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RE-DISCOVERING THE POSTDIGITAL: THE CASE OF HIGH SCHOOL LEARNERS AT A PRIVATE SCHOOL IN ASTANA, KAZAKHSTAN

Master's Thesis

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Abstract
This study explores how high school students at a private school in Astana, Kazakhstan experience learning in a postdigital environment. Drawing on postdigital theory and connected learning, the research investigates how students engage with digital tools across formal and informal contexts. Using a qualitative case study approach, data were collected through semi-structured interviews and reflective journals. Thematic analysis revealed key patterns of digital dependency, cognitive overload, and a nuanced negotiation between digital and traditional learning methods. The findings contribute to a deeper understanding of how adolescents navigate blended educational realities, offering insights for educators and policymakers seeking to develop more responsive digital learning environments.

Keywords: *postdigital learning, digital dependency, cognitive overload, connected learning, Kazakhstan, adolescents, blended education*

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Re-discovering the Postdigital: The Case of High School Learners at a Private School in Astana, Kazakhstan

In the 21st century, digital technology has become an inseparable part of daily life, reshaping how people interact, learn, and engage with information (Berry, 2014). The term *postdigital*, originally conceptualized by Florian Cramer (2014), challenges the outdated idea of a strict divide between digital and non-digital experiences. Instead, it acknowledges that digital technology is now seamlessly embedded into everyday routines, rather than existing as a separate, disruptive force. This shift makes it crucial to explore how individuals, particularly high school students, experience education in this postdigital era.

In Kazakhstan, education has undergone a major digital transformation, particularly in private schools, which often have better access to technology than public schools (Chankseliani & Silova, 2018). High school students in these institutions navigate an educational landscape where digital tools are deeply integrated into their learning experiences. However, there is still much to understand about how students perceive and engage with postdigital education—what challenges they face, how they balance digital and traditional learning, and how they shape their own learning behaviors within this hybrid framework.

This transformation did not occur in isolation. Kazakhstan's *Digital Kazakhstan* initiative, launched in 2017, aimed to boost digital literacy, infrastructure, and access to online resources at all levels of society, including education (Chankseliani & Silova, 2018). While the initiative has led to widespread adoption of platforms like Google Classroom, Zoom, and Moodle in private schools, it has also revealed stark inequalities in access, digital literacy, and pedagogical support (Bozkurt et al., 2020). In many classrooms, technology is introduced faster than teaching practices are reformed, resulting

in what Selwyn (2021) calls the “implementation gap”—a disconnect between digital presence and meaningful learning outcomes.

As a teacher at a private school in Astana, I have personally observed how students interact with technology in both academic and non-academic settings. One of the most striking observations I have made is how deeply dependent students have become on their smartphones. These devices are not just tools for learning; they are an inseparable part of their social lives and daily routines. I have witnessed students struggling to concentrate in class because of the constant need to check notifications, and I have seen them use smartphones in ways that both enhance and hinder their academic progress. From using AI-powered tools for assignments to engaging in mindless scrolling on social media during lessons, students exhibit a complex relationship with digital technology. This first-hand experience has strengthened my belief that the postdigital condition is not just a theoretical construct but a lived reality for adolescents who may find it difficult to imagine life without digital connectivity.

Globally, discussions around postdigital education have moved beyond the simple question of whether digital tools should be used in learning. Scholars like Jandrić et al. (2018) argue that we need to focus on how students interact with technology in ways that influence their cognitive and social development. Similarly, OECD (2020) warns that technology in education must be accompanied by pedagogical changes and support systems, or it risks becoming a superficial add-on rather than a true learning enhancer. In postdigital settings, students are not just users—they are interpreters, co-creators, and even resisters of the technologies that shape their educational experience.

Kazakhstan’s educational reform efforts increasingly emphasize global competitiveness, yet there remains a need to understand how digital policies translate into everyday student experiences. While private schools may be leading the way in digital

adoption, students' experiences, attitudes, and usage patterns vary widely. Understanding these nuances requires a closer examination of how students engage with digital tools beyond just having access to them.

Research Problem and Rationale

Although the use of digital technology in education is almost universal, little research has been done on how this affects high school students in Central Asia and how they understand learning in a postdigital world (Nurgaliyeva et al., 2024). Most of the discussions concerning digital learning are based on how the technology is implemented, but very few pay attention to how the students themselves contribute to the construction of their learning processes in the digital environment.

This study is an attempt to fill this gap by analyzing the perceptions of high school students attending a private school in Astana, Kazakhstan. Through studying their attitudes towards digital learning, this research helps to enrich the debate on postdigital education, and specifically, how digital and non-digital elements combine in today's learning environments.

Kazakhstan is striving to align its education system with global standards, making it an interesting case for studying postdigital learning (Manan et al., 2023). Investigating how students perceive and use digital tools can offer insights into whether current policies and teaching methods truly support their needs. Additionally, this research explores whether students find digital learning empowering or overwhelming, as the phenomenon of digital fatigue has been increasingly observed in high school education worldwide.

