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A PRINCIPLED PLEA FOR ANALOGUE STUDY PRACTICES IN THE DIGITAL UNIVERSITY

Zasadna prośba o analogowe metody nauki na cyfrowym uniwersytecie

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Abstract

European universities are fostering active learning and transferable skills. While these innovations enhance accessibility and collaboration, they often overshadow the intellectual rigor important to university education. This essay argues for a renewed emphasis on practices such as deep reading, attentive listening, and reflective writing as core practices of university education. Drawing on empirical research and philosophical insights, this essay questions the uncritical adoption of digital tools in university education and explores the metaphor of guerrilla tactics as a framework for reclaiming pedagogical autonomy. It advocates for analogue practices to preserve the intellectual and democratic functions of universities. Ultimately, preserving the rich potential of university education requires safeguarding intellectual depth, reaffirming the value of analogue practices, and sustaining the university as a space for thoughtful inquiry and pedagogical autonomy.

Keywords: university education, analogue study practices, digital technologies, intellectual rigor.

Streszczenie

Europejskie uniwersytety promują aktywne uczenie się i umiejętności transferowalne. Podczas gdy te innowacje zwiększają dostępność i współpracę, często przyćmiewają intelektualny rygor niezbędny do edukacji uniwersyteckiej. W tym eseju argumentuje się za odnowionym naciskiem na praktyki takie jak głębokie czytanie, uważne słuchanie i refleksyjne pisanie w celu kultywowania krytycznego myślenia, refleksji etycznej i autonomii intelektualnej. Opierając się na badaniach empirycznych i spostrzeżeniach filozoficznych, ten esej kwestionuje bezkrytyczne przyjmowanie narzędzi cyfrowych w edukacji uniwersyteckiej i bada metaforę taktyk partyzanckich jako ramę odzyskiwania autonomii pedagogicznej. Opowiada się za praktykami analogowymi w celu zachowania intelektualnych i demokratycznych funkcji uniwersytetów. Esej kończy się podkreśleniem znaczenia praktyk analogowych w promowaniu znaczącej nauki i krytycznego dociekania, podkreślając ich trwałe znaczenie we współczesnej edukacji uniwersyteckiej

Słowa kluczowe: edukacja uniwersytecka, analogowe praktyki naukowe, technologie cyfrowe, rygor intelektualny

Introduction

This essay provides a theoretical framework for understanding and resisting the challenges of lecturing in the digitalized university context today. It serves as a methodological justification for my lecturing work, closely tied to my fifteen years of experience as a scholar in philosophy of education within teacher education programs. Why is this justification methodological? From the outset, I oppose essentialist methodological approaches in education at all levels, including university education. Just as in research, where I believe the nature of the question being addressed determines the suitability of methodological approaches, I argue that in lecturing, the nature of the content covered should dictate the most appropriate procedures and resources. While preparing this essay[1] university professors across Spain received an invitation from the Ministry of Universities to participate in *Teaching Innovation Workshops* (June 2023).[2] These workshops, regardless of field or discipline, centred on a "neo-trinity" of didactics: the "learning assessment axis," "active learning axis," and "service-learning axis." This *monochronism* (favouring digital tools as the privileged mode of interaction) compels me to critique the imposition of standardized methods in university education. In what follows, I will discuss the methodological pillars of the pedagogical framework, the strategies, and the protocols I have been putting in place these past years as attempted compelling arguments for the continuing struggle of preserving analogue study practices[3] in the University digital age.

This article is presented in the form of a reflective essay, informed by both empirical research and my pedagogical experience. It does not aim to produce generalizable findings, but rather to provoke discussion and offer a principled stance rooted in the philosophy of education. This essay begins by analysing what is at stake in the uncritical adoption of digital pedagogies, before offering a response grounded in analogue study practices and what I describe as "guerrilla tactics."

[1] A first version of this essay was presented at the symposium *Education and the Digital Forms of Life: Questions of Risks, Necessities, and Potentialities*, held in Gdynia from September 14 to 16, 2023. I sincerely extend my gratitude to the organizers for their generosity, the collegial spirit in which the symposium was conducted, and the opportunity to share a more refined version of that presentation here at *Colloquium*.

[2] See, https://www.universidades.gob.es/jornadas-de-innovacion-docente/

[3] It is impossible, due to space constraints, to do full justice to the very relevant line of discussion on "study practices" that has engaged many distinguished scholars in the field of Philosophy of Education (e.g. Masschelein, 2024; Bayne et al., 2020; Blumsztajn et al., 2022; Marin, 2022; Vansieleghem et al., 2019). However, I would like to make clear that their work has significantly influenced how I think about and design my lecturing practices with university students. In many ways, this work serves as a testimony to their enduring impact.

