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Global Higher Education Knowledge Production

Indicators, Dynamics, and Implications

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Global Higher Education Knowledge Production:

Indicators, Dynamics, and Implications

REPORT 2025

The International Centre for Higher Education Innovation under the auspices of UNESCO (UNESCO-ICHEI) is a category 2 centre jointly established by UNESCO and the Shenzhen Municipal People's Government of the People's Republic of China. Leveraging the advantages of Shenzhen's digital technology industry, UNESCO-ICHEI addresses the digital transformation needs of developing countries by fostering innovation in higher education institutions through digitial and AI competency of the higher education workforce.UNESCO-ICHEI works closely around the UN's Sustainable Development Goal 4 (Education 2030).

Southern University of Science and Technology (SUSTech) is an innovation-oriented public university founded by Shenzhen government in the background of China's higher education reform. It aspires to be a model and pioneer for promoting higher education reform. It is committed to serving the mission of promoting Shenzhen as a modern, international, and innovative city and China as a creative country. SUSTech is widely regarded as a trailblazer and innovator in advancing China's higher education. It was officially approved by the Ministry of Education in April 2012.

The Center for Higher Education Research (CHER) of Southern University of Science and Technology is a teaching and research institute founded in June 2015. Since May 2018, CHER has been affiliated to the newly established School of Humanities and Social Sciences. The research areas of academics at CHER include higher education policies and governance, the modern university system and university reform, the internationalisation of higher education, the development of higher education and regional development, ICT-supported learning and teaching in higher education.

The X&Y Research Team is jointly led by Principal Investigators Catherine Yuan Gao and Xu Liu. The team comprises two visiting professors, one postdoctoral researcher, one senior data consultant, two data technicians, and seven visiting doctoral researchers from leading global institutions, including the University of Oxford, the University of Hong Kong, the Chinese University of Hong Kong, the University of Illinois, the University of Maryland, and Xiamen University. The team's research agenda spans natural language processing and knowledge production in higher education, higher education and social transformation, innovative talent development, and the advancement of higher education in the GBA area.

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Glossary

AQRF	ASEAN Qualifications Reference Framework
ASEAN	the Association of Southeast Asian Nations
BCE	Before Common Era
CM	Critical Mass
CNKI	China National Knowledge Infrastructure
CoP	Community of Practice
DEI	Diversity, Equity, and Inclusion
EBSCO	Elton B. Stephens Company
ECNU	East China Normal University
EECA	Russia, Ukraine, the Caucasus, and Central Asian Republics
EFL	English as Foreign Language
ERIC	Education Resources Information Center
ESCI	Emerging Sources Citation Index
ESRC	Economic and Social Research Council
EU	European Union
EU–LAC	European Union – Latin America and Caribbean
FREX	Frequency and Exclusivity
HM	Hidden Mass
HSS	Humanities and Social Sciences
IJOLE	International Journal of Language Education
LA	Latin America
MAP	Maximum a Posteriori Probability
MENAT	North Africa and the Middle East
NER	Named Entity Recognition
NLP	Natural Language Processing
NSF	National Science Foundation

NSFC	National Natural Science Foundation of China
OECD	Organisation for Economic Co-operation and Development
PRC	The People's Republic of China
QRF	Quality-Related Funding
QS	Quacquarelli Symonds
R&D	Research & Development
RCUK	Research Councils UK
REF	Research Excellence Framework
SAJHE	South African Journal of Higher Education
SAR	Special Administrative Region
SARS	Severe Acute Respiratory Syndrome
SciELO	Scientific Electronic Library Online
SSA	South and Southeast Asia
SSCI	Social Sciences Citation Index
STEM	Science, Technology, Engineering, and Mathematics
STM	Structural Topic Modelling
UKRI	United Kingdom Research and Innovation
UKRIO	UK Research Integrity Office
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WBL	Work-Based Learning
WIL	Work-Integrated Learning
WNSE	Western, Northern, and Southern Europe
WoS	Web of Science

Executive Summary

This report maps the evolution of global higher education research from 1991 to 2024, examining how knowledge about higher education is produced, circulated and governed across global, regional and national scales. It traces who contributes to the field, where research is generated, the venues through which it is disseminated, the thematic directions it prioritises, and how collaboration networks have shifted during a period of profound transformation in the global higher education landscape. These patterns are situated within wider developments, including the massification of higher education, technological and demographic change, intensifying global interdependence, and shifts in national policy frameworks.