This study will also take into account the social and psychological aspects of digital learning among adolescents. The postdigital world blurs the boundaries between schoolwork, entertainment, and social interactions, potentially making it difficult for students to manage digital distractions, stay motivated, and balance screen time with deep

learning. These challenges highlight the importance of critically analyzing how digital education affects both academic outcomes and student well-being.

Digital technology in education is no longer a temporary disruption—it is a normalized, expected component of modern schooling, particularly in private educational institutions (Manan et al., 2024). However, what remains underexplored is how this normalization affects students' subjective learning experiences. According to Jandrić et al. (2018), the postdigital era is not defined by the novelty of technology but by the saturation of it. When everything is mediated through screens, even traditionally "non-digital" learning moments, like asking a question in class, can occur via a device, platform, or asynchronous message.

The question is no longer whether students are using digital tools, but how these tools shape the ways they think, organize knowledge, regulate emotion, and form identities in learning contexts. As Selwyn (2021) notes, educational research often focuses on the policy and infrastructure side of digital education, while leaving out students' lived realities—the very place where learning occurs. This study seeks to center those realities.

Kazakhstan, as a nation in educational transition, offers a unique setting for exploring postdigital conditions. It has embraced digital reforms under initiatives like "Digital Kazakhstan," yet many of its pedagogical practices remain heavily influenced by traditional didactic models. This creates a hybrid learning culture where digital tools exist alongside enduring teacher-centered norms. How students respond to this blend is an open question—and one with implications for both policy and pedagogical design.

Furthermore, the psychosocial costs of ubiquitous tech use among adolescents are becoming increasingly visible. Studies have linked excessive screen exposure to increased anxiety, attention fragmentation, and burnout (Bozkurt et al., 2020; Montag & Diefenbach, 2018). In this sense, postdigital education is not only a pedagogical shift but a well-being

challenge. Students today are asked to be digitally competent, self-regulated, socially connected, and emotionally resilient—all at once, and often without adequate support.

By investigating student perspectives, this study contributes to rethinking how educational practices are shaped in postdigital contexts, especially in under-researched regions like Central Asia. Rather than offering a prescriptive model of educational design, it aims to inform a more human-centered reflection on how digital and non-digital elements are experienced by learners. In doing so, the study contends that the student experience, not the technology itself, should guide future educational innovation.

Research Questions

In line with the research problem and theoretical framing, this research is guided by five central research questions. These questions aim to uncover how students conceptualize and live out their learning within postdigital environments, particularly in a high-tech private school in Kazakhstan. Each question is grounded in both the postdigital framework (Cramer, 2014; Jandrić et al., 2018) and connected learning theory (Ito et al., 2013), which together emphasize the seamless integration of digital and non-digital practices, the influence of peer culture, and the importance of learner agency in networked educational spaces.

1. How do high school learners in a private school in Astana conceptualize and experience postdigital learning?
2. What challenges and opportunities do students perceive in a postdigital learning environment?
3. How do students navigate their engagement with digital tools in both formal and informal learning spaces?
4. How does digital integration impact students' motivation, cognitive load, and overall academic engagement?

5. To what extent do students differentiate between digital and non-digital learning experiences in their daily academic routines?

The first research question seeks to establish a foundational understanding of how students perceive and define their learning experiences in a context where digital tools are omnipresent. This question lays the groundwork for subsequent inquiry and is rooted in the assumption that student definitions of "learning" may differ significantly from institutional or policy framings.

The second and third questions aim to unpack students' subjective experiences and behavioral patterns, both positive and negative, in postdigital spaces. They are designed to capture tensions between empowerment and fatigue, autonomy and distraction, innovation and overload. The inclusion of informal learning spaces—such as social media, messaging apps, and personal digital routines—reflects the growing recognition that much of adolescents' learning takes place beyond the formal classroom (Selwyn, 2021).

The fourth and fifth questions explore the psychological and cognitive dimensions of postdigital learning. Specifically, they investigate how digital saturation affects students' motivation, focus, and memory, as well as how they differentiate between screen-based and analog learning experiences. These questions are particularly relevant in light of growing research into digital fatigue and its impact on academic well-being (Bozkurt et al., 2020).

Together, these questions aim to construct a rich, multidimensional portrait of how adolescent learners engage with digital tools in their day-to-day academic lives. They are open-ended by design, allowing participants to share their interpretations, routines, and challenges in their own terms. This approach aligns with the qualitative and interpretive nature of the study and supports the development of theory-grounded yet context-sensitive findings.

Theoretical Overview

The Postdigital Framework

The concept of the postdigital moves beyond the idea that digital technology is a separate or external factor in learning. Instead, it argues that digital tools have become so embedded in everyday life that they are no longer seen as new or revolutionary (Berry, 2014). This study applies a postdigital perspective to examine how students in a private school engage with technology in ways that go beyond traditional ideas of "digital" and "non-digital" learning.

