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Digital Transformation and Educational Resistance: Case Studies of Palestine and Afghanistan

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Abstract

The digitalisation of education raises urgent questions of equity, transparency and academic integrity, particularly in contexts of conflict and crisis. Drawing on a comparative qualitative analysis of two cases: Palestine and Afghanistan, this article shows how universities, lecturers and students adapt digital tools to secure continuity of teaching and the circulation of knowledge, circumventing physical closures, territorial fragmentation, and barriers related to equity and gender. Technology and digitalisation thus emerge both as a vital space of educational resistance and as a terrain dense with dilemmas and challenges. This study offers an ethically grounded and practice-oriented account of digital resistance methods and related solutions, conceptualising them as infrastructures that safeguard the right to education, equity and academic integrity.

Keywords: Digital Ethics, Educational Resistance, Academic Sovereignty, Palestine, Afghanistan

1. *Introduction*

Over the past two decades, higher education has undergone a profound digital transformation. In parallel, the underlying value framework has also matured: the statement of core values within the European Higher Education Area (EHEA) is relatively recent, having been formalised in the *Paris Communiqué* (2018)[1] and reaffirmed in the Rome Communiqué (2020a; 2020b)[2]. These values include academic freedom and integrity, institutional autonomy, the participation of students and staff in governance, and public responsibility for higher education.

[1] European Higher Education Area, *Bologna Process, Paris Communiqué*, Paris, 2018. https://ehea.info/page-ministerial-declarations-and-communiques. [last accessed 15 October 2025].
[2] European Higher Education Area, *Bologna Process, Rome Ministerial Communiqué*, 2020. https://ehea.info/page-ministerial-declarations-and-communiques [last accessed 15 October 2025].

Moreover, the integration of educational technologies (EdTech) has reshaped university life and learning processes, with the aim of translating next-generation promises into practice and enhancing adaptability, focusing on greater efficiency, precision education, personalisation, advanced analytics and a progressive reduction of inequalities[3]. This trajectory accelerated sharply during the COVID-19 pandemic, driving pedagogical innovation and, at least potentially, widening access to knowledge.

Although digitalisation is often presented as a driver of modernisation, efficiency and democratisation, its application in contexts marked by protracted conflict and fragile infrastructure exposes complex ethical issues. A World Bank report on the impact of COVID-19 on education, by way of illustration, concludes that the mere availability of technologies is necessary but not sufficient for effective remote learning; education remains a highly interactive endeavour and the role of teachers is more crucial than ever. The report also notes that the crisis has amplified inequalities while creating an opportunity to rethink the traditional school-centred model of learning[4].

In this context, although views differ on the advantages and disadvantages of technology use, in some settings it is the only practicable means of ensuring continuity of study at multiple levels. In the cases of Palestine and Afghanistan, the adoption of digital technologies is not a simple technological transition; it takes shape as a profoundly political and social process. It reshapes the right to education, the transparency of academic processes, the integrity of assessment and data protection, in scenarios where universities and schools resort to distance learning not as a strategic choice but out of necessity: to survive campus closures, territorial fragmentation, censorship and pervasive insecurity.

This article also focuses on two national contexts with markedly youthful demographic structures, where access to education is both a primary need and a critical challenge. According to the latest data from Afghanistan's National Statistics and Information Authority, published in 2021, over 60% of the population is under 25 years of age and, within this cohort, 50% are female[5]. Palestine, in turn, presents an even lower median age at 20.34 years, with 40% of the population under 14[6]. In light of these figures, the digitalisation of education systems emerges as a strategic factor for many students facing complex challenges. Within this frame, this article compares two countries: Afghanistan, marked by regime change, and Palestine, characterised by persistent territorial fragmentation and instability. The challenges surrounding access to and implementation of educational digitalisation are examined in detail in the following sections.

It is precisely in these settings that forms of "digital resistance" emerge: a set of practices, platforms and informal networks that enable lecturers and students to maintain continuity of learning and the circulation of knowledge despite stringent material and regulatory constraints. The notion of resistance is not used here in a merely rhetorical or negative sense. It describes the capacity of academic actors to repurpose digital tools, such as learning management systems, open access repositories and community networks, to rebuild reliable learning spaces where institutional ones are inaccessible or

[3] Facer, K., Selwyn, N., *Digital technology and the futures of education – towards 'non-stupid' optimism*, UNESCO, 2021, p. 11.
[4] Rodriguez, B., Rebeca, M., Romani, C., et al., *Remote Learning During the Global School Lockdown : Multi-Country Lessons*, Vol. 1, Washington, D.C., World Bank Group, 2022. http://documents.worldbank.org/curated/en/668741627975171644. [last accessed 15 October 2025].
[5] National Statistics and Information Authority (NSIA), *Afghanistan Statistical Yearbook 2020*, no. 42, NSIA 2021, p. 8.
[6] World Population Review, *Palestine*, 2025. https://worldpopulationreview.com/countries/palestine. [last accessed 15 October 2025].

compromised. These practices are decentralised and aim to guarantee low-threshold access, guided by a core principle: *do no harm*[7]. The imperative is twofold: on the one hand, to protect students, lecturers and staff, safeguard sensitive data and avoid harmful tracking; on the other, to ensure a minimum quality of service so that study paths and academic careers are not interrupted. The constant tension that defines this resilient approach lies in balancing the urgency of widening access with the responsibility not to create new vulnerabilities.

A further dimension of EdTech in this account is that it cannot be treated as a neutral infrastructure; it is a field of power. Platforms, standardised metrics and imposed assessment models often act as vehicles of epistemic hierarchies, reproducing technological and intellectual dependencies on the Global North and producing forms of *data colonialism*, that is, the systematic extraction and control of user data for profit or surveillance. Decolonising educational technology therefore does not mean rejecting it, but redirecting its purposes, governance and practices. The project places local community needs, data sovereignty and algorithmic transparency at the centre[8]. In this perspective, digital resistance takes on its deeper meaning: it emerges when students, lecturers and institutions operating under conditions of closure, censorship or personal risk manage to assemble tools and networks creatively in order to defend the right to study, academic integrity and intellectual freedom. Resistance is thus not a refusal of technology; rather, it is the critical reappropriation of the digital for emancipation, academic survival and the overcoming of challenges, especially in contexts of crisis and conflict[9].