Higher education systems worldwide have moved from elite to high-participation models, shaped by intersecting global and local forces. Globalisation, regional integration, competition, and performance measurement have altered the governance of universities and academic work, while nation-states continue to exert decisive influence through funding systems, regulation, migration policy, and research priorities. Understanding these dynamics requires a glonacal perspective that views the global, national and local as interconnected rather than hierarchical. Within this context, higher education research has rapidly expanded and become more institutionalised, supported by an increasing number of journals, conferences, research centres and postgraduate training pathways. Yet this field remains embedded in an uneven global science system dominated by English-language publishing, which shapes the visibility of scholarship from the Global South and from non-English national contexts.

Existing attempts to map the field have provided valuable insights but are often limited in scope, scale or methodological breadth. This Global Higher Education Knowledge Production Report 2025 addresses these limitations through large-scale, multi-scalar datasets and systematic data-driven analysis. The report offers an integrated empirical account of how higher education knowledge is produced and organised globally, how regional and national systems differ, and what these patterns imply for the future development of the field.

The analysis is grounded in purpose-built datasets drawn from major indexing platforms. The global dataset comprises 213,492 English-language higher education articles indexed in Web of Science (WoS) between 1991 and 2024. At the regional level, this corpus is divided into a Global South dataset of 21,616 publications (8,546 from Africa; 5,819 from South America; 7,510 from Southeast Asia) and a Global North dataset of 147,808 publications, allocated by author affiliation. At the national level, the report

examines the United States (82,473 publications), the United Kingdom (22,336) and Mainland China[1] (7,653 English-language WoS articles). To address the Anglophone bias of international indexing, the report incorporates a further 99,975 Chinese-language higher education articles from CNKI core journals (1992–2024), constructed using aligned conceptual criteria and strict quality filters.

Analytically, the report integrates bibliometrics with Structural Topic Modelling (STM) to capture structural patterns and semantic evolution within the field. Bibliometric methods trace publication trends; identify active scholars; map collaboration through co-authorship networks; and locate centres of knowledge production and dissemination using institutional affiliation data and Named Entity Recognition. STM is applied to WoS abstracts to generate a 55-topic global model, selected through rigorous diagnostics and qualitative assessment, and a 41-topic model for the CNKI corpus. The resulting thematic structures are linked to regional and national metadata to compare topic prevalence, cluster related themes and track long-term trajectories. Python is used for large-scale data processing, while R supports STM, clustering and temporal analyses, ensuring both computational efficiency and methodological rigour.

[1] For statistical purposes, this report uses "Mainland China" to refer to the mainland of the People's Republic of China, excluding the Hong Kong Special Administrative Region (Hong Kong SAR), the Macao Special Administrative Region (Macao SAR), and the Taiwan region of China.

Global Landscape of Higher Education Knowledge Production

Finding 1. Global higher education research has expanded rapidly but remains highly uneven in volume and participation

Over the past three decades, higher education research has expanded from a relatively small, specialist domain into a sizeable and increasingly coherent global field. Between 1991 and 2024, 213,492 higher education articles were published in WoS, rising from 297 papers in 1991 to 21,597 in 2024. This growth is concentrated in three phases: a modest build-up to 2004, rapid globalisation from 2005–2014, and large-scale consolidation after 2015. Over time, the number of participating countries increased from 96 (Phase I) to 159 (Phase II) and 192 by 2024, indicating the emergence of a genuinely global research space. Yet production remains highly skewed. The United States alone accounts for more than one third of all publications, and among the top ten producing countries only Mainland China, Taiwan, China and South Africa are from the Global South. The expansion of participating systems has therefore diversified the map of contributors without eliminating the dominance of a small group of Global North countries.