In a postdigital learning environment, digital tools do not replace traditional education but instead become deeply intertwined with it. This challenges the binary view of "online vs. offline" and instead suggests that modern education exists in a blended space where both digital and face-to-face interactions coexist (Cramer, 2014). This framework allows for an analysis of how students transition between digital and non-digital learning experiences, shaping their own postdigital educational ecosystems.

Recent scholarship has further developed the postdigital concept, emphasizing its implications for education in contexts where digital tools are normalized, yet unequally distributed. For example, Jandrić (2020) argues that postdigital education should not only describe blended realities, but also confront the sociopolitical consequences of digital saturation—such as datafication, platform dependency, and algorithmic influence. These concerns are particularly relevant in Kazakhstan, where private schools often adopt Western tech platforms without critical engagement with their broader impact on learner agency and autonomy.

Connected Learning Theory

Ito et al.'s (2013) Connected Learning Theory provides a useful framework for understanding how students learn in a postdigital world. Connected learning emphasizes

the importance of linking formal education, peer culture, and personal interests, showing how students use digital tools both in and outside the classroom. This theory helps explain how high school students in Kazakhstan integrate digital technologies into structured learning environments and informal, self-directed learning activities.

Connected learning suggests that learning is most effective when it is driven by personal interests, embedded in social relationships, and tied to real-world opportunities (Ito et al., 2013). This perspective will be used to explore how students extend their use of digital tools beyond academic requirements into their personal and social lives, further blurring the boundaries between structured and informal learning.

In post-Soviet contexts like Kazakhstan, the cultural relevance of connected learning becomes more complex. While students are digitally active, school systems may still follow rigid curricular traditions. This mismatch can cause tension between student-driven digital learning and teacher-led classroom expectations. Studies by Sefton-Green et al. (2020) show that connected learning thrives when there is institutional flexibility to integrate students' digital identities into formal education. This aspect remains underdeveloped in Kazakhstan's private schools, despite strong infrastructure.

Cognitive Overload and Digital Dependency

In addition to broader frameworks such as connected learning and postdigital theory, this study also draws on more targeted concepts such as cognitive overload and digital dependency. Cognitive overload refers to a state in which the demands placed on working memory exceed a learner's cognitive capacity, leading to reduced attention, comprehension, and learning efficiency (Mayer & Moreno, 2003; Sweller, 1994). In postdigital settings, this phenomenon can be intensified by constant notifications, multitasking, and the expectation to process large volumes of digital content in short periods (Bozkurt et al., 2020).

Relatedly, digital dependency describes a behavioral and emotional reliance on digital devices, particularly smartphones, which students use not only for academic purposes but also for social validation, entertainment, and passive consumption (Montag & Diefenbach, 2018). In the context of this study, these concepts were used as deductive codes to analyze how students manage, or struggle to manage, the cognitive and behavioral challenges of technology-saturated learning environments.

Digital Natives and Postdigital Learners

Marc Prensky's (2001) Digital Natives concept has long shaped discussions about how young people interact with technology. However, recent critiques argue that this framework oversimplifies student experiences and assumes a uniform level of digital fluency (White & Le Cornu, 2011). Instead of assuming that all students are naturally skilled with digital tools, this study examines how learners actively develop their own strategies for managing postdigital learning environments.

While Prensky (2001) characterized younger generations as inherently tech-savvy, more recent research suggests that digital literacy varies greatly, even among students who have grown up with technology. This study will investigate whether students truly possess the critical digital skills needed to thrive in a postdigital world, or whether gaps in digital literacy persist despite widespread technology use.

Critical Digital Pedagogy

Another key theoretical lens is Critical Digital Pedagogy, which encourages educators to question the power structures embedded in educational technologies. According to Stommel (2014), digital tools are never neutral; they carry the values and assumptions of their creators and institutions. Applying this lens to Kazakhstan's digitally rich private schools raises questions about whether technology empowers students or simply reinforces passive content consumption. This study adopts elements of critical

digital pedagogy to interrogate the ways students both resist and adapt to the norms shaped by their digital learning environments.

Bridging Theory to Research

Together, these frameworks—postdigital theory, connected learning, digital fluency critiques, and critical digital pedagogy—form the analytical foundation of this study. They allow for a multidimensional view of how students experience technology not just as a tool, but as an embedded part of their identity, agency, and educational practice. Understanding these dynamics is crucial in assessing how students in Kazakhstan's private schools conceptualize learning in a postdigital age.

Method

Research Design

This study employs a qualitative research design to explore how high school students at a private school in Astana conceptualize and navigate postdigital learning environments. A case study methodology was selected as it allows for an in-depth investigation of a specific, bounded context, aligning with the study's aim to understand lived experiences and social processes (Merriam, 2009; Yin, 2018). This design supports an interpretive approach that focuses on meaning-making, reflection, and nuanced descriptions of behavior and perceptions.