2. *Theoretical and ethical framework in the digital sphere*

The analysis of educational practices in crisis contexts is guided by a tripartite ethical framework that problematises the dominant narrative of digitalisation as an intrinsically enabling force. It challenges the rhetoric of digitalisation as a neutral solution, interrogating distributive effects, power relations and surveillance risks. These perspectives allow digital resistance to be read as a situated reappropriation and to be assessed against explicit criteria: access and digital literacy, data security and protection, freedom from censorship, and the forms of educational poverty produced or amplified by digitalisation.

2.1 *Ethical pillars: equity, transparency and integrity under conditions of crisis*

The promise of equity through expanded digital access collides with the harsh realities of conflict-affected settings. In such scenarios, digitalisation risks multiplying pre-existing inequalities. Disparities are evident not only in connectivity and device availability, but also in digital literacy and, crucially, in the personal safety of students and lecturers. In crisis contexts, educational quality is evaluated in terms of capability expansion, understood as the set of substantive freedoms that enable a student to convert resources into valued "functionings", such as learning safely or obtaining academic recognition[10]. For

[7] Marelli, M., (eds), *Handbook, on Data Protection in Humanitarian Action*, Cambridge University Press & Assessment, 2024, p. 24.
[8] Koole, M., Smith, M., Traxler, J., et al., *Decolonising Educational Technology, "Education Sciences"*, Vol. 14, no. 10:1070, 2024. pp. 1-9. https://doi.org/10.3390/educsci14101070.
[9] Deacon, B., Laufer, M., Mende, M. A., et al., *Resisting digital change at the university: an exploration into triggers and organisational countermeasures*, "European Journal of Higher Education", 2025, pp.1-24. https://doi.org/10.1080/21568235.2025.2512735.
[10] Nussbaum, M. C., *Creating Capabilities: The Human Development Approach*. Cambridge, MA: The Belknap Press of Harvard University Press, 2011, pp. 17-20, 33-34.

this reason, the capabilities approach remains an essential theoretical tool for dismantling superficial rhetoric about digital access and for revealing the substantive meaning of equity in fragile settings.

The ethical question therefore shifts from who access to the conditions of access: hidden costs, security risks, and the subsequent formal recognition of learning and qualifications[11]. This point is especially salient when examining a country in conflict, such as Palestine, or a country that has undergone regime change towards religious authoritarianism, such as Afghanistan, where access to higher education is extremely limited for women.

Operational frameworks for *education in emergencies*[12] and for data responsibility in humanitarian action (ICRC 2024; OCHA 2025)[13] suggest concrete principles: *do no harm*, data minimisation, differentiated safety for at-risk groups, redundancies and continuity plans. This supports interpreting EdTech not as an end in itself, but as infrastructure for the right to study, a system that must function despite low bandwidth, forced mobility, blackouts and tracking risks. Dependence on digital platforms introduces significant opacity through *algorithmic mediation*[14], visible in *proctoring systems*[15], automated content curation and the analysis of behavioural logs. This technical opacity combines dangerously with the already limited institutional accountability typical of crisis settings, undermining student trust, the validity of examinations and the accuracy of academic records. The transparency required is therefore not merely procedural; it must evolve into epistemic transparency, including the explainability of automated decision-making and full disclosure of risks associated with third-party providers.

The transition to digital poses complex challenges for academic integrity. On the one hand, it is necessary to guarantee the authenticity of assessment, equitable access to resources and the prevention of abuses, from plagiarism to impersonation. On the other hand, indiscriminate control strategies can prove counterproductive and, in some contexts, actively harmful. In environments marked by pervasive surveillance and repressive risk, invasive verification measures endanger the physical and digital safety of the academic community. Preserving integrity, therefore, requires a proportionate balance between

[11] As the Organisation for Economic Co-operation and Development (OECD) Notes, «"safe digital technologies improve the life of those who have the skills to use them" From one perspective, people can seize digital opportunities provided they have the skills often termed "digital literacy". Conversely, "digital technologies entail a major inequality risk for society, as they introduce a digital divide between those who have the skills to use them and those who do not"», OECD, *How's Life in the Digital Age? Opportunities and Risks of the Digital Transformation for People's Well-Being*, OECD Publishing, Paris, 2019, pp. 12-13.

[12] Inter-agency Network for Education in Emergencies (INEE), *Minimum Standards for Education: Preparedness, Response, Recovery*, INEE, 2024, https://inee.org/minimum-standards. [last access22 October 2025].

[13] United Nations Office for the Coordination of Humanitarian Affairs (OCHA), *OCHA Data Responsibility Guidelines*, OCHA Centre For Humanitaria Data, 2025. International Committee of the Red Cross (ICRC), *Professional Standards for Protection Work: By Humanitarian and Human Rights Actors During Armed Conflict and Other Violence*, 2024, see chapture 7. See also Marelli, M., (eds), *Handbook on Data Protection in Humanitaria Action*, Cambridge University Press, 2021.

[14] «L'opacità algoritmica, in particolare, costituisce una sfida significativa per la trasparenza, soprattutto perché: (i) si ricorre a big data, che per volume, varietà e velocità rendono difficoltosa la tracciabilità e l'intelligibilità delle decisioni; (ii) la capacità di alcuni algoritmi – in particolare machine learning e deep learning – di auto apprendere e di "decidere" in autonomia rendono tali processi intrinsecamente imprevedibili». Istituto di Ricerca sulla Pubblica Amministrazione (IPRA), *Orizzonti: gli Editoriali dell'OS, l'attività amministrativa algoritmica per principi: limiti e prospettive*, no.9, January 2025, IRPA. https://www.irpa.eu/orizzonti-gli-editoriali-dellosd-numero-9-. [last accessed 15 October 2025].