Finding 2. A small "critical mass" of scholars underpins global output, while a large, interdisciplinary "hidden mass" sustains breadth

The 213,492 papers were authored by 407,716 individuals. Only 8,319 of them (2%) meet the report's definition of "active agents" (at least five papers within any rolling five-year window), yet they co-produce over one third of all publications. This group of scholars form the critical mass of the field. Most of these scholars are clustered in anglophone and established research systems, with the number of active agents rising from 158 in 22 countries in Phase I to 7,813 in 112 countries in Phase III. By contrast, the "hidden mass" of 399,397 authors (97.96%) contributes two-thirds of total output, but usually only once or twice and often from other disciplinary strands (notably medicine, science, engineering and broad education). This structure supports both disciplinary consolidation and high interdisciplinarity: a small, coherent core sets agendas and methods, while a much larger, dispersed group channels perspectives and techniques from multiple fields into higher education research. It also reflects that higher education research is moving towards Mode 2 knowledge production.

Finding 3. Institutional centres of higher education research have multiplied and diversified

At the institutional level, the number of universities contributing to global higher education research has grown markedly, from just over 1,200 in the early phase to more than 5,000 in Phase III. Within this expanding universe, a relatively small group of universities functions as major knowledge production centres. The top 50 institutions, initially dominated by universities in the United States and the United Kingdom, now include growing numbers of universities in Australia and, more recently, entrants from Mainland China and South Africa. Nineteen universities appear in the top-50 list across all three phases, indicating that once a strong research infrastructure and tradition are established, institutional influence in the field tends to be durable.

Finding 4. Knowledge dissemination is concentrated in a limited set of English-language, often interdisciplinary journals

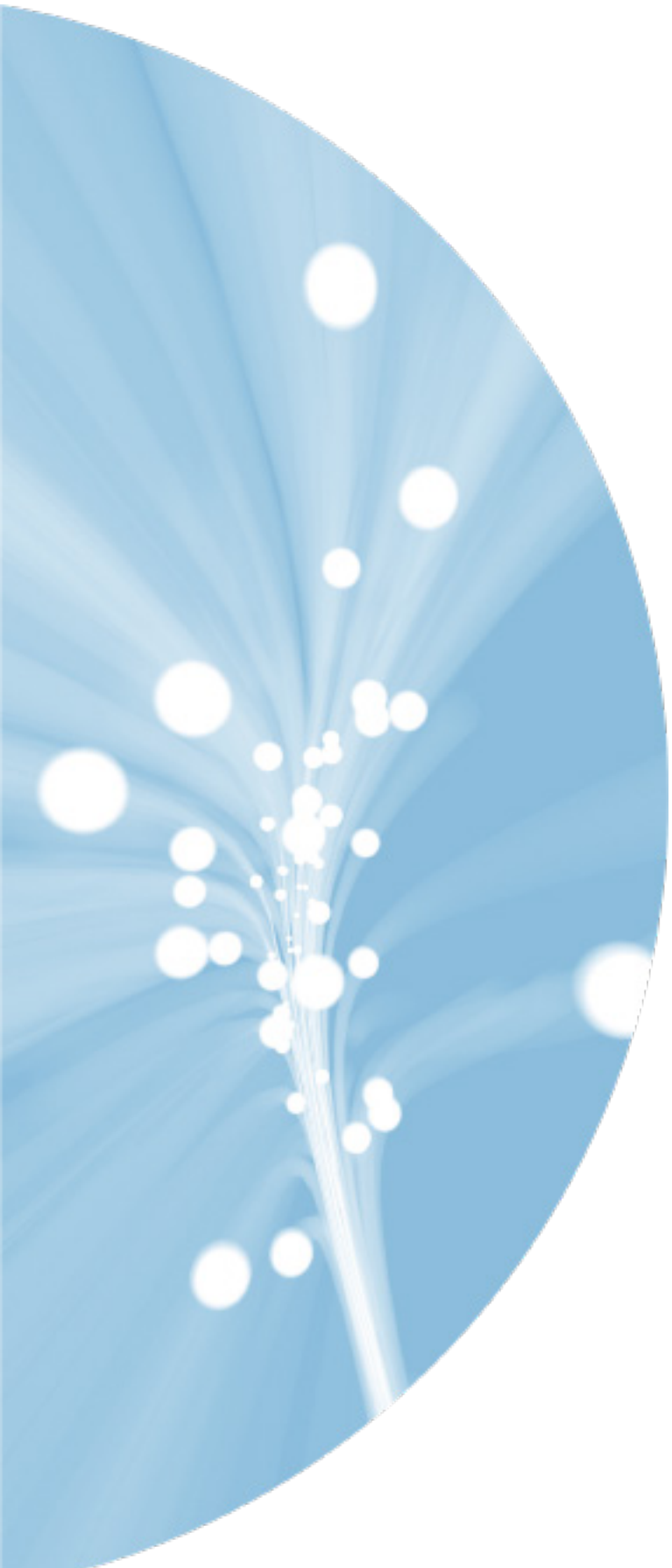
Higher education research is disseminated through more than 1,000 journals worldwide, yet publication is heavily concentrated in a smaller group of "key venues". Just over 250 journals publish more than 100 papers in any five-year period and together account for nearly 70 per cent of all indexed outputs. These venues are overwhelmingly English-language and include substantial numbers of journals in medical, health, science and engineering education, reinforcing the field's interdisciplinary character. Their publishers are concentrated in a few dozen countries, with the United Kingdom now surpassing the United States as the leading base for key journals. At the same time, there is a growing but still under-recognised layer of national and regional journals publishing in local languages, whose contributions remain only partially visible in global databases.