Sample

The study was conducted at a private secondary school in Astana, Kazakhstan, where the researcher is currently employed as a test prep instructor. Purposeful sampling was used to recruit participants who are likely to provide rich and relevant insights into the phenomenon under investigation. The sample consists of 12–15 high school students (ages 15–18) across Grades 10 and 11 who are actively engaged with digital tools for both academic and personal purposes (Palinkas et al., 2015).

Inclusion criteria comprised regular attendance at the school, experience using school-supported digital platforms (e.g., Google Classroom, Kahoot, educational apps), and informed consent from participants and their legal guardians. The participants represent diverse academic profiles and digital fluency levels to capture a broad range of experiences.

Data Collection

Data was collected through two primary methods: semi-structured interviews and participant journals.

Interviews: Each participant took part in a one-on-one semi-structured interview lasting approximately 30–45 minutes. The interviews included open-ended questions designed to elicit student perspectives on their use of digital tools, perceptions of postdigital learning, challenges encountered, and ways of managing learning in blended environments. Interviews, in general, are well-suited to qualitative research as they enable the researcher to explore participants' individual understandings and interpretations in depth (Kvale & Brinkmann, 2009). The interviews were audio-recorded with permission and transcribed verbatim for analysis.

Participant Journals: In addition to interviews, participants were asked to maintain a reflective journal for one week, documenting their daily interactions with digital tools in both academic and non-academic settings. Reflective journaling is a valuable qualitative instrument that encourages participants to engage in ongoing self-reflection, thus producing rich, introspective data (Ortlipp, 2008). Prompts were provided to encourage consistent and thoughtful entries. This method is intended to capture real-time reflections and supplement interview data with deeper contextual understanding.

These data collection methods were selected to ensure depth and richness of information. The use of both interviews and reflective journals supports methodological triangulation, enhancing the credibility and trustworthiness of the findings (Denzin, 1978).

Data Analysis

Thematic analysis was employed to analyze the collected data. Following Braun and Clarke's (2006) six-step framework, the process involves:

1. Familiarization with the data (reading and re-reading transcripts and journal entries)
2. Generating initial codes
3. Searching for themes
4. Reviewing themes
5. Defining and naming themes
6. Producing the final report

NVivo software was used to assist with data organization and coding. Codes and themes will be developed both inductively from the data and deductively based on the theoretical framework (Postdigital Theory and Connected Learning).

To enhance reliability, member checking was employed, where participants were invited to review interview transcripts and emerging findings for accuracy (Lincoln & Guba, 1985). Reflexive memos were maintained throughout the research process to ensure the researcher remains aware of personal biases and positionality (Creswell & Poth, 2018).

Thematic analysis was used to interpret the qualitative data collected through interviews and journals, following Braun and Clarke's (2006) six-phase approach. The researcher began by transcribing the interviews verbatim and reading through the journal entries multiple times to gain an in-depth familiarity with the content. Initial codes were

generated manually and later refined with the help of NVivo software, which allowed for systematic organization and comparison of codes across participants.

Both inductive and deductive coding strategies were employed. Deductively, the researcher was guided by theoretical concepts such as digital dependency, cognitive overload, and connected learning. For instance, a deductive code like “screen fatigue” was used to tag recurring statements related to emotional or cognitive exhaustion. Inductively, codes emerged directly from participant language and patterns, such as “silent scrolling” or “study with music,” which reflected subtle routines not explicitly addressed in the literature.

NVivo was particularly useful for clustering similar codes and generating visualizations like word frequency clouds and code co-occurrence matrices, which helped identify overlapping patterns in how students described their digital practices. Through this process, three major themes emerged: (1) Integration and dependency on digital tools, (2) Challenges associated with digital overload, and (3) Students’ negotiation between digital and traditional methods.

The coding framework was iteratively revised, and theme definitions were written to clarify their boundaries and internal coherence. To ensure the credibility of findings, member checking was employed—several participants reviewed their interview transcripts and verified the accuracy of thematic summaries. Reflexive memos were kept during the entire process to help the researcher remain aware of their own assumptions and to track shifts in analytical perspective.

Ultimately, this hybrid coding approach and structured thematic analysis enabled a nuanced, theory-informed, and participant-centered interpretation of postdigital learning experiences.

Research Ethics

Ethical approval was obtained from the school's ethics committee prior to data collection. Participation was voluntary, and informed consent was secured from both students and their parents or legal guardians, as some participants are minors. Pseudonyms were used to ensure confidentiality, and all data was stored securely with access limited to the researcher only.

Participants were informed of their right to withdraw at any point without penalty. Given the power dynamics between the researcher (as a teacher) and the students, steps were taken to minimize coercion, including recruitment by a neutral third party and scheduling interviews outside of regular classroom instruction. The well-being and autonomy of all participants remained a central concern throughout the research process.