[15] «An online proctoring system is an advanced AI integrated system developed to ensure a secure test environment when a test-taker writes an online test remotely. Anti-cheating proctoring tools, proctoring integration with any LMS, and the ability to detect cheating instances with optimum reliability form the crux of an ideal proctoring system. Proctoring system is an entire process concerning online proctoring. It is an advanced setup, combining AI-powered services and tools that secure the test environment when a test-taker writes an online test remotely. An online proctoring system serves the needs of academia and students as it streamlines and automates the process of conducting secure examinations, from authenticating, invigilating and measuring». Proctoring System: https://mettl.com/glossary/p/proctoring-system/. [last access15 October 2025].

certification needs and the primacy of personal protection, favouring *privacy-by-design*[16] protocols, data minimisation and low-impact verification tools.

In the two case studies examined here, Palestine and Afghanistan, this balance is further complicated by access blockages, uneven investment, limited standardisation of digital infrastructure, economic poverty and low levels of digital literacy. These factors make it difficult to align with the service levels typical of many European universities and necessitate gradual, proportionate and safety-conscious solutions.

2.2 *Theoretical framework: technology, power and resistance*

In crisis contexts, the "imposition of the digital" raises ethical and practical issues, yet technological resistances are not a rejection of education; they are its safeguard. In Palestine and Afghanistan, opposition to, evasion of, or critical reappropriation of imposed technologies evolves from a gesture of protest into an essential strategy for continuity of teaching.

To frame the phenomenon, a holistic perspective is needed that connects technology, power and structural inequality. Digitalisation interacts with two key dynamics: *data colonialism*, that is, *extractivism* that reproduces dependency and exploitation through control of infrastructures and platforms[17]; and the power–knowledge nexus, whereby critical mastery of tools determines access to services and educational programmes[18], and in parallel, the *platformisation of education* entrenches dependence on private actors, relocating curricular choices, assessment processes and educational governance onto external platforms[19]. From this follows the notion of digital educational sovereignty: the capacity of an academic community to determine its own contents, methods and spaces of knowledge. Within the SCOT approach (Social Construction of Technology)[20] and *domestication* theory, resistive practices become collective efforts to reconfigure potentially oppressive tools so they fit local needs. This reconfiguration entails processes of data production, collection and circulation that raise questions of responsibility, transparency and power. *Data justice* offers criteria for assessing legitimacy: who collects which data, for what purposes, and with what forms of return to communities. In this sense, resistance ceases to be mere opposition and becomes enabling[21]. This digital resilience takes shape through a myriad of tactics. The use of encrypted platforms and informal channels, for example, exemplifies what Michel de Certeau would call a "tactic" of the weak against the "strategies" of a dominant technocratic apparatus, a resourceful way of operating within the adversary's field[22]. At the same time, the insistence

[16] PrivacyEngine, *Understanding Privacy by Design Principles*, 7 November 2023. https://www.privacyengine.io/blog/understanding-privacy-by-design-principles. [last accessed 15 October 2025].
[17] See also chapter Six: Couldry, N., Mejias U. A., *The Costs of Connection: How Data Is Colonizing Human Life and Appropriating It for Capitalism*, Stanford: Stanford University Press, 2019.
[18] Foucault, M., *Power/Knowledge: Selected Interviews and Other Writings*, 1972–1977, (eds) Colin Gordon, New York: Pantheon, 1980, spec. "Two Lectures". pp. 142-143.
[19] Williamson, B., Learning in the 'platform society': *Disassembling an educational data assemblage*, "Research in Education" 98, no. 1, 2017, pp. 59-82. https://doi.org/10.1177/0034523717723389. Decuypere, M., Grimaldi, E., Landri, P., *Introduction: Education and the Platform Society, "European Educational Research Journal"*, Vol. 62, no. 1, 2021. pp.1-16. https://doi.org/10.1080/17508487.2020.1866050.
[20] Bijker, W. E., Hughes, T. P., Pinch, T. J., (eds), *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*, University of Michigan Press, 2012, pp. 9-25, 24-28.
[21] Dencik, L., Hintz, A., Redden, J., et al., *Data Justice: Exploring Fairness in Datafication*, "Information, Communication & Society", Vol. 22, no. 7, 2019, pp. 873–881. https://doi.org/10.1080/1369118X.2019.1606268. Heeks, R., e Renken, J., *Data Justice for Development: what is means?* "Information Development ", Vol. 34, no. 1, 2018, pp. 90-102. https://doi.org/10.1177/0266666916678282.
[22] De Certeau, M., *The Practice of Everyday Life* (Steven Rendall, Trans.), Berkeley: University of California Press, 1984, pp. 29-42.

of teachers on maintaining elements of direct human relationship, despite pressure towards total digitalisation, can be read through Joan Tronto's ethics of care as resistance to a logic of pure efficiency at the expense of educational wellbeing[23]. Where official digital infrastructure may serve as a vehicle of surveillance, a phenomenon Shoshana Zuboff situates within "surveillance capitalism", the decision to avoid such platforms becomes an act of data self-defence and a precondition for free teaching[24]. The practices documented alongside this research on Palestine and Afghanistan, from the adoption of alternative platforms to data protection, thus find clear political justification: they are not mere survival tactics, but constitutive acts of sovereignty. Ultimately, this everyday resistance is not a symptom of backwardness; it is an expression of civic resilience that, through the digital, defends the right to study where it is most threatened, and frames low-tech, low-surveillance choices as ethical options rather than residual ones.

3. *Palestinian case study: learning despite fragmentation*

In the Palestinian context, higher education is conceived as a crucial sphere for collective agency and for the reconfiguration of power relations. In response to structures of domination that deny self-determination, knowledge acquires an intrinsically political value and becomes a form of epistemic resistance. This theoretical framework positions the university not merely as a teaching institution but as a site of counter-hegemony, where the construction of an autonomous body of knowledge and the solidarity networks that arise from it become fundamental to imagining and laying the groundwork for a future sovereign and flourishing society. In this perspective, access to knowledge is an act of self-determination and the primary instrument of both cultural and political liberation.