The Intellectual Mission of the University: Why Content and Rigor Still Matter

Amid ongoing discussions about the role and nature of university education (Barrio, 2022; Esteban, 2022; Fulford, 2022; Garrocho, 2022), a fundamental question emerges: What should lecture at a physical university, as opposed to an online one, consist of in a world where educational institutions face numerous challenges? To remain relevant and impactful, education in physical universities should consider focus on offering what other social institutions cannot. When lecturers (Friesen, 2011) engage in meaningful and compelling topics, students will naturally listen, learn, ask questions, and strive to know more. Richard Rorty's (2005) well-known assertion *Take care of freedom, and truth will take care of itself*, serves as an apt metaphor for this approach which could be reframed as: "Let's take care of the content, and professional competencies will take care of themselves." A university's ultimate contribution lies in fostering deep intellectual engagement[4] through its content, trusting that the necessary skills and competencies will emerge organically as students encounter and respond to the specific demands of their professional lives. Historical examples abound of individuals who, educated through rigorous engagement with substantive content, have become accomplished professionals in various fields.

The unique value of the university lies in its ability to cultivate intellectual rigor (Masschelein & Simons, 2019), a quality that cannot be adequately replicated by professional environments. By prioritizing content, universities provide an irreplaceable space for critical engagement. This involves challenging students with complex readings, fostering thoughtful discussions, encouraging attentive listening, and engaging in intentional dialogue. Such an approach is particularly crucial in teacher education, where the goal is to intellectually equip future educators responsible for shaping the minds of coming generations.

Despite the enduring importance of a content-focused university education, a troubling trend has emerged in contemporary university rooms: the rapid decline in students' attention spans. This phenomenon is vividly illustrated by comparing students from just a decade ago to those of today. Each semester, the challenge of maintaining students' intellectual engagement grows, as the capacity for sustained attention diminishes. This decline not only threatens the quality of university education but also undermines the essence of what it means to study at a university. Resisting this trend requires a delicate balance. On the one hand, as university lecturers we should acknowledge the reality of diminished attention spans; on the other, we might uphold the ambition that university

[4] Throughout my argument, I will be referring to "deep learning," "meaningful learning," "critical reading," by which I mean to learning that transforms the students' understanding of the world. "Deep learning" involves critical engagement and conceptual understanding, contrasted with surface learning focused on procedures and blind memorization."

education should not merely replicate the average but aspire to something greater. As Socrates taught, beauty, truth, and justice are not always found among the majority. A university's mission can still therefore aim for intellectual excellence, even in the face of societal and cultural pressures toward mediocrity (Ash, 2006).

In my own lecturing experience (introducing philosophy of education into teacher education programs) I have been making a particularly compelling case for prioritizing content. Engaging with philosophical texts and ideas fosters rigorous intellectual development and prepares students for the ethical and conceptual complexities of their professional roles. Practices such as reading challenging texts, presenting and discussing intricate arguments, and participating in meaningful dialogues define what it means to study at a university level. This approach also aligns with Rorty's principle: focusing on the content of education enables other relevant competencies to emerge naturally. When university students are exposed to rich, thought-provoking material, they develop the intellectual and professional tools needed to navigate the complexities of whatever future roles they may play. In doing so, universities distinguish themselves from other institutions, which may excel at imparting practical skills, but often lack the depth required for a deeper intellectual preparation. The decline in intellectual rigor poses a profound challenge to the present and the future of university education. The temptation to mimic professional environments (through group work, applied tasks, and a utilitarian focus on skills) risks eroding the distinctiveness of university education. Instead, universities might recentre their efforts on content, fostering environments where students grapple with ideas that demand sustained effort and deep reflection. While much of this argument draws on my personal experience as a university lecturer, it is also grounded in a broader conviction: that intellectual rigor and philosophical inquiry are not in tension with employability but are in fact deeply complementary. The commonly drawn dichotomy between self-formation and professional readiness is, in my view, a false one. A university education that fosters deep thinking, ethical reflection, and autonomy equips students not only for personal growth but also for meaningful engagement in professional fields. Indeed, it is precisely through self-formation, understood as the cultivation of intellectual capacities and character, that students become capable of responding to complex, uncertain, and evolving work contexts. Rather than treating these goals as mutually exclusive, we should recognize that the latter depends on the former.

Ultimately, the true value of university education lies in its ability to stretch students' intellectual capacities. By resisting the pull toward practicality and mediocrity, universities can offer a counter-narrative to the prevailing cultural trends. This involves not only addressing students' current limitations but also inspiring them to reach beyond those limitations toward greater intellectual and moral aspirations. As educators, we might consider take on this responsibility with conviction, ensuring that university education remains a space for the pursuit of excellence and the cultivation of thoughtful, engaged individuals.