Results

This section presents the core findings of the study, structured around the five research questions. The themes were developed through a combination of inductive and deductive coding and reflect consistent patterns in how students described their engagement with postdigital learning across both formal and informal contexts.

The analysis of interview transcripts and reflective journal entries yielded a rich understanding of students' lived experiences with postdigital learning. Five key research questions guided the thematic analysis, and three interrelated themes emerged:

1. Integration and dependency on digital tools
2. Challenges associated with digital overload
3. Negotiation between digital and traditional learning methods

These themes were developed through a combination of inductive and deductive coding, and they reflect patterns in students' reported experiences across both formal and informal learning settings. Each theme is presented below with illustrative quotations.

Integration and Dependency on Digital Tools

Participants consistently described digital tools as essential to their academic routines. Many reported feeling inseparable from platforms such as Google Classroom or various mobile apps used for schoolwork. One participant remarked,

"Every time I open my school bag, my phone is the first thing I take out. Even before my notebook. It's where my schedule, homework, and even my friends are."

Another shared,

"I use Google Classroom so often that I don't even think about it. It's just there, like breathing."

Reflective journals also demonstrated this dependency, with students recording frequent daily use of digital tools for assignments, collaboration, and communication. While students appreciated the convenience, several also described it as a source of anxiety. One student wrote,

"If my phone dies, I feel panicked. Not because of social media, but because I can't access my homework or join the Zoom class."

Challenges of Digital Overload

Many students reported emotional and cognitive fatigue from continuous digital exposure. Journals and interviews revealed recurring mentions of tiredness, stress, and difficulty concentrating due to constant screen use and notifications. One participant stated,

"I get tired just looking at screens all day, and by evening, it's hard to concentrate on anything meaningful."

Another described the experience of multitasking fatigue:

"I scroll through school messages and feel overwhelmed—there's always something due, always a message to reply to."

One student highlighted the difficulty of managing stress related to digital tools:

"I know how to use the apps, but nobody teaches us how to manage stress from them. We're just expected to handle it."

Negotiation Between Digital and Traditional Learning Methods

Students showed a strong awareness of when digital or traditional methods were most helpful for their learning. Many used digital tools for speed, access, or collaboration, while choosing paper or analog tools for memory retention or focus. One participant shared,

"If it's something I need to remember, I write it out by hand. If it's just a quick assignment, I use my phone."

Another noted,

"For math and physics, I always print out the worksheets. I can't concentrate on screen-based problems."

Reflective journal entries also indicated deliberate disconnection from devices during exam preparation. One student wrote,

"Before finals, I delete Instagram and only study from my notebook. Otherwise, I just waste time."

Students repeatedly described switching between modes based on task complexity, setting, and mental state.

Discussion

The findings from this study offer a complex portrait of how high school students in a private school in Astana navigate their learning in a postdigital environment. While the Results section outlined the themes that emerged from the data, this Discussion interprets those findings through the theoretical lenses presented earlier—particularly

Postdigital Theory (Cramer, 2014), Connected Learning (Ito et al., 2013), Cognitive Overload (Sweller, 1994), and Digital Dependency (Montag & Diefenbach, 2018).

Postdigital Integration as a Norm, Not a Choice

The theme of deep integration and dependency on digital tools confirms Cramer's (2014) notion of the "postdigital"—a state where digital technologies are no longer novel or optional, but ambient and embedded. Students' remarks about phones being their "first tool" or "as natural as breathing" illustrate this shift. The invisibility of technology, where its use fades into the background yet remains functionally essential, aligns with postdigital theory's critique of simplistic digital / non-digital binaries. For students in this study, digital tools are not enhancements to learning—they are the infrastructure of learning.

Yet, this embeddedness raises questions about autonomy. When students described panic when disconnected, or anxiety at missing updates, they revealed an emotional entanglement with digital systems that transcends utility. This reinforces the idea that postdigital learning is not just technologically saturated, but also psychologically loaded.

The Cognitive Toll of Digital Saturation

The challenges reported by the students, such as fatigue, stress, distraction, mirror growing global concerns about cognitive overload in tech-enhanced environments (Bozkurt et al., 2020). According to Sweller's Cognitive Load theory (1994), learning suffers when students must process excessive information across fragmented digital channels. Students' comments about multitasking, information "black holes," and feeling mentally drained after extended screen time illustrate this exact effect.

In particular, the theme of digital fatigue echoes Jandrić et al.'s (2018) argument that digital education can erode attention and well-being when left unregulated. The emotional dimension is crucial: students in this study did not just describe logistical or

organizational challenges—they described emotional exhaustion from over-engagement with technology.

This suggests that postdigital learning environments must be not only digitally equipped, but also cognitively humane. Teachers and curriculum designers must balance immediacy and engagement with mental pacing and recovery time, especially in screen-heavy classrooms.