From 1967 onwards, many Palestinians seeking higher education turned to universities in neighbouring Arab countries such as Jordan, Egypt, Lebanon and Syria. This trajectory changed radically as Israeli authorities progressively tightened cross-border restrictions in the West Bank and the Gaza Strip. The system of restricted mobility increasingly constrained students' ability to attend institutions abroad, making such pathways costly and risky. In response, an endogenous process emerged to consolidate and transform pre-existing institutes in the Palestinian territories into universities and to build an internal quality-assurance system. In 1977, the Council for Higher Education was established as an autonomous accreditation body that ensured institutional continuity and, following the Oslo Accords (1994), came under the supervision of the Palestinian Ministry of Higher Education[25]. The Palestinian education system has historically faced multidimensional challenges, which have intensified significantly in recent decades. Numerous studies indicate that, from the Second Intifada (September 2000) onwards, the system was severely compromised by prolonged closures and mobility restrictions. The situation worsened sharply with Israel's construction, begun in June 2002, of the separation barrier, termed by Palestinians the 'wall of segregation'. Crossing many towns and villages, the barrier disrupts territorial

[23] Tronto, J., *Moral Boundaries: A Political Argument for an Ethic of Care*. New York: Routledge, 1993, pp. 101-108, 131-138.
[24] Zuboff, Sh., *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power*, New York: PublicAffairs, 2019, pp. 1-20, 195-230.
[25] Al-Botmeh, S., *Palestinian higher education: resistance to settler colonialism in the face of erasure*, "Globalisation, Societies and Education", 2025, pp. 1-9.

continuity and obstructs daily movement, effectively separating students and lecturers from their schools and universities[26].

In this context, the multiplication of military checkpoints and the raising of the wall produced systemic effects: delays and forced absences, disruption of academic calendars, and an overall reduction in access to educational services. The combination of physical barriers and control mechanisms has turned access to education into an uncertain and unequal journey, with deep consequences for the quality, equity and continuity of learning processes, as well as for the psychosocial wellbeing of an entire generation[27]. Many of these knock-on effects remain unresolved. A further factor is that, although the digitalisation of education expanded dramatically during COVID-19, its effects have been far from uniform. Distance learning and the use of technology were already employed by Palestinian students before the pandemic, often because physical access to institutions was obstructed. In 2020, however, more than seven thousand Palestinians living south of Hebron (West Bank) lacked communication lines and a fixed network, and most families did not own a computer, which exacerbated inequalities tied to online learning. Sixteen villages in the area fall within Area C, where the Palestinian telecommunications company is not authorised to extend the telephone network; this zone is under full Israeli administrative and security control pursuant to the 1993 Oslo Accords between the Palestine Liberation Organization (PLO) and Israel[28].

3.1 *Digitalisation and the education crisis in the context of conflict*

In parallel, several higher-education digitalisation programmes were developed. In the three years preceding the October 7 conflict, the Palestinian ecosystem benefited from structural initiatives launched before 2023, including Erasmus+ TEFL-ePal (2019), which reformed English teaching through Learning Management Systems (LMS), open educational resources and teacher training (2019–2022); a school digitalisation programme in the West Bank funded by international cooperation (2019), which introduced pedagogical uses of Information and Communication Technologies (ICT)[29] across hundreds of schools; UNRWA's digital learning strategy (2020)[30] for Palestinian refugees, created during the pandemic to ensure continuity through online platforms and tablet provision in West Bank and Gaza schools; and the E-Pal project (NORHED II) (2021)[31], focused on systemic strengthening of *technology-enhanced learning* in universities, including institutional capacity, governance and standards for *blended* courses. These initiatives, launched respectively in 2019, 2020 and 2021, laid the groundwork for blended practices, digital infrastructures and staff competences that, though developed in "ordinary"

[26] UNICEF, *State of Palestine: Country Report on Out-Of-School Children*, Middle East and North Africa Out-Of-School Children Initiative, July 2018. https://www.unicef.org/mena/media/2566/file/SoP-OOSCIReport-July2018.pdf.pdf. [last accessed 15 October 2025].
[27] Cf., Ramahi, H., *Education in Palestine: Current Challenges and Emancipatory Alternatives*, Rosa Luxemburg Stiftung Regional Office: Ramallah, Palestine, 2015, pp. 1-51.
[28] Matt Smith, M., Scott, H., *Distance Education under Oppression: The Case of Palestinian Higher Education*, "Education Science", Vol., 13, no. 7:729, 2023, pp. 1-13. https://doi.org/10.3390/educsci13070729.
[29] Scott, H., Smith, M., *Innovation from necessity: digital technologies, teacher development and reciprocity with organisational innovation Icon*, "Open Learning: The Journal of Open, Distance And E-Learning", Vol. 39, no. 2, 2024. pp. 170-187. https://doi.org/10.1080/02680513.2024.2307627.
[30] United Nations Relief and Works Agency for Palestine Refugees in the Near East, the UN Agency. See also the new programme launched in 2022: *UNRWA Digital Transformation Strategy* (2022 – 2026). https://www.unrwa.org/resources/strategy-policy/unrwa-digital-transformation-strategy-2022-%E2%80%93-2026. [last accessed 15 October 2025].
[31] «E-Pal is a six-year research and development project aimed at strengthening technology-enhanced learning in the Palestinian higher education sector, where staff at the LINK Centre for Learning, Innovation and Academic Development and Oslo Metropolitan University collaborate with Palestinian colleagues at Palestine Polytechnic University in the West Bank and University College of Applied Sciences in Gaza to develop new technological, pedagogical and organizational approaches to technology-enhanced teaching and learning. The project also aims at strengthening ICT and education as a research field in Palestine». https://www.uio.no/link/english/e-pal/. [last access 15 October 2025].

times or during the pandemic, proved essential to educational resilience in subsequent periods. Official data indicate that in 2017, roughly 80% of the 87,000 students enrolled in higher-education institutions in the Gaza Strip attended universities, while the remaining 20% were in colleges. On the eve of the 2023 conflict, the Palestinian higher-education system comprised 21 universities and 32 colleges, with 34 campuses in the West Bank and 19 in Gaza. Data for the years immediately preceding the war show a steadily growing student population and a marked majority of female enrolments, signalling high levels of schooling even compared with many low- and middle-income countries[32].