The Bologna Process and the Intellectual Development of Our Students

Since the Bologna Process in the early 2000s, European universities have undergone significant transformations, particularly in learning and teaching. Numerous initiatives aimed at increasing university students' participation and fostering transferable skills through community engagement have reshaped educational landscapes (Sursock, 2015). These changes reflect a concerted institutional effort to develop active learning environments, introduce innovative methodologies, and engage students more broadly. Many universities have enthusiastically embraced these practices, transitioning from traditional individual student work to teamwork, from professor-led lectures to student presentations, and from exams to applied tasks. The shift from a teacher/lecturer as a "sage on the stage" to a "guide on the side" (Biesta, 2022) embodies the larger shift towards active, student-centred learning.

While these shifts may have enriched students' academic experiences (promoting cooperation, oral communication, and engagement with real-world issues through applied research and teaching practice) they also come with significant risks. An overemphasis on technical and social skills may sideline intellectual development, an important component of university education. Intellectual growth fosters the ability to critically judge and act, competencies that cannot be reduced to skill sets but require reflective, rigorous engagement with ideas and values.

This tension compels us to reconsider the intellectual dimensions of university education within the Bologna framework (particularly in BA or MA programs more clearly oriented to the practice of a certain of type of professions such a teacher education programs, nursing, architecture, medicine, and so on). In the rush to modernize, universities risk neglecting the importance of practices like reading, writing, and reflective thinking, which are foundational to intellectual development. These activities may seem "old-fashioned" in an era of dynamic group projects and digital methodologies, but they remain vital to cultivating students' ability for addressing the moral depth and social responsibility inherent in their foreseeable professions.

I would like to make the case for what I call an "progressive yet pedagogically conservative" university study experience. It is progressive because it challenges dominant trends in university education that prioritize utility and immediate applicability over depth and critical inquiry. It is pedagogically conservative because it reintroduces and emphasizes classical practices of thinking, reading, and writing as central to the intellectual growth of future educators. This approach reflects a performative argument: that reading, thinking, and studying are fundamental to university education. Far from diminishing the relevance of evidence, methodologies, and strategies, this framework seeks to ground them in a robust intellectual foundation. By engaging students in rigorous study, we prepare them not only for the technical demands of their future professions but also for the ethical and intellectual future and unknown challenges ahead.

Key aspects of how I make use of this methodological approach include carefully curated reading assignments, seminars, and case studies. These elements aim to broaden students' moral imagination, refine their logical judgment, and provide a framework for their intellectual and professional growth. My classes are designed to help students discover the utility of philosophical ideas in educational practice, offering guidance and inspiration for navigating complex educational realities. A central tenet of my teaching philosophy is that intellectual development should remain a cornerstone of university education. This requires resisting the dominance of applied methodologies that, while useful, risk reducing education to a series of techniques. To address this imbalance, I incorporate practices that foster intellectual virtues important for teaching, such as critical thinking, reflective judgment, and ethical reasoning. This emphasis on the studious condition of university education aligns with several principles: (i) Improvement of self and practice: Drawing on Ordine (2013), anything that improves us and our practice is inherently valuable. Intellectual engagement contributes not only to individual growth but also to the broader educational community. (ii) Defining university life: Study practices like reading, writing, and reflection define the essence of university education for both students and teachers (Biesta, 2022; Ingold, 2017). These practices create spaces for intellectual exploration and dialogue, enriching the educational experience. (iii) Moral and social responsibility: University education provides the time and space to develop virtues necessary for addressing the moral and social dimensions of any profession.

Introducing these intellectually rigorous practices often encounters resistance from students. This moment of student resistance can be understood in Hegelian terms, as a form of negativity that unsettles prior assumptions, enabling intellectual formation through the disappointment of initial expectations. Many approach their university education with expectations shaped by the dominant methodological trends (prioritizing efficiency, performance, and applied techniques). For these students, the idea of engaging deeply with challenging texts, reflecting on foundational concepts, or exploring the moral dimensions of education may initially seem irrelevant, or even counterproductive. This reflects a broader societal perception of university education as a practical, skills-based preparation rather than a rigorous intellectual instruction. Despite this resistance, my experience reveals that students often experience moments of intellectual discovery when exposed to these practices. As they grapple with complex ideas, they begin to see their relevance and utility for understanding education's moral and practical dimensions. These moments of insight help students build the conceptual scaffolding needed to make sense of their educational experiences and practices, fostering a deeper commitment to their professional roles.

The Bologna Process's emphasis on active learning and transferable skills need not conflict with intellectual rigor. Rather than rejecting these developments outright, we should strive for a balance that integrates the best aspects of both approaches. Active

methodologies can enhance engagement and collaboration, while intellectual practices provide the depth and critical perspective necessary for meaningful educational experiences. For example, group projects and applied tasks can be enriched by incorporating reflective components that encourage students to critically evaluate their experiences and decisions. Similarly, digital tools can complement rather than replace analogue practices, supporting activities like reading and writing rather than diminishing their role (Marin et al., 2021).

