



The digitalisation of global surgery education as a catalyst for surgical equity

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Cite as: Elsheikh R, Veiga Adriana L, Kihunyu Alex M, Jose Anna M. The digitalisation of global surgery education as a catalyst for surgical equity. *Impact Surg*, 3(2), 383–385. <https://doi.org/10.62463/surgery.315>

As an emerging multidisciplinary field, global surgery strives to ensure that every person, regardless of geography or income, can access timely, safe, and high-quality surgical care. This requires strengthening health systems and ensuring inclusion of underserved communities. A decade of global advocacy elevated surgical care on policy agendas, yet measurable progress remains insufficient, with widening disparities in access and quality.

The 2015 Lancet Commission on Global Surgery revealed a staggering scale of unmet surgical needs, with five billion people lacking access to safe, timely, and affordable surgical and anesthetic care. This inequity translates into 143 million additional surgical procedures required annually in low- and middle-income countries (LMICs) to avert preventable death and disability. Yet, of the 313 million procedures performed worldwide each year, only 6% occur in the poorest regions, where surgical disease burden is highest¹. Updated modelling now places the unmet need at a minimum of 160 million procedures per year, reflecting how surgical expansion has not kept pace with demographic shifts, aging populations, and rising disease burden². This is further complicated by the high rates of postoperative mortality, which accounts for 3.5 million deaths each year, surpassing mortality from HIV, malaria, and tuberculosis combined².

Education sits at the heart of this mission. In LMICs, where the surgical burden is greatest³, training opportunities remain acutely limited. A broader neglect of surgical education can also be seen in high-income countries, with only 10.6% of UK medical students reporting any prior exposure to global surgery⁴. If education is the foundation for building surgical capacity, then identifying and dismantling the barriers that hinder educational access must become a defining priority. Yet current data reveal that fewer than half of LMICs are on track to meet minimum workforce density benchmarks, reflecting persistent training limitations and a lack of sustained investment in human resources for health².

A central challenge is the global shortage of the surgical workforce. Many LMICs fall far below the recommended threshold of 20 surgeons, anesthesiologists, and obstetricians per 100,000 population¹. Despite the development of national surgical, obstetric, and anaesthesia plans in several countries², most remain unfunded, leaving structural bottlenecks unresolved and hindering expansion of both workforce and service delivery. Training capacity is constrained by limited positions, under-resourced facilities, and a scarcity of qualified educators. The absence of standardized curricula, together with inadequate mentorship and infrastructure, further impede progress⁵. Partnerships between high-income countries (HICs) and LMICs have made valuable



contributions but have also raised ethical and contextual questions: How can curricula be standardised while remaining sensitive to local contexts? What mechanisms can attract and retain educators in resource-limited settings? And how can technology sustainably bridge these gaps?

Digital transformation offers a paradigm shift. Once considered supplementary, e-learning has evolved into a transformative and scalable mechanism to democratise surgical education. Digital platforms can transcend geographic, economic, and linguistic barriers, enabling equitable access to structured, peer-reviewed content and mentorship. Low-bandwidth, mobile-first designs are proving especially practical in LMICs, where advanced immersive technologies remain largely out of reach, though their long-term potential is undeniable⁶. Beyond education, digital systems are essential for addressing longstanding gaps in data collection, enabling consistent measurement of access, procedural volume, and postoperative outcomes, all of which remain inconsistently measured in most countries².

The viability of digital models is increasingly clear. The Global Academia of Surgeons, a non-profit online learning platform, delivers expert-led curricula to learners from 100 countries⁷. Similarly, SURGhub, the United Nations Global Surgery Learning Hub, provides structured learning pathways through peer-reviewed resources and interactive case discussions. Since its launch, it has enrolled over 10,000 learners from 190 countries, more than half from LMICs⁸. These initiatives exemplify how digital education can bridge divides in opportunity and knowledge.

Digital platforms do more than transfer knowledge; they are reshaping the educational ecosystem. The International Student Surgical Network (InciSioN) illustrates the transformative digital engagement. Since its inception in 2016, InciSioN has expanded to over 5,000 members across 75 countries⁹, fostering research capacity and mentorship through initiatives such as the InciSioN Research Capacity-Building (IReCaB) program. By leveraging distributed mentorship, such networks cultivate professional growth, global collaboration, and long-term engagement with global surgery¹⁰. To sustain and scale these innovations, a coordinated framework for action is essential.

Policymakers and accreditation bodies must formally integrate digital learning into national training systems, ensuring recognition of online-acquired competencies. Academic and professional institutions should co-develop globally relevant curricula, promote virtual clinical exchanges, and embed remote simulation technologies into training programs. Governments, donors, and international funders must invest in the infrastructure that enables equitable participation. These include reliable connectivity, mobile-optimised and multilingual platforms, and affordable simulation tools.

The Lancet Commission defined the scale of the global surgery crisis; digital innovation now provides the tools to confront it. The pursuit of surgical equity requires reimagining how the world teaches, learns, and shares knowledge. Embracing digital education as the cornerstone of global surgery is both a moral and strategic necessity, one that can help close the workforce gap and bring the vision of universal access to safe, affordable surgical care. The coming decade must prioritize integrated infrastructure investment, strengthened data ecosystems, and scalable digital training models to ensure surgical care becomes a resilient and equitable component of universal health coverage.

Funding: This research received no external funding.

Conflicts of Interest: The authors declare no conflicts of interest.

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