. 2024.

MASTERMAN, Len. **Future Developments in TV & Media Studies:** An Ecological Approach to Media Education', pp. 87-92. London: British Film Institute, 1985.

MERTEN, Kai. **Diffractive Reading.** New Materialism, Theory, Critique. Lanham: Rowman & Littlefield Publishers, 2021.

MIRANDA, Lyana Virgínia Thédiga de. Mídias, tecnologias e Educação Física: inspirações do Novo Materialismo (Feminista). **Cadernos do Aplicaçã**o, v. 36, p. 1–20, 2023. Disponível em: :https://doi.org/10.22456/2595-4377.134125. Acesso em: 8 ago. 2024.

NOVOA, António; YARIV-MASHAL, Tali. Comparative research in education: A mode of governance or a historical journey? In: **World Yearbook of Education 2014**, pp. 13-30. London: Routledge, 2014.

PISCHETOLA, Magda; MIRANDA, Lyana Virgínia Thédiga de; ALBUQUERQUE, Paula. The invisible made visible through technologies' agency: a sociomaterial inquiry on emergency remote teaching in higher education, **Learning, Media and Technology**, v. 46, n. 4, p. 390–403, 2021. Disponível em: https://doi.org/10.1080/17439884.2021.1936547. Acesso em: 8 maio 2024.

PISCHETOLA, Magda. Da crítica à criatividade: olhares sobre os projetos de mídia educação no Brasil. **Atos de pesquisa em Educação**, v. 8, n. 1, p. 386-401, 2013. Disponível em: https://ojsrevista.furb.br/ojs/index.php/atosdepesquisa/article/view/3681. Acesso em: 8 maio 2024.

PISCHETOLA, Magda, DIRCKINCK-HOLMFELD, Lone. Denormalising the Future Digital University: A feminist and Decolonial Perspective. **Networked Learning Conference**, v. 14, n. 1, 2024. Disponível em: https://journals.aau.dk/index.php/nlc/article/view/8068. Acesso em: 8 maio 2024.

ROCHA, Rosineide; FISCARELLI, Silvio Henrique; RODRIGUES, Rodolfo Augusto. Caminhos para a inovação no contexto educativo e escolar: o papel da mídia-educação, **Revista on-line de Política e Gestão Educacional**, v. 24, n. 1, p. 270–284, 2020. Disponível em: https://periodicos.fclar.unesp.br/rpge/article/view/13422. Acesso em: 10 maio 2024.

RODRIGUES, Eduardo Santos Junqueira. Estudos de plataforma: dimensões e problemas do fenômeno no campo da educação. **Linhas Críticas**, v. 26, n. 1, p. 1-12, 2020. Disponível em: https://periodicos.unb.br/index.php/linhascriticas/article/view/28150. Acesso em: 10 ago. 2024.

SELWYN, Neil. Digital degrowth: Toward radically sustainable education technology. **Learning, Media and Technology**, p. 1-14, 2022. Disponível em: https://doi.org/10.1080/17439884.2022.2159978. Acesso em: 22 ago. 2024.

SELWYN, Neil; HILLMAN, Thomas; EYNON, Rebecca; FERREIRA, Giselle; KNOX, Jeremy; MACGILCHRIST, Felicitas; SANCHO-GIL, Juana Maria. What's next for Ed-Tech? Critical hopes and concerns for the 2020s. **Learning, Media and Technology**, v. 45, n. 1, p. 1-6, 2022. Disponível em: https://doi.org/10.1080/17439884.2020.1694945. Acesso em: 22 ago. 2024.

SILOVA, Iveta; RAPPLEYE, Jeremy. Beyond the world culture debate in comparative education: critiques, alternatives and a noisy conversation. **Globalisation, Societies and Education**, v. 13, n. 1, p. 1-7, 2015. Disponível em: https://doi.org/10.1080/14767724.2014.967482. Acesso em: 22 ago. 2024.

VENCO, Selma Borghi; SEKI, Allan Kenji. Política Nacional de Educação Digital: uma análise de seus rebatimentos na educação pública brasileira. **Germinal:** marxismo e educação em debate, [S. l.], v. 15, n. 2, p. 448–471, 2023. Disponível em: https://periodicos.ufba.br/index.php/revistagerminal/article/view/54144. Acesso em: 22 ago. 2024.

WICHMAND, Mette; PISCHETOLA, Magda; DIRCKINCK-HOLMFELD, Lone. How to Design for the Materialisation of Networked Learning Spaces: A Cross-Case Analysis. In: **Sustainable Networked Learning:** Individual, Sociological and Design Perspectives (pp. 145-165). Cham: Springer Nature Switzerland, 2023.

WILLIAMSON, Ben. New power networks in educational technology. **Learning, Media and Technology**, v. 44, n. 4, p. 395-398, 2019. Disponível em: https://doi.org/10.1080/17439884.2019.1672724. Acesso em: 10 maio 2024.

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