Subsequently, Palestinian universities faced military closures and systematic raids, with prolonged suspensions that in some cases lasted years, pushing higher education underground, with classes held in homes and community centres. Campuses continue to experience incursions, undercover operations and arrests of student representatives, alongside damage to and seizure of teaching and laboratory equipment. Such actions have endangered the lives of students, lecturers, researchers and university staff, especially during military operations, periods of heightened tension and war[33]. In this context, and also as a form of resistance, universities developed practices of educational resilience ranging from clandestine teaching to digital innovation. During past campus closures, teaching continued "discreetly" in private houses and community centres, with networks of lecturers and students organising alternative lessons and self-managed materials, an experience documented by Birzeit's *Right to Education Campaign* and by the literature on "underground" schools and universities[34].

Post-2023, given the destruction of facilities and laboratories, provision has shifted to lightweight environments: recorded lectures, discussion groups on messaging applications such as WhatsApp, low-bandwidth learning units and community spaces with shared connectivity. In parallel, plans have enabled students in Gaza to enrol in online courses delivered from the West Bank, and international initiatives such as UNESCO's *Gaza Virtual Campus and Temporary Learning Spaces* have supported tens of thousands of university students. The *Virtual Campus* aims to allow each university to recreate a full academic environment within a shared digital platform, enabling Gaza institutions to continue operating and students to pursue courses, interactive learning and assessment even when physical campuses remain closed[35]. Because distance learning ensures continuity but cannot replace campus life, the *Virtual Campus* is coupled with UNESCO's *Temporary Learning Spaces*, which provide digital resources, stable connectivity and psychosocial support[36]. Despite these measures, pressure on campuses remains high, with repeated raids and seizures affecting institutions such as Birzeit, arrests of student representatives and damage to equipment[37]. Beyond disrupting teaching continuity,

[32] Ibid. Cf., Palestinian Central Bureau of Statistics (PCBS), *Distribution of Students Enrolled in Palestinian Higher Education Institutions by Specialization and Sex*, 2021/2022. Ministry of Higher Education & Scientific Research, 2023. https://www.pcbs.gov.ps/Portals/_Rainbow/Documents/Higher_Education_2021_02E%20.html. [last accessed 15 October 2025].
Palestinian Central Bureau of Statistics (PCBS), *Issues a Press Release on the Impact of the Israeli Occupation Aggression on the Right to Education in Palestine during 07/10/2023-11/11/2023*, 2023. https://www.palestine-studies.org/en/node/1654633. [last accessed 15 October 2025].
[33] Rabaia, I. S. I, Lourdes Habash, *The Hidden War on Higher Education: Unmasking the 'Educide' in Gaza*, https://pomeps.org/the-hidden-war-on-higher-education-unmasking-the-educide-in-gaza. [last access 15 October 2025].
[34] Brizeit University, *The Right to Education Campaign*, https://www.birzeit.edu/en/right2edu?utm. [last accessed 15 October 2025].
[35] «Through UNESCO's Gaza Virtual Campus, 20,000 higher education students will be able to resume their education in the first phase, with plans to expand its reach to all 88,000 university students in Gaza», UNESCO, *In Gaza, UNESCO supports students amid a devastated education landscape*. https://www.unesco.org/en/articles/gaza-unesco-supports-students-amid-devastated-education-landscape?utm. [last accessed 15 October 2025].
[36] Ibid.
[37] Brizeit University, *The Right to Education Campaign*..., cit.

these episodes confirm universities' role as spaces of civil resistance, consistent with Gene Sharp's *198 Methods of Nonviolent Action*[38] and with the idea of educational institutions as infrastructures of collective agency in contexts of domination and occupation, which also extends to digital resistance for the continuity of the struggle.

Since October 2023, higher education in the Gaza Strip has faced unprecedented challenges threatening its very survival. Shortages of essential goods, widespread insecurity, the destruction of infrastructure and prolonged interruptions to electricity and connectivity make any form of distance learning extremely difficult. Even so, students and lecturers continue to treat study as an anchor, both material and symbolic, and student motivation becomes a decisive resource for maintaining continuity[39]. The Palestinian experience shows that, despite conflict and shortages of devices and connectivity, digital transformation has become a mode of resilience and educational "resistance". This digital bridge has enabled classes, inter-university collaboration and international openings, overcoming closures and blockages. At the same time, the transition has exposed profound problems: the digital divide in access to devices and the internet, high costs, privacy concerns and the quality of online teaching.

4. *Afghanistan case study: digitalisation and invisible education*

The digitalisation of education is promoted across diverse geopolitical contexts as a strategy to secure equity and access to knowledge. This takes on particular contours in settings of protracted conflict or authoritarian rule, where it becomes a tool of educational resilience. In Palestine, digitalisation has been systematically adopted for decades in response to structural restrictions on higher education, functioning as an adaptation and resistance to occupation. In Afghanistan, by contrast, the digital turn reached a critical juncture after the Taliban takeover in August 2021 and the subsequent ban on women's higher education, which led to the *de facto* dismantling of the traditional university system. In response to this institutional rupture, a dense network of underground digital education has emerged. Through this informal infrastructure, lecturers and civil-society organisations run clandestine online courses for female students, despite precarious internet connectivity and limited device availability. Within this shadow system, the Afghan academic diaspora plays a pivotal role by providing distance teaching and creating digital archives, not only to maintain continuity of learning but also to preserve the secular curricular heritage and the cultural production of the pre-Taliban period for transmission to future generations.