Connected Learning in Action—But Not Uncritically

Students showed thoughtful self-regulation when navigating between tools and methods. This directly reflects principles of connected learning (Ito et al., 2013), which emphasize student agency, interest-driven learning, and flexible tool use across contexts. The findings suggest that students are not passive recipients of screen-based content; they switch intentionally between Google Docs and notebooks, between collaborative online tools and solo paper-based study. This kind of adaptability is the hallmark of a postdigital learner.

However, this also shows that even "digital natives" (Prensky, 2001) are not fully digitally inclined. Many participants favored handwritten notes or printed materials for tasks requiring focus and memory. This challenges simplistic assumptions about student preferences and supports White & Le Cornu's (2011) argument that digital identity is fluid, negotiated, and context-dependent.

Postdigital Learning as an Emotional Landscape

Beyond the practical issues of tool use, this study shows that postdigital learning is an emotional landscape shaped by empowerment, stress, autonomy, and fatigue. Students voiced appreciation for the affordances of technology—but also frustration at its pervasiveness and emotional cost.

This duality reinforces the need to see postdigital education not as a question of tool effectiveness, but as a complex experience that blends infrastructure, identity, cognitive demand, and emotional response. Students toggle between modes, not only because of the task, but because of how it makes them feel—whether connected or exhausted, empowered or anxious.

Concluding Reflections

The findings of this study suggest that postdigital learners are not just navigating tools—they are navigating tension. Their learning spaces are hybrid, their routines are layered, and their cognitive experiences are shaped by overlapping demands. The results invite educators, especially in contexts like Kazakhstan's private schools, to think beyond "tech integration" and toward human-centered digital practices that prioritize well-being, motivation, and meaningful learning.

This discussion also highlights how the postdigital is not a future vision—it is a present reality, and one that demands thoughtful reflection, responsive design, and critical pedagogy.

Positionality

As a teacher at a private school in Astana, I occupy a dual role as both an insider to the school culture and an external investigator of students' learning experiences. This position provides me with deep contextual understanding of the school's digital practices, but it also requires careful reflection to minimize potential bias. My proximity to the participants, while offering trust and rapport, could influence how students express themselves in interviews or journals.

To address this, I maintained a conscious effort to separate my assumptions from the analysis and relied on thematic coding grounded in participant language. Throughout the research process, I kept reflexive notes to document my evolving interpretations and to

remain transparent about how my own beliefs and teaching experiences may shape the study. While my background offers valuable insight into the postdigital context of Kazakhstani education, I recognize that my interpretation of student perspectives is inevitably filtered through my own professional lens.

This positionality is acknowledged not as a limitation, but as an asset that, when managed transparently, enriches the depth and authenticity of the research.

Limitations

The present study has several limitations worth noting. Primarily, the small sample size and qualitative nature of the research restrict the generalizability of findings. Furthermore, my position as an educator within the study context introduces the potential for unintentional biases, despite rigorous efforts towards reflexivity and objectivity, as recommended by Creswell and Poth (2018). Additionally, the brief data collection period might have missed long-term trends or deeper insights into students' adaptation processes.

Implications and Applications

The study offers valuable implications for both policy and pedagogical practice in Kazakhstan's educational sector. School leaders and educators should consider developing structured approaches to integrate digital tools meaningfully into curricula while mitigating the risk of cognitive overload. Specific training and workshops to bolster students' digital literacy and self-regulation skills could prove beneficial, ensuring students effectively manage their digital interactions.

The findings of this study have several important implications for educational practice and policy development in Kazakhstan, particularly in digitally advanced private school contexts. While students reported valuing the accessibility and flexibility provided by digital tools, they also expressed concerns about distraction, digital fatigue, and lack of support in managing their learning across platforms. These insights point to a need for

more intentional integration of digital literacy and self-regulation strategies within the school curriculum.

First, educators must recognize that access to technology does not equate to effective learning. Teachers should be trained not only to use digital tools but also to facilitate students' critical engagement with them. This includes helping students evaluate sources, manage screen time, and reflect on their digital habits. Schools could develop micro-units on digital well-being, embedded into regular classes (e.g., homeroom, ICT, or English), where students assess their tech use and set personal learning boundaries.

Second, school leaders should rethink how blended learning environments are structured. While the presence of platforms like Google Classroom or Zoom is often seen as progress, schools must also consider whether these tools are being used pedagogically, not just administratively. Leadership teams could promote a "postdigital teaching culture" by offering workshops and peer-sharing sessions where teachers co-design tech-enhanced learning experiences that mix online collaboration with offline depth work (e.g., printed worksheets, group discussions, journaling).

Third, curriculum developers and policy planners should incorporate postdigital literacy into national frameworks. Kazakhstan's "Digital Kazakhstan" initiative has emphasized infrastructure and coding, but less attention has been given to digital learning mindsets. This research suggests that students are already navigating a blended environment but require more guidance to do so effectively and healthily. Policymakers could consult with schools and students to co-develop a postdigital competency model that reflects today's hybrid realities—combining cognitive, emotional, and ethical digital skills.

Finally, there is an opportunity for school counsellors and psychologists to be more involved in managing digital stress. The students' accounts of fatigue and burnout call for targeted interventions, such as digital detox challenges, weekly tech reflections, or

mindfulness exercises during lessons. These don't require large budgets but do require institutional prioritization of student well-being in postdigital contexts.

Overall, the study highlights the importance of moving beyond a tech-first approach and toward a learner-centered digital culture, where tools support agency, balance, and deeper engagement with learning.

Recommendations for Further Research

While this study provides valuable insights into how high school students navigate postdigital learning environments, it also opens several avenues for future investigation. The current research was limited to a small group of students in one private school in Astana, which calls for broader studies that incorporate diverse school types and regions. Future research should include public schools, rural settings, and varying socio-economic groups to better understand how digital engagement and challenges differ across the wider Kazakhstani education system.

Additionally, while this study adopted a qualitative case study approach, further research could benefit from mixed methods designs that combine qualitative depth with quantitative generalizability. For example, large-scale surveys could help measure digital fatigue, academic motivation, or cognitive load across various student populations, while follow-up interviews could explore the reasons behind those patterns. This would enrich the theoretical findings with scalable data that could inform national educational policies.

Longitudinal studies would also be particularly useful. Since digital habits evolve over time and are influenced by rapidly changing technologies, a long-term perspective could help identify trends in how students' relationships with digital tools develop across academic years. Such research could explore how students' postdigital learning identities form, stabilize, or shift under different educational and social pressures.

Another promising direction is to explore the teacher perspective in postdigital environments. While this study focused on learners, future studies could examine how teachers perceive and implement postdigital pedagogy, especially in settings where digital platforms are available but pedagogical innovation is uneven. This might include investigating teacher beliefs, training gaps, and institutional support structures.

Finally, future work should consider the role of AI-driven tools—such as ChatGPT, Grammarly, and educational recommendation engines—in shaping students' learning strategies. As these tools become more sophisticated and embedded into daily academic life, researchers must explore not only how students use them, but also how they affect thinking, creativity, and autonomy.

Overall, further research should continue to interrogate the social, psychological, and pedagogical dimensions of postdigital education, ensuring that technological advancement serves meaningful, equitable learning outcomes.

Conclusion

This study set out to explore how high school learners in a private school in Astana, Kazakhstan, experience and make sense of learning in a postdigital environment. Drawing on postdigital theory, connected learning, and critical digital pedagogy, the study revealed that students do not merely use digital tools—they actively negotiate their meaning, benefits, and limitations. Through interviews and reflective journals, five research questions were addressed, each shedding light on different aspects of student agency, motivation, engagement, and the blending of digital and traditional learning practices.

The findings confirm that digital tools have become deeply embedded in the educational lives of students. However, this integration is not without tension. Students experience both the empowerment that digital platforms offer and the overwhelm that

comes with constant digital exposure. They value immediacy and access, but also recognize the cognitive strain and emotional fatigue that can follow unregulated screen time. Rather than being passive digital consumers, the students in this study demonstrated adaptability, self-awareness, and deliberate choices about when and how to use various tools—embodying the core features of postdigital learners.

Importantly, the study's findings carry implications for how schools design learning environments in the digital age. It is no longer sufficient to measure digital progress by device availability or platform adoption. A more nuanced understanding is needed—one that considers student well-being, cognitive load, and the role of self-regulation in technology-rich classrooms. As such, the concept of postdigital education must evolve from being a descriptive framework to a practical guide for shaping learning environments that balance digital efficiency with human depth.

These insights are particularly relevant for Kazakhstan, where digital reforms have accelerated in recent years. While the "Digital Kazakhstan" strategy has focused largely on infrastructure and access, this study suggests that meaningful educational reform must also address digital literacy, psychological well-being, and pedagogical design. Without these components, there is a risk that the rapid adoption of technology in private schools may outpace students' capacity to critically manage their own learning. This gap underscores the need for professional development programs that support educators in applying postdigital principles in classroom practice—not merely using tools, but designing learning environments that reflect human-centered digital engagement.

While this study provides valuable insights, its scope is necessarily limited. The sample was drawn from a single private school, and the findings cannot be generalized across all schools in Kazakhstan or Central Asia. However, the results point to broader patterns and questions that merit future investigation, including how students from

different socio-economic or linguistic backgrounds engage with digital learning, and how school culture mediates the use of technology in everyday life.

Ultimately, this study contributes to the broader conversation on educational transformation in the 21st century. It emphasizes that postdigital education is not simply a matter of tools, but of values, habits, and human relationships within a digitally saturated world. Recognizing the complexity of student experiences allows researchers, educators, and policymakers to move toward a more grounded, ethical, and effective vision of digital education—one that respects both technological potential and human vulnerability.

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Author's Declaration

I hereby declare that I have written this thesis independently and that all contributions of other authors and supporters have been referenced.

The thesis has been written in accordance with the requirements for graduation theses of the Institute of Education of the University of Tartu and is in compliance with good academic practices.

Artyom Sergazinov

Tartu, Estonia, 2025

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Appendix A: Interview Guide

Semi-Structured Interview Guide

The following interview guide was developed to explore how high school students at a private school in Astana, Kazakhstan conceptualize and experience postdigital learning. The semi-structured format allowed for flexibility and follow-up questions depending on participant responses. Questions were designed in alignment with the five research questions guiding this study.

Section 1: General Digital Habits and Attitudes

1. Can you describe how you typically use digital tools in your daily life (both inside and outside of school)?
2. How do you feel about using digital devices for learning?
3. Do you think digital tools have changed the way you learn compared to the past?

Section 2: Postdigital Learning Experiences

4. How do you understand the role of technology in your current school experience?
5. What does a typical day of learning look like for you? What tools do you use?
6. Are there times when you switch between digital and non-digital ways of learning? Why?

Section 3: Challenges and Benefits

7. What do you like most about using digital tools for learning?
8. What challenges or difficulties do you face when learning with technology?
9. Have you ever felt overwhelmed or distracted by digital tools while studying?

Section 4: Motivation and Cognitive Load

10. Do you feel more motivated when using digital tools in class? Why or why not?
11. Do you ever find it hard to focus or stay mentally alert when studying online or using apps?

Section 5: Self-Regulation and Adaptation

12. How do you decide when to use a digital tool versus something more traditional, like paper or books?
13. Do you think your learning is more effective when using digital tools? Why or why not?
14. What do you wish your school or teachers did differently with digital learning?

Note: All participants were informed about the voluntary nature of the interview and provided consent prior to participation.

Appendix B: Reflective Journal Prompts

As part of the data collection process, participants were asked to keep a reflective journal for one week. The purpose of the journal was to capture real-time reflections on how students interacted with digital tools in both academic and non-academic settings. Students were asked to write brief entries each day (at least once per day), following the guiding prompts below. The goal was to encourage awareness of their digital habits, emotions, and learning strategies.

Daily Prompts (for 7 days)

1. **What digital tools did you use today (for school or personal use)?**

   Examples: Google Classroom, YouTube, ChatGPT, social media, apps, etc.

2. **How did you feel while using these tools?**

   Were you focused, distracted, relaxed, overwhelmed, bored, etc.?

3. **Did you switch between digital and non-digital tools today?**

   Why did you switch? What made one more effective or comfortable?

4. **How did digital tools affect your ability to concentrate and learn today?**

   Were they helpful or unhelpful? Explain.

5. **Did you feel motivated or demotivated by your digital learning experience today?**

   What influenced your mood or energy levels?

6. **What was the most difficult part of learning today?**

   Was it related to technology, the subject, or something else?

7. **Anything else you noticed about your learning experience today?**

   This could include habits, distractions, successes, or frustrations.

Note: Students were encouraged to write openly and honestly. All journal entries were confidential and used solely for research purposes, with consent provided in advance.

Appendix C: Participant Information and Consent Table

he following document was shared with all potential participants and their legal guardians prior to participation. It outlines the purpose of the study, the voluntary nature of involvement, data protection practices, and contact details. Participation was only permitted once both student and parent/guardian signed the consent section below.

Participant Information Sheet

Title of the Study:

Re-discovering the Postdigital: The Case of High School Learners at a Private School in Astana, Kazakhstan

Researcher:

Artyom Sergazinov (Master's student, Educational Technology, University of Tartu)

Supervisor:

Professor Emanuele Bardone

Purpose of the Study:

This study aims to explore how high school students experience learning in a postdigital environment, where digital tools are integrated into daily academic and personal life. The goal is to understand both the benefits and the challenges of this environment from a student perspective.

What Participation Involves:

You will be asked to:

- Participate in a one-on-one semi-structured interview (30–45 minutes)
- Keep a daily reflective journal for one week

Voluntary Participation:

Your participation is completely voluntary. You may withdraw at any time without explanation or penalty. Declining to participate will have no effect on your academic standing or relationship with the school.

Confidentiality:

All responses will be kept confidential and used only for research purposes. Pseudonyms will be used in all transcripts and publications. Recordings and journal entries will be securely stored and deleted after the research is completed.

Potential Risks and Benefits:

There are no known risks associated with this study. It may help students reflect on their digital habits and contribute to improving learning environments in schools.

Contact Information:

If you have any questions about this study, you may contact:

Email: [Your email here]

Phone: [Optional]

Consent Form

Please read and sign below if you agree to participate in this study.

- I have read the information above and understand the purpose and procedures of the study.
- I understand that participation is voluntary and that I may withdraw at any time.
- I agree to participate in the interview and keep a reflective journal for one week.
- I understand that my identity will be kept confidential.

Participant Name (Student): _____

Signature: _____

Date: _____

Parent/Guardian Name: _____

Signature (for participants under 18): _____

Date: _____