By bridging these approaches, we can create a more rigorous educational framework that prepares university students not only for the technical demands but also for intellectual and ethical challenges. This requires rethinking the relationship between innovation and tradition, recognizing that pedagogical practices rooted in intellectual rigor remain as relevant and necessary as ever. To fully realize the potential of our students' education within the Bologna framework, we might consider prioritize intellectual development alongside skills acquisition. This involves not only reintroducing practices like reading, writing, and reflection but also framing them as important components of a modern, progressive education. By doing so, we can resist the reduction of university education to mere utility and reaffirm its role as an intellectually enriching and challenging experience.

Pedagogical Resistance: Analogue Study Practices as Guerrilla Tactic

The processes of thinking, reading, and writing are deeply intertwined with the technological tools we use. Academic practices in universities have always been influenced by technology (García del Dujo et al., 2021; Pattier and Reyero, 2022). However, there is growing concern about the dominant role of certain technologies in reshaping academic practices to such an extent that they risk undermining the fundamental nature of university education. At what point does technology's transformative impact go too far, distorting rather than enhancing educational practices?

Universities hold a profound responsibility to preserve cultural heritage, not just as artifacts for public display but as living resources for intellectual engagement. Increasingly, however, universities neglect this responsibility, failing to fulfil their public and democratic functions. To uphold their democratic principles, universities could adopt a conservationist approach toward the core elements of their curriculum, including the seemingly mundane but vital rituals of reading and studying. Through my lecturing, I emphasize the importance of preserving these analogue rituals as a means of sustaining the democratic promises of university education.

Long before the pandemic made us all (for some time) pivot to digital teaching, I had already embarked on a mission to defend analogue practices in my own lecturing activities. This effort was spurred by a chance conversation with Professor Tyson Lewis during a conference dinner. Although brief, this exchange inspired me to reflect on the

value of analogue practices and to incorporate them more deliberately into my pedagogical approach. When the academic year began that September, I implemented a classroom policy titled "EDUCATE YOUR ATTENTION." This policy explicitly prohibits the use of electronic devices during class, instead encouraging students to cultivate attention, note-taking skills, and intellectual engagement. Reading materials are distributed in hard copy rather than posted or uploaded online, underscoring the importance of tangible interaction with texts.

Predictably, this policy often elicits resistance from students, some of whom react with outright anger. To address this pushback, I rely on evidence-based arguments to demonstrate the benefits of analogue practices, arguments that I have refined and expanded over the years. While I agree with Gert Biesta's critique of over-reliance on evidence-based research (Thoilliez, 2017), I also recognize the necessity of providing a variety of compelling reasons to justify these practices. In advocating for the preservation of analogue practices, I have drawn on empirical research in education and learning to build a robust defence. Empirical research substantiates this position. For example, studies have demonstrated that handwritten notes promote deeper cognitive engagement compared to typing, which tends to encourage verbatim transcription rather than meaningful synthesis (Mueller and Oppenheimer, 2014). Similarly, research has shown that reading printed texts enhances comprehension and retention more effectively than reading on screens, which can fragment attention and reduce focus (Delgado et al., 2018; Clinton, 2019).

Beyond individual benefits, long-hand notetaking and paper-based reading embed students in shared, temporal rhythms of study that define academic life. To preserve analogue practices in an era dominated by digital tools, I would like to invite other faculty members in my position to draw on the metaphor of guerrilla tactics. By "guerrilla tactics", I refer to pedagogical strategies that are flexible, context-sensitive, and deliberately resistant to dominant institutional trends, particularly those that uncritically promote standardization and digitalization. Like guerrilla fighters, who operate with mobility and responsiveness within constraining environments, lecturers can devise localized approaches that defend intellectual autonomy and preserve analogue practices. These tactics are not about disengagement or defiance for its own sake, but rather about reclaiming space for attentiveness, dialogue, and depth within an increasingly efficiency-driven educational system. In my own lecturing activity, guerrilla tactics manifest in several ways. Prohibiting electronic devices in the classroom is one such strategy, aimed at fostering a focused and distraction-free learning environment. Another tactic involves embedding analogue practices within curricular requirements, framing them as innovative enhancements rather than regressions. For instance, requiring students to engage with printed texts and to take handwritten notes is positioned not as a rejection of digital progress but as a deliberate pedagogical choice designed to deepen their intellec-

tual engagement. These localized strategies are key for reclaiming pedagogical autonomy in the face of institutional pressures that often prioritize efficiency and scalability over depth and quality. By emphasizing intellectual rigor and critical thinking, guerrilla tactics help educators resist the homogenizing effects of digital standardization.

There are three key principled arguments that I present to my students in support of analogue study practices in university education: treasure your attention, faster is rarely better, and digital does not equal more sustainable.