At the same time, although digitalisation is often presented as a vehicle for equity and inclusion, in many contexts it fails to reduce, and sometimes amplifies, gender gaps. Inequalities concern not only access to devices and connectivity but also digital skills, socio-cultural norms that limit women's and girls' autonomous use of technology, lower household resources, online and offline safety, family control over access, and quality of use, which results in lower participation in advanced training and in digital entrepreneurship. In low-income or rural areas, where connectivity is expensive and public access points

[38] Sharp, G., 198 *Methods of Nonviolent Action*. https://commonslibrary.org/wp-content/uploads/GeneSharp_198Tactics.pdf. [last accessed 15 October 2025].
[39] «The role of the university in promoting personal, economic, local and national survival and development in Palestine has long been recognised. It is directly linked to attempts to "strengthen the survival capacities of Palestinians" and to develop their "means of personal survival and national salvation"». Hallaj, M., *The Mission of Palestinian Higher Education*, "Journal of Palestine Studies", Vol. 9, no. 4, 1980, pp. 75-95, online version: 4 February 2021. https://doi.org/10.2307/2536125.

are scarce or unsafe, the promise of digital inclusion can turn into additional barriers to education, work and services, with cumulative effects on economic autonomy and civic participation. Policies limited to distributing devices or providing basic literacy are therefore insufficient. Integrated interventions are needed that combine affordability, continuous gender-sensitive training, safe learning and working environments, appropriate governance of data and content, and targeted actions to counter stereotypes and *bias* across the education and employment system. Only from this perspective can digital transformation become genuinely enabling rather than reproducing pre-existing inequalities[40].

Stepping back, education in Afghanistan has been shaped by decades of armed conflict, political instability and regime change, with direct effects on access, quality and governance. From the monarchy to Soviet influence and more recent governments, each phase set different orientations for structures, curricula and aims. The Soviet occupation (1979–1989) promoted a centralised model, curricula inspired by socialist principles, the use of Russian as a medium of instruction and an expansion of girls' education. These reforms met strong resistance and were partly dismantled after the communist regime collapsed in 1992. Subsequent fragmentation produced uneven school provision, while millions of refugees in Pakistan and Iran established schools and even some universities in camps and host communities. With the rise of the Taliban in the late 1990s, formal education was sharply curtailed. Girls' access was drastically restricted, many schools were closed or converted into madrasas, and key subjects such as history, geography and the natural sciences disappeared from the curriculum, with more than half of school time devoted to religious subjects. Arabic replaced Pashto and Dari in textbooks. In this context, informal and clandestine home-based education developed to preserve a broader curriculum[41].

After 2001, in areas under the Islamic Republic of Afghanistan with international support, a significant reconstruction of the education sector began: schools reopened and new ones were built, teacher-training programmes were launched, and curricula were updated to reintroduce religious education alongside science, mathematics, Dari and Pashto literature, English, history, culture, art and civic education. Sports were promoted for girls and boys. Schooling was compulsory to the ninth grade and, despite large urban–rural disparities and continued attacks on schools, especially girls' schools, girls' access registered progress. Upper-secondary enrolments rose from about 8,000 to around 400,000 between 2001 and 2021, across 39 public and 128 private universities. The Taliban's return in 2021 reversed many of these gains: university staff fled, international funding was frozen, numerous private universities closed, and enrolment is estimated to have fallen by about 50%. Women were progressively banned from secondary school and then from university, excluding more than 1.4 million girls from education, with severe limitations even at upper levels except in narrow fields such as midwifery. Women teachers were restricted largely to girls' primary schools and madrasas expanded, with thousands of new religious institutes in the early years of the new regime. Recent surveys indicate a rise in religious instruction at the expense of secular subjects and a contraction of qualified staff[42].

[40] Mariscal, J., Mayne, G., Aneja, U., et al., *Bridging the Gender Digital Gap, "Economics: The Open Access, Open-Assessment e-Journal"* Vol. 13, no. 9. 2019, pp. 1-12. https://doi.org/10.5018/economics-ejournal.ja.2019-9.

[41] Finocchietti, C., Spitalieri S., Zakeri, Sh., (eds) *Istruzione in Afghanistan: evoluzione e riconoscimento dei titoli in Italia*, 2024. https://www.cimea.it/Upload/Documenti/Istruzione-in-afghanistan_2024.pdf. [last accessed 15 October 2025].

[42] Mohibbi, A., A., Coburn, N., *How Taliban Rule Has Reshaped Higher Education in Afghanistan*, "The Diplomat", 8 August 2024. https://thediplomat.com/2024/08/how-taliban-rule-has-reshaped-higher-education-in-afghanistan/. [last accessed 15 October 2025]. Ahmadi B., Sultan H., *Taking a Terrible Toll: The Taliban's Education Ban*, United State Institute of Peace, 13 April 2023. https://www.usip.org/publications/2023/04/taking-terrible-toll-talibans-education-ban. [last accessed 15 October 2025].

During the pandemic, distance-learning programmes via television, radio and mobile phones were introduced, but their impact was limited by low literacy, high connectivity costs, scarce technological provision and unequal access. Before 2021 only a minority of students could benefit consistently. After 2021, initiatives in the diaspora and neighbouring countries, including online schools for girls, sought to provide remote education and psychosocial support. These experiments, however, are constrained by intermittent connectivity, high data costs, scarce devices and, in some cases, government restrictions on networks and platforms that deliberately interrupt or slow access. In many countries, digitalisation is conceived primarily as a lever for access to tertiary education; in Afghanistan, it is first a basic enabling device to be introduced locally by training people to use digital tools and supporting literacy, especially for women. The gap remains wide: in 2022 adult literacy stood at 37.3% (women 22.6%, men 52.1%), while among 15-24 year-olds it reached 62.66% (females 44.17%, males 83.40%), confirming a significant gender disparity. Despite slight improvements in recent years, Afghanistan remains among the lowest in the world[43].