Finding 5. Collaboration has intensified, but is still dominated by domestic and regional ties and structured by Global North hubs

Co-authorship is now the norm in higher education research, but team sizes remain relatively small (typically one to three authors, with papers above six authors rare). Single-authored papers have declined from over one third of output in the late 1990s to roughly half that share by 2024, indicating a shift toward collaborative inquiry while retaining space for individual scholarship. Domestic co-authorship remains the dominant mode of collaboration, accounting for the majority of jointly authored papers, while international and cross-regional partnerships have grown but still constitute a minority. Regional analysis shows that North America and Western/Northern/Southern Europe (WNSE) function as principal global hubs, with Oceania acting as a bridge between Asia and the Anglophone world. The most frequent partnerships occur among English-speaking countries, and some regions—such as South America, parts of Sub-Saharan Africa and the EECA region—remain weakly connected to the wider network. These patterns highlight the continued importance of geography, language, historical ties and regional frameworks in structuring collaboration opportunities.

Finding 6. Thematic agendas are broad, interdisciplinary and shaped by powerful national traditions

Using STM, the report identifies 55 distinct research topics at the global scale, spanning student experience, teaching and learning, economics and policy, governance, equity and inclusion, professional and clinical education, language and literacy, and research methods. The largest topics focus on bridging learning, practice and research, and on theories and discourse, indicating that the field remains anchored in both practice-oriented inquiry and conceptually rich debate. A strong presence of topics in medical, health, science and engineering education reflects the contribution of scholars based in these disciplines and the historical influence of the U.S. research traditions, given that the United States accounts for a substantial share of global publications. Overall, the thematic structure confirms higher education's status as a highly interdisciplinary field whose agendas are unevenly shaped by dominant national and sectoral priorities.