Although the philosophical framework underpinning these principles foregrounds university education as a social, ethical, and intellectual practice, I also draw on empirical studies from psychology, particularly when articulating the principles at the core of my proposed stance of resistance. This choice is primarily strategic: students tend to be more receptive to arguments grounded in empirical research, especially when such evidence speaks directly to their own learning experiences. Psychological studies on attention, note-taking, and reading comprehension thus serve as accessible and persuasive entry points. They help illustrate the tangible effects of digital distraction or the benefits of handwriting, reinforcing the value of analogue practices in ways that resonate with students' expectations of what constitutes credible knowledge.

1st Principle: Treasure your Attention

Preserving attention spans is a foundational step in fostering meaningful academic engagement. To this end, I enforce a strict policy prohibiting the use of electronic devices during class. This rule is not arbitrary but is grounded in extensive research demonstrating the negative impact of digital distractions on cognitive focus and learning outcomes. The argument I present to students is simple yet profound: being free from digital technologies during lectures and seminars enhances their ability to maintain focus, engage with material, and retain information over the long term.

To illustrate this point, I often cite the 2019 study by Arnold Glass and Mengxue Kang titled *Dividing Attention in the Classroom Reduces Exam Performance* published in the journal *Educational Psychology.* This pivotal research sheds light on how internet-enabled devices (laptops, tablets, and smart phones) transform contemporary university lectures into a battleground for divided attention. Glass and Kang's study employed an innovative design: a two-section college course where electronic devices were permitted in half of the lectures but not in the other half. This within-student, within-item counterbalanced experimental setup revealed surprising results. While immediate comprehension of lecture material, as assessed by in-class quizzes, appeared unaffected using electronic devices, their long-term impact told a different story. The findings showed that splitting attention between an electronic device and the classroom significantly slowed down students' retention of the material. When unit exams and final exams arrived, students who had used devices during lectures performed notably

worse. This indicates that while multitasking may not disrupt surface-level understanding, it undermines the deeper cognitive processes required for long-term retention and meaningful learning.

Glass and Kang's findings are part of a larger body of research highlighting the challenges posed by personal technology in the classroom. Numerous studies underscore the pervasive issue of digital distractions. For instance, Fried (2008) and Wood et al. (2012) demonstrate that the presence of electronic devices provides students with unrestricted access to a myriad of distractions, from social media and games to online shopping and texting. When cognitive resources are diverted to these activities, the mental capacity available for engaging with lectures and discussions diminishes significantly. Moreover, the effects of digital technology usage extend beyond individual users. Aguilar-Roca, Williams, and O'Dowd (2012) found that the use of devices can disrupt not only the focus of the user but also those seated nearby, creating a domino effect that erodes the overall learning environment. Even lecturers are not immune to this disruption, as the collective distraction in the room can subtly undermine their ability to deliver content effectively. This broader misdirection of resources highlights the communal nature of attention within a classroom setting.

These findings, I insist to my students, should make us rethink attention not only as an individual capacity but as a shared, collective resource. In a lecture room where no one is using digital devices, the collective focus creates a richer and more immersive learning environment. This collective experience elevates the classroom dynamic from being a mere sum of individual efforts to a unified pedagogical endeavour. Students are not just passive recipients of information but active participants in a communal intellectual journey. For example, a lecture on a challenging philosophical concept can become an exercise in shared intellectual discovery when every student is fully present and engaged. The absence of digital distractions fosters an atmosphere of mutual attentiveness, where questions are more thoughtful, discussions more robust, and insights more profound. Such an environment not only enhances individual learning but also cultivates a sense of academic camaraderie and intellectual solidarity.

Some critics argue that banning devices might hinder accessibility for students who rely on them for note-taking or other accommodations. While this is a valid concern, it can be addressed through nuanced policies. For instance, students with documented needs can be allowed to use devices under specific guidelines to ensure that their use remains focused and non-disruptive. Another common objection is that prohibiting devices may be perceived as regressive in a digital age where technology permeates every aspect of life. However, this perspective overlooks the distinction between thoughtful integration and uncritical adoption of technology. The lecture or seminar rooms are unique spaces that prioritize deep learning over convenience or speed. By framing the prohibition as a deliberate pedagogical choice rather than a rejection of technology, we as lecturers can help university students understand its value.

Beyond immediate academic benefits, the practice of sustaining attention in a device-free environment has broader implications for students' personal and professional lives. In an era characterized by constant notifications and information overload, the ability to focus deeply is a rare and valuable skill. By encouraging students to "treasure their attention," we equip them with the tools to navigate complex challenges in their future careers and personal endeavours. For instance, students who learn to engage deeply with a dense academic text without the crutch of digital shortcuts are better prepared to tackle complex problems in professional settings. Similarly, the habit of sustained focus cultivated in a lecture room can translate into more meaningful personal interactions and a greater capacity for self-reflection.