4.1 *Digitalisation of education in Afghanistan: the dilemma facing female students*

Regarding the digitalisation of the education system in Afghanistan, prolonged politico-military instability and restrictions imposed by the Taliban regime have structurally reduced educational opportunities for women, widening the gender digital divide. Despite 3G coverage above 85% and connected devices among roughly one third of the population, more than 90% of women still lack basic digital skills and effective access to the internet[44]. A further vulnerability has emerged in recent years: partial and total internet shutdowns, deliberate reductions in bandwidth, targeted platform blocks, and extensive content control and filtering[45]. These practices of limitation (throttling) and disconnection (internet shutdowns), implemented for reasons of public order and security, amount to a de facto suspension of the right to information and to digital services, disproportionately affecting women and girls who already face constraints on mobility and schooling. Various projects, therefore, adopt *low-tech*[46] approaches to mitigate these challenges.

Tables 1 and 2 analyse selected digitalisation projects active in the country, highlighting feasibility, trajectories, limits and risks, with particular attention to initiatives focused on basic competences (STEM and English) and on the inclusion of female students.

[43] Zakeri, Sh., *L'evoluzione dell'istruzione in Afghanistan: tra storia, politica e sfide contemporanee*, in Finocchietti, C., Spitalieri S., Zakeri Sh., (eds) Istruzione in Afghanistan: evoluzione e riconoscimento dei titoli in Italia, 2024. pp. 11-17. https://www.cimea.it/Upload/Documenti/Istruzione-in-afghanistan_2024.pdf. [last accessed 15 October 2025].
UNESCO, *Afghanista: Country Profile*, October 2022. https://www.uil.unesco.org/sites/default/files/medias/files/2022/11/gal_country_profiles_afghanistan.pdf. [last sccessed 15 October 2025].
[44] Nazari, Z., Musilek, P., *The Gender Digital Divide and Education in Afghanistan: A Review, "2023 IEEE International Humanitarian Technology Conference* (IHTC)", Santa Marta, Colombia, 2023, pp. 1-7. *http://dx.doi.org/10.1109/ihtc58960.2023.10508864*.
[45] Kozul-Wright, A., *Afghanistan imposes internet blackout: What has the effect been so far?* Aljazeera News Agencies, 30 September 2025. https://www.aljazeera.com/news/2025/9/30/afghanistan-imposes-internet-blackout-what-has-the-effect-been-so-far. [last accessed 15 October 2025].
[46] *Low-tech* in education refers to digital solutions with minimal bandwidth and complexity – e.g., educational radio/TV, SMS/WhatsApp delivery, and offline-first asynchronous content – designed for fragile infrastructures. Such tools lower accesscosts and increase operational resilience, but require strong pedagogical mediation (tutoring, simple assessment) to prevent quality loss and learner attrition. Brazilian Network Information Center – NIC.br (eds), *Education and Digital Technologies: Challenges and Strategies for the Continuity of Learning in Times of Covid-19*, Brazilian Internet Steering Committee – CGI.br, São Paulo, 2021, pp. 43-44.

Table 1 - Project Profile and compact

Project	Delivery type	Subjects/Focus	Target	Period	Channels/Tech	Notes/Impact
LEARN Afghan[47] (Pashtana Durrani)	Digital schools & online classes	Digital literacy; general curriculum; basic STEM	Girls and women	2021 →	WhatsApp, smartphones, offline kits	Teacher training on digital literacy; local *low tech* networks
SOLA – SOLAx[48] (WhatsApp Academy)	Asynchronous WhatsApp academy	English; general subjects; life skills	Primarily girls	2022 →	WhatsApp/ chatbot; audio/text micro lessons	Ultra low bandwidth access; multilingual content (EN/Dari/ Pashto)
Children on the Edge[49] – Online education for girls	Protected online classes	Core curriculum; English	Girls	2022 →	Video platforms; volunteer tutors	800+ beneficiaries; adapted to *low spec devices*
Afghan Scholars in Exile (AUP/ AUAF & network)	Online university level courses	Academic English; social sciences; IT	Female students excluded from university	2021 →	Zoom/LMS; repositories	Mentoring by exiled faculty; informal credits[50]
UNESCO – media based programmes	Radio/TV + digital supplements	Literacy; PSS; foundational skills	Women and girls	2022 →	Community radio; educational TV; online repositories	Nationwide reach; resilience via broadcast
Noor Initiative	Multi channel (TV, radio, online)	STEM (math/ science); English; digital skills	Girls	2023 →	TV/radio; WhatsApp tutoring; chatbot	Scalable content; remote homework support
Afghan Geeks (coding)	Online bootcamps/ courses	Programming; ICT for remote work	Women and girls	2022 →	LMS; GitHub; Zoom	Employability focus; freelancing mentorship
Vision Online University	Free online university	Languages; IT; humanities	Female students	2023 →	Web platform; mobile app	Thousands of enrolments; modular paths
Diffuse platforms (Zoom/ WhatsApp)	Informal lessons & micro courses	English; Kankor prep; basic IT	Girls and boys (mixed)	2021 →	Zoom; WhatsApp; PDFs/audio	Grass roots ecosystem; flexible scheduling

[47] «Finding innovative ways to ensure education for all is essential for overcoming the challenges caused by poverty, lack of social and educational infrastructure, and some cultural issues that hinder the progress of education in Afghanistan». LEARN Afghan, *Building brighter futures for Afghan girls and communities through education, healthcare, and innovation*. https://learnafghan.org/. [last accessed 15 October 2025].
[48] «SOLAx isn't a replacement for SOLA. It's not an equivalent to SOLA, or an equivalent to in-person, in-classroom learning. It's an alternative for girls whose educational lives are on pause and maybe have been that way for years. It's a light of hope and an initial step on a path that leads back to the classroom». School of Leadership Afghanistan (SOLA), https://www.sola-afghanistan.org/introducing-solax. [last accessed 15 October 2025].
[48] Children on the Edge has been supporting her organisation since 2022. Partnership with "Afghanistan Education Action" to help strengthen the organisation as it grows. https://childrenontheedge.org/how-we-help/education/online-education-for-girls-from-afghanistan. [last accessed 15 October 2025]. The AEA include also two other programms: Herat Online School launched in 2021 after the Taliban takeover, and Persian Online School - a dedicated path for committed students ready for a formal, internationally recognised education through our AEA International School. https://www.afghanistaneducationaction.org/. [last accessed 15 October 2025].
[50] The group is working in the direction by standardizing the curriculum and collaborating with outside educational institutions for partnerships and accreditation.

Table 2 – Risk and Challenges

Project	Risks & Challenges
LEARN Afghan (Pashtana Durrani)	Frequent connectivity outages; scarcity of devices; safety and surveillance risks for learners and teachers; donor funding volatility.
SOLA / SOLAx (WhatsApp Academy)	Dependency on a single platform; risk of content exposure; limited assessment and external recognition of learning.
Children on the Edge	Privacy and safeguarding concerns; intermittent bandwidth; sustainability of a volunteer driven model.
Scholars in Exile (AUP/AUAF & network)	Unclear credential recognition; variable quality assurance; digital security risks for participants and faculty.
UNESCO – media based programmes	Editorial constraints; difficulties in measuring learning outcomes at scale; continuity of funding.
Noor Initiative	Quality assurance at scale; monitoring/surveillance risks; infrastructure and power outages.
Afghan Geeks (coding)	Limited absorption by the local job market; sanctions and payment hurdles for remote work; sustained internet requirements.
Vision Online University	Lack of formal accreditation; platform and data security; continuity of service and maintenance.
Diffuse ecosystem (Zoom/WhatsApp)	High variance in instructional quality; safeguarding challenges; vulnerability to shutdowns and throttling.

Adopting digital transformation in Afghanistan is feasible only within a hybrid, low-tech architecture (broadcast radio and TV, low-bandwidth messaging, asynchronous content) that can mitigate intermittent networks, scarce devices and security risks for learners and teachers. In 2022, only 6% of women in Afghanistan had access to the internet, compared with 25% of men[51].

However, digital exclusion is not merely an infrastructural issue. It stems from the interaction of socio-economic factors (poverty, low literacy, the cost of connectivity), cultural norms (patriarchal restrictions on mobility and information consumption) and institutional constraints (inadequate regulatory frameworks, bans on women's education and employment). Under such conditions, digitalisation tends to reproduce and even accentuate pre-existing inequalities, especially gender-related ones, when effective user competences, substantive freedoms, safe environments and service continuity are lacking. The mapped cases show the most robust results where provision combines basic digital literacy and secular content (English, STEM, ICT) with targeted tutoring, safeguarding protocols and minimal recognition of learning (micro-credentials, employment references). It follows that programmes to strengthen women's digital skills, accompanied by measures to protect access, data security and

[51] CALLUP, *Digital Freedom Out of Reach for Most Afghan Women*, 7 march 2023. https://news.gallup.com/opinion/gallup/471209/digital-freedom-reach-afghan-women.aspx?deliveryName=DM192133. [last accessed 15 October 2025].

freedom of expression, are a necessary condition for restoring minimal educational rights, enabling remote learning and work, and supporting a genuinely inclusive transition to a digital society. Despite low connectivity, several pilot projects demonstrate the feasibility of educational digitalisation and show positive outcomes, even when initial participation involves a minority share of beneficiaries. These initiatives have acted as *proof-of-concept*, spurring new programmes launched in 2025, for example Sahar in partnership with grassroots networks, and *Secret Scholars Online*, a flexible, teacher-supported programme offering Afghan women and girls interactive English and Mathematics courses from beginner to advanced levels via the *Learning Upgrade platform*[52]. These cases indicate that, where pedagogical support, safety and low-tech access are assured, provision can be scaled gradually while maintaining quality and inclusivity.

5. Conclusions

Across the Palestinian and Afghan cases, the digital transformation of education should not be read as a linear vector of modernisation, but as a socio-technical assemblage of resilience and resistance shaped by distinct structural constraints. In Palestine, the dominant vulnerabilities are infrastructural and security-related (destruction of schools and networks, power intermittency, restrictions on movement and information flows), which disrupt instructional continuity and compress institutional delivery capacity. In Afghanistan, the bottleneck is normative, cultural, and strongly gender-related: bans on women's education and work, low basic literacy, access costs, and social-institutional surveillance that reduce effective demand regardless of technical supply.

Comparative findings indicate that positive outcomes arise where programmes are hybrid and low-tech (broadcast radio and TV, low-bandwidth messaging, offline-first content), coupled with pedagogical mediation (targeted tutoring, assessable micro-modules), safeguarding (privacy, data security, protected spaces) and recognition of learning (micro-credentials, employment references). Four systemic fragilities persist in both contexts: intermittent connectivity and dependence on third-party platforms; safety risks for students and staff (surveillance, reprisals); difficulty in assuring the quality and transferability of credentials; and financial volatility and discontinuous project cycles.

Theoretically, these cases show that digital resistances are situated reappropriations. They articulate digital educational sovereignty against the asymmetries of *platformisation* and data *colonialism*, translating the three ethical pillars discussed earlier (equity, transparency, integrity) into concrete choices. In this perspective, digitalisation works when it is enabling in relation to EHEA values (academic freedom and integrity, institutional autonomy, participation), not when it substitutes them with mere technical efficiency.

Operational implications diverge across the two countries. In Palestine, where digital education has been invested in for decades at national level and through international bodies and the Palestinian diaspora, and where there is broad familiarity with teaching tools, priorities are the protection of civil infrastructure (energy, networks, devices), the creation of technical-humanitarian corridors for continuity of digital services, and the definition of minimum Service Level Agreements (SLA) and emergency continuity plans

[52] Sahar. *https://www.sahareducation.org/current-programs*. [last access 15 October 2025].

for teaching. In Afghanistan, effectiveness is possible only by circumventing gender barriers (women-only community hubs, asynchronous and home-based delivery, peer mentoring), by sequencing basic digital literacy before advanced provision, and by adopting privacy-by-design protocols. In short, digitalisation works when three criteria are met: additionality (closing real gaps without replacing what already exists), safety first (data, access, psychosocial support) and usability (English, STEM and ICT with verifiable micro-credentials). Only under these conditions can it shift from emergency response to durable educational capital, reducing the risk of amplifying structural inequalities in both contexts.

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