Finding 7. Research priorities are shifting towards digitalisation, wellbeing and practice-oriented, data-driven inquiry

The evolution of topic prevalence since the mid-2000s reveals a clear reorientation of the field. Topics related to digital and online learning, student mental health and wellbeing, identity and belonging, sustainability, internationalisation and entrepreneurial education show sustained growth, while more traditional policy, assessment and structural themes have declined. Methodologically, quantitative and experimental approaches—especially statistical analysis and simulation-based medical skills training—are expanding, alongside stable use of scale development and bibliometric methods. Qualitative and interpretive approaches remain widely used but are less often the central focus of publications. Taken together, these trends point to a field that is increasingly empirical and data-driven, more attentive to student experience and global challenges, and oriented towards applied knowledge that can inform educational practice and reform.

The Global South Higher Education Research Space

Finding 8. Global South participation remains limited but increasingly shapes its own agendas

Across three decades, countries in the Global South have produced only about one-tenth of all WoS-indexed higher education articles, and less than 3 per cent of Southern authors (608 in total) form a sustained "critical mass" of active scholars, underscoring the persistence of structural under-representation. Collaboration patterns are strongly asymmetric: a sizeable share of Southern outputs involve Northern partners, while only a small fraction of Northern publications include Southern collaborators. Yet almost all key global journals publish work from the Global South, and topic analysis shows both convergence with Global North priorities and distinct emphases on quality assurance, entrepreneurial education and quantitative methods. These patterns suggest that, while embedded in unequal structures, Global South scholars are gradually reshaping what counts as relevant and legitimate knowledge and moving towards greater epistemic autonomy.

Finding 9. Southeast Asian higher education research is rapidly expanding and strongly developmentalist

Southeast Asia has moved from producing only a handful of papers per year in the 1990s to more than 1,200 annually by the mid-2020s, accounting for around 3.5 per cent of global higher education output. This growth is driven by policy agendas centred on modernisation, "world-class" universities and research capacity building, with Malaysia, Indonesia and Singapore leading regional contributions. A relatively small but significant critical mass of active scholars (297) is heavily concentrated in a few flagship universities and combines strong roots in education with above-average representation from engineering and economics backgrounds. The region's agenda is distinctly applied and developmentalist, prioritising entrepreneurial education, quality assurance, EFL education, quantitative methods and digital transformation, and aligning higher education closely with economic development and employability goals.

Finding 10. Latin America couples regional publishing infrastructures with a critically reflexive research agenda

Latin America contributes less than 3 per cent of WoS-indexed higher education publications, but this significantly underestimates its real output because much of its scholarship circulates through Spanish- and Portuguese-language journals in platforms such as SciELO and Redalyc. Within WoS, a small critical mass of active scholars (102) is concentrated in a limited number of universities, yet regional and multilingual journals managed from Brazil, Cuba and Colombia occupy a prominent position as key dissemination venues. The region's research agenda is the most sociologically and theoretically oriented among the Global South cases, marked by strong engagement with historical and bibliometric reflection, socially grounded professional formation, regionally rooted theorisation and robust disciplinary traditions in STEM education. This combination of regional infrastructures, dual publication strategies and epistemically self-conscious themes expresses a deliberate project of epistemic autonomy rather than simple incorporation into Northern paradigms.

Finding 11. African higher education research centres decolonisation amid highly uneven internal capacities

Africa accounts for the largest WoS-indexed higher education output among the three Global South regions, but this production is heavily concentrated in South Africa, which dominates publication volume, institutional contributions and the pool of active scholars (215). African authors publish in a wide range of international journals, yet the leading WoS-indexed venues are overwhelmingly South African, and scholarship from Francophone and Lusophone systems remains largely invisible in global indexes. The region's research agenda is distinguished by the centrality of decolonisation, alongside strong engagement with theory, bridging learning and practice, system-building topics such as quality assurance and academic integrity, and a substantial combined focus on health professions education. Together these emphases reflect an agenda that links epistemological critique with efforts to align universities more closely to societal needs under conditions of historical marginalisation and resource constraint.