We are facing a pivotal moment in determining the role of digital technologies in university education. The evidence is quite clear: while digital tools have their place, their uncritical use can erode the quality of learning and undermine the communal nature of the university classroom experience. By prioritizing attention and fostering a device-free learning environment, we affirm the enduring value of focused intellectual engagement. This principle (to treasure attention) is not merely a guideline for group management but a cornerstone of educational philosophy at universities. It reminds us that the goal of education is not just to impart knowledge but to cultivate the habits of mind that enable students to engage deeply, think critically, and act responsibly. In preserving this principle, we uphold the true essence of university education and its promise to shape thoughtful, attentive, and capable individuals

2nd Principle: Faster is Rarely Better

The second principle I emphasize to my students is that slowing down their note-taking process, by using pens or pencils instead of typing on laptops, can profoundly enhance the quality of their learning. While laptops are ubiquitous in modern lecture and seminar rooms and appear to be a more efficient way to take notes, the evidence suggests otherwise. Slower, deliberate notetaking encourages deeper engagement with material, allowing students to make the most of their academic efforts.

One of the foundational studies that I introduce to my students is Pam A. Mueller and Daniel M. Oppenheimer's groundbreaking research, *The Pen Is Mightier Than the Keyboard: Advantages of Longhand Over Laptop Note Taking*. Published in the *APA journal,* this research investigates the effectiveness of traditional longhand note-taking versus laptop-based notetaking in educational contexts. As laptops became increasingly prevalent in classrooms, Mueller and Oppenheimer questioned their impact on students' ability to process and retain information. Through three experimental studies, they uncovered striking differences in the cognitive outcomes associated with these two approaches. Their findings showed that while laptops allowed students to take more extensive notes, this advantage was counterbalanced by the nature of the notes them-

selves. Laptop users were more likely to transcribe lectures verbatim, capturing everything said, but engaging in minimal processing of the material. In contrast, students who took longhand notes adopted a more selective approach, rephrasing and summarizing the content in their own words. This process of synthesis introduced a desirable level of cognitive challenge, leading to improved comprehension and retention of the material.

Mueller and Oppenheimer's research underscores an important pedagogical insight: the act of reframing and condensing lecture material forces students to think critically and meaningfully about what they are learning. This deeper level of engagement contrasts sharply with the superficial encoding that often accompanies laptop-based notetaking, where the focus is on speed and volume rather than understanding. The advantages of longhand note-taking are supported by a broader body of research in cognitive psychology. For example, studies by Hembrooke and Gay (2003) and Morehead et al. (2019) highlight how the use of laptops during lectures often leads to shallower cognitive processing. Students who type their notes tend to record information verbatim, a strategy that prioritizes capturing as much information as possible over understanding it. While this might seem like a prudent approach, it ultimately undermines the depth of learning. In contrast, handwritten notes require students to process the lecture material in real-time, identifying key concepts and rephrasing them in their own words. This process engages multiple cognitive functions simultaneously (listening, analysing, summarizing, and writing) creating a richer and more integrated understanding of the material. As a result, students who take longhand notes consistently outperform their laptop-using peers on tests measuring conceptual understanding and long-term retention.

One of the key mechanisms underlying the benefits of longhand note-taking is the depth of cognitive engagement it fosters. When students transcribe lectures verbatim on laptops, they bypass the opportunity to engage deeply with the material. This approach may help them capture every detail of a lecture, but it comes at the expense of critical thinking and meaningful learning. By contrast, the process of handwriting notes demands active decision-making. Students must decide what information is most important, how to condense it, and how to structure it in a way that makes sense to them. This active engagement not only enhances comprehension but also strengthens memory consolidation, enabling students to recall and apply the material more effectively in the future.

Despite the evidence supporting the benefits of longhand note-taking, many students initially resist this approach. They often perceive laptops as faster and more efficient tools for capturing information. While it is true that laptops allow for greater speed and volume, this efficiency is misleading. The quantity of notes does not equate to the quality of learning. In fact, the very speed and ease of typing can undermine the mental effort required for meaningful understanding. Another common misconception is that longhand note-taking is outdated or impractical in the digital age. However, this per-

spective overlooks the enduring value of analogue practices in fostering deeper cognitive engagement. The act of writing by hand is not merely a nostalgic throwback; it is a powerful pedagogical tool that aligns with the principles of effective learning.

The benefits of slowing down and embracing handwritten notetaking extend beyond the classroom. In an era characterized by constant information overload, the ability to process information deeply and thoughtfully is a critical skill. Students who develop this habit are better equipped to navigate complex professional challenges, engage in meaningful personal reflection, and contribute thoughtfully to their communities. For instance, a student who learns to distil a dense lecture into a set of concise, well-organized notes is likely to approach workplace tasks with similar efficiency and clarity. Similarly, the practice of slowing down and focusing on key ideas can enhance personal interactions, fostering greater empathy and understanding. The principle that "faster is rarely better" serves as a reminder that good learning is not a race. By encouraging students to embrace the slower, more deliberate practice of handwritten notetaking, we help them cultivate habits of mind that prioritize depth over speed, understanding over mere accumulation of information. This principle is not just about note-taking; it is about fostering a mindset that values thoughtful engagement and meaningful learning. In a world that often prioritizes efficiency and multitasking, the practice of writing by hand offers a powerful counterbalance. It reminds us that the most profound insights and understandings are often the result of deliberate, sustained effort.

3rd Principle: Digital does not Equal more Sustainable

Evidence strongly suggests that paper-based reading offers significant advantages for academic success, including improved retention and comprehension. These benefits are largely attributed to the absence of digital distractions, such as email, social media, and notifications, which frequently disrupt focus during screen-based reading. By examining key research studies, we can better understand why paper remains an invaluable medium for learning. To illustrate this principle to my students, I draw on two landmark review studies that offer compelling evidence for the advantages of reading on paper over screens.

The first study, conducted by Pablo Delgado and colleagues and published in *Educational Research Review*, is titled *Don't Throw Away Your Printed Books: A Meta-analysis on the Effects of Reading Media on Reading Comprehension*. It examines how the medium of reading affects comprehension; especially as digital reading becomes more prevalent. The study synthesizes research conducted between 2000 and 2017, comparing learning outcomes when equivalent texts are read on paper versus digital devices. Delgado's analysis encompasses 54 studies involving a total of 171,055 participants, with both between-participants (38 studies) and within-participants designs (16 studies). Remarkably, the results consistently highlight the advantage of paper-based reading over digital reading. They identify three moderating factors that influence these

outcomes: (a) Time frame: the paper-based reading advantage was most pronounced in time-constrained scenarios, where readers needed to absorb information quickly. In contrast, this advantage diminished in self-paced reading settings, where readers could take their time. (b) Text genre: the advantage of paper-based reading remained significant when informational texts or mixed genres (informational and narrative texts) were used. However, the benefits were less evident in studies that exclusively employed narrative texts, suggesting that the type of material may moderate the effectiveness of the reading medium. (c) Publication year: interestingly, the advantage of paper-based reading has grown over time, as more studies confirm its benefits. This trend may reflect the increasing cognitive challenges posed by digital media, which exacerbates the difficulties associated with screen-based reading. Delgado's work provides a robust foundation for arguing that paper-based reading is not just a nostalgic preference but a demonstrable advantage for comprehension, especially in academic contexts.

The second study, authored by Virginia Clinton and published in the Journal of Research in Reading, complements Delgado's findings. Clinton's systematic review and meta-analysis examines how reading medium affects reading performance, reading time, and metacognitive accuracy, that is, readers' ability to judge their own comprehension. Clinton's analysis includes 33 individual studies published between 2008 and 2018, all employing random assignment and involving participants with fundamental reading skills. The findings reveal several key insights: (a) Reading performance: screen-based reading consistently resulted in poorer performance compared to paper-based reading. This disadvantage was particularly evident when reading expository texts (designed to explain or inform), although it was less pronounced for narrative texts. (b) Metacognitive calibration: readers demonstrated better-calibrated judgments of their performance when reading from paper. This means they were more accurate in assessing how well they had understood and retained the material. In contrast, screen-based readers often overestimated their comprehension, leading to a false sense of confidence. (c) Reading time: surprisingly, there were no significant differences in reading time between the two mediums. However, the qualitative differences in comprehension and metacognition underscore the superiority of paper-based reading for deep learning.

One of the primary reasons paper-based reading outperforms digital reading is its ability to eliminate the distractions inherent in digital devices. Digital screens expose readers to a constant stream of potential interruptions (emails, social media notifications, and other alerts) that fragment attention and disrupt the immersive focus required for comprehension. Even when such distractions are minimized, the very nature of screens can hinder learning. For instance, scrolling and hyperlinks often fragment the reading experience, making it harder to build a coherent understanding of the material. In contrast, paper-based reading fosters sustained focus. The tactile engagement of turning pages, the lack of digital interruptions, and the stable visual layout all contribute to

a deeper and more cohesive reading experience. These advantages are particularly critical in academic settings, where comprehension and retention are vital. The concept of metacognitive calibration (a reader's ability to accurately judge their own understanding) is a crucial factor in academic success. Clinton's research demonstrates that paper-based readers are better calibrated in their self-assessments. This means they are more likely to identify gaps in their understanding and take steps to address them. In contrast, screen-based readers often overestimate their comprehension, leaving them ill-prepared for exams or assignments. This miscalibration can have significant academic consequences. For example, a student who assumes they have mastered a text after skimming it on a screen may fail to engage in the deeper study required for true understanding. In contrast, the deliberate pace and tactile engagement of paper-based reading encourage students to approach texts more thoughtfully, fostering both comprehension and critical thinking. A common argument in favour of digital reading is that it is more sustainable than paper. While this perspective has merit in terms of reducing physical waste, it overlooks the broader context of sustainability in education. True sustainability encompasses not only environmental considerations but also the cognitive and educational outcomes that support long-term learning.

By prioritizing digital reading at the expense of comprehension and retention, we risk undermining the very purpose of university education. Paper-based reading, with its proven advantages for academic success, represents a more sustainable form, one that values intellectual growth and the cultivation of deep understanding. I would like to invite other faculty members to promote the benefits of paper-based reading in their classrooms in a similar way like I do. First, they can provide printed materials for key readings and encourage students to engage with them without the distractions of digital devices. Second, they can explicitly teach the advantages of paper-based reading, drawing on studies like those by Delgado and Clinton to build students' understanding of why this approach works. Finally, they can model paper-based reading practices themselves, demonstrating the value of sustained focus and deep engagement. By fostering a culture that values paper-based reading, university lecturers can help students develop habits that will serve them well throughout their academic and professional lives. The principle that "digital does not equal more sustainable" challenges the assumption that digital technology always represents progress. While digital tools have their place, the evidence overwhelmingly supports the benefits of paper-based reading for academic success. By eliminating distractions, fostering metacognitive accuracy, and supporting deeper comprehension, paper remains an indispensable medium for learning. As university lecturers, we might consider advocate for practices that prioritize meaningful learning outcomes, ensuring that the tools we use align with the goals of university education itself.

Final Remarks

Recent innovations amongst European universities, emphasizing active learning and transferable skills. These changes have enriched educational practices, equipping students with competencies relevant to contemporary professional demands. However, these advancements might be complemented by a renewed emphasis on intellectual rigor. University education requires a careful balance between fostering practical skills and cultivating deep thinking, ethical reflection, and intellectual autonomy. This equilibrium is not only desirable but needed for preparing students who can navigate the complexities of their eventual professional and personal lives. But the unproblematized rise of digital tools in university education presents challenges. Digital technologies have undoubtedly enhanced accessibility and collaboration, enabling new modes of teaching and learning. Yet, its pervasive influence also risks diluting the depth and quality of academic study practices. To address this tension, university lecturers whenever possible and as much as possible might consider adopt a highly selective approach to those digital technologies. By integrating digital tools in ways that support rather than supplant analogue practices, universities can preserve the richness of intellectual engagement while embracing innovation.

I have proposed guerrilla tactics, as a metaphor for localized and adaptive strategies, offer a compelling framework for resisting the pressures of technological determinism. These tactics, which I have framed around three main principles, may enable lecturers to reclaim their pedagogical autonomy by prioritizing intellectual depth and context-sensitive approaches. For example, prohibiting electronic devices during class and promoting handwritten notes are small but impactful measures that foster focus and cognitive engagement. More broadly, embedding analogue practices into curricula (framing them as innovative enhancements rather than outdated relics) can challenge the dominance of standardization and efficiency-driven methodologies. Reaffirming the importance of analogue practices is not an act of resistance for its own sake but a commitment to the enduring values of university education. Universities should not be merely institutions for skill acquisition but spaces for cultivating thoughtful inquiry, study, thinking, and engagement. Analog practices, such as deep reading, attentive listening, and reflective writing, serve as vital counterpoints to the superficiality often associated with digital learning. These practices nurture important qualities for responsible teaching and meaningful learning: attention, depth, and intellectual discovery.

The struggle to preserve analogue practices reflect broader tensions in contemporary university pedagogical practices. In a culture increasingly oriented toward utility and employability, content-centred lecturing rooted in rigorous intellectual practices offers a necessary counter-narrative. By focusing on ideas and concepts rather than metrics and outputs, university lecturers can inspire students to think critically and engage

more deeply with their studies. I find this approach is particularly relevant in teacher education, where the moral and intellectual dimensions of teaching might be foregrounded alongside more technical competencies.

Resistance to analogue practices is inevitable. Students accustomed to digital convenience may question the rationale for handwriting notes or reading printed texts. Institutional pressures to adopt standardized frameworks may further complicate efforts to preserve analogue methods. However, these challenges underscore the importance of articulating clear, evidence-based arguments for the value of analogue practices. Empirical research on the benefits of handwritten notes, paper-based reading, and distraction-free environments provides a strong foundation for these arguments. Coupled with philosophical reflection on the purposes of a university education, such evidence forms a robust defence against the push for technological conformity. As lecturers, we might consider reject the false equivalence of progress with digitization and instead prioritize quality over expedience and understanding over information. By embracing tactics that emphasize intellectual depth and thoughtful engagement, we can pave the way for a more reflective and dynamic academic future. Analog practices, far from being outdated, remain vital elements of a university education that values depth, attention, and creativity. To preserve the essence of university education, we should rather advocate for practices that foster meaningful learning and serious inquiry. Let us take up this responsibility with conviction, ensuring that the university remains a space for thoughtful study opportunities and intellectual adventures.

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