Finding 12. Diverse regional trajectories in the Global South challenge simple centre–periphery models

A comparative view of Southeast Asia, Latin America and Africa shows that the Global South cannot be understood as a single, homogeneous periphery. The regions differ in publication volume and internal concentration, disciplinary profiles, venue strategies and thematic priorities: Southeast Asia pursues applied, quantitatively oriented and entrepreneurship-focused agendas; Latin America foregrounds reflexive, theoretically rich and regionally grounded scholarship; and Africa combines decolonial critique with strategic engagement in health and system-development topics. All three confront similar structural constraints—limited resources, linguistic hierarchies and under-representation in major indexes—but respond in distinct ways that reflect their histories and policy environments. These differentiated trajectories point towards a glonacal ecology of knowledge in which multiple regional knowledge spaces negotiate with, rather than simply mirror, Northern-dominated global science.

National Higher Education Research Spaces

Finding 13. The United States leads global higher education research through scale and public research universities, but remains strongly domestically oriented

The United States is the largest producer of higher education research, contributing 82,473 WoS-indexed publications between 1991 and 2024 and close to two-fifths of global output across the period. This position is underpinned by a dense ecosystem of large public research universities (R1 "very high research activity" institutions) that supply the bulk of scholarly labour, research infrastructure and doctoral training. Although co-authorship has risen sharply—with more than four-fifths of recent papers jointly authored—collaboration patterns remain predominantly domestic, and international co-authorship, while growing, still forms a minority of activity. The thematic agenda centres on pedagogy and student experience, with rising attention to psychology, digital learning and diversity, equity and inclusion, and a gradual shift from purely quantitative, measurement-driven approaches towards more qualitative and interpretive methodologies.

Finding 14. The United Kingdom converts a smaller research base into outsized discursive power via editorial gatekeeping and international collaboration

The United Kingdom produces roughly a quarter of U.S. higher education publication volume (22,336 WoS-indexed papers over 1991–2024), yet it consistently ranks as the second-largest national contributor and, more importantly, the leading global hub of knowledge dissemination. Hosting just over 40 per cent of key higher education journals, the U.K. wields substantial editorial and discursive influence that far exceeds its size. Its research system is shaped by a centralised, evaluation-driven funding regime (dual-support and the REF), which reinforces alignment with international journal conventions and encourages extensive cross-border collaboration. By 2024, international co-authorship in U.K. higher education research had grown to nearly half of all outputs, with strong links to the U.S., Europe and Commonwealth partners. The thematic profile mirrors the U.S. focus on pedagogy and student experience but gives comparatively greater prominence to academic integrity and policy/economics of higher education, underpinned by strong behavioural and social science funding.

Finding 15. Mainland China's participation in global higher education research space is rapidly expanding, highly collaborative and strongly practice- and technology-oriented

In the global (WoS) arena, Mainland China has moved from a marginal presence to a significant producer of higher education research, with its world share rising from about 0.3 per cent in the early 1990s to nearly 5 per cent in 2015–2024. Publication output has grown especially quickly since the mid-2000s, supported by substantial R&D investment and expanding university research capacity. Chinese higher education researchers display a propensity for collaboration, with around 84 per cent of outputs co-authored and domestic and international partnerships both playing major roles, though domestic collaboration has become increasingly prominent in recent years. Internationally, Mainland China is tightly connected to established Anglophone producers (the United States, United Kingdom, Australia) and to neighbouring systems such as Malaysia and Singapore. The thematic agenda in this global space centres on micro-level, practice-oriented topics. These include classroom instruction, entrepreneurial education, student professional preparation, English-language learning, and internationalisation. Work on digital and online learning is also growing rapidly. Together, these patterns show strong national priorities in technology and talent development. Theoretical and discourse-focused topics are comparatively less visible, pointing to a strong problem-solving ethos even when operating within international publication circuits.

Finding 16. Mainland China's national research space sustains a much larger, macro-oriented and policy-driven higher education knowledge system

Within the national Chinese-language system captured by CNKI, higher education research is both larger in scale and differently configured than in WoS. Output expanded rapidly from the early 2000s before stabilising and declining slightly after the mid-2010s as core-journal criteria tightened, and the community of active researchers likewise grew quickly and then consolidated. Collaboration is overwhelmingly domestic and has increased to well over two-thirds of publications. The thematic profile focuses on macro-level issues such as nation-building, the history and ideas of universities, regional development, governance, legal frameworks and economic considerations. It also includes strong attention to problem-solving approaches. Together, these priorities show that higher education research is used mainly to support national development and institutional reform rather than to primarily pursue theoretical innovation.

This report presents the most comprehensive empirical mapping to date of global higher education knowledge production, tracing how the field has expanded over three decades from a marginal, nationally bounded activity into a substantial, institutionalised and internationally networked domain. By combining bibliometrics, STM and comparative case studies, it establishes a baseline infrastructure and conceptual lens for understanding how knowledge about higher education is generated, circulated and mobilised.

The report emphasises that higher education research is not neutral. It shapes how universities define their missions, how policymakers design reforms and how societies imagine the purposes of higher education. In doing so, it contributes to the formation of social order, influencing whether systems promote mobility or reinforce inequality, support democratic capacities or technocratic managerialism, and prioritise public goods or market competition.

Clear limitations remain. The reliance on the WoS database, dominated by Western and English-language publications, captures only part of global scholarship. Analysis of CNKI highlights the scale and richness of national-language research that remains invisible internationally, with similar gaps likely across many countries. The focus on journal articles also omits influential books, policy reports and practice-oriented outputs. Future work must draw on more diverse data sources, languages, platforms and document types to provide a fuller picture.

Looking ahead, the report calls for a more inclusive and interconnected global knowledge commons, supported by open science, multilingual dissemination, fairer collaboration regimes and stronger investment in local journals and data infrastructures. It identifies several emerging frontiers. These include AI-driven learning, digital ecosystems, geopolitics, demographic change and new credential systems. Each area will require new methods and new forms of collaboration. To monitor these developments, our team proposes a rolling five-year cycle of global reports complemented by thematic special studies, aiming to sustain a cumulative, comparative and reflexive knowledge base for navigating the complex transformations ahead.

Part

A

Historical Overview of Global Higher Education Development

A1. HIGHER EDUCATION BEFORE THE END OF WORLD WAR II

The roots of higher learning stretch back to the Axial Age (800–200 BCE), when philosophical traditions emerged across Greece, India, and China. Thinkers such as Socrates, Confucius, and the Buddha established enduring modes of inquiry, yet their teachings operated through itinerant or informal schools rather than permanent institutions. Systematic institutionalisation did not occur until the High Middle Ages (11th–13th centuries), when Western Europe created the university as a corporately structured entity supported by Church and State (Scott, 2006; Beetham, 2024). This marked the transition from dispersed intellectual communities to enduring organisations with legal personality and transnational authority.

From the Middle Ages to the mid-twentieth century, higher education evolved within an elitist paradigm characterised by restricted access, religious and monarchical influence, and a mission centred on conserving established knowledge. Early universities, such as Bologna, Paris, and Oxford, were established through papal or royal charters as *studia generalia*. Their dual location "between crown and God" granted them autonomy but also embedded them within ecclesiastical and aristocratic power structures (Scott, 2006). Participation was tightly controlled. Enrolment was limited to elite males with the requisite Latin literacy, doctrinal conformity, and social standing. By the late fifteenth century, Europe had fewer than 100,000 university students (Rüegg, 2006). Anderson (2006) describes the university not as a space for the many but as an institution reproducing the cultural capital of ruling classes. Trow (1973)'s typology similarly categorises pre-industrial systems as "elite," with participation rates typically below 15 per cent.

The intellectual mission of universities during this period remained conservative. Institutions functioned as "ivory towers," focused on philosophical commentary, canonical texts, and scholastic reasoning rather than broader societal engagement (Matthews, 2022). Knowledge production relied on deductive reasoning and textual authority rather than empirical inquiry (Scott, 2006). While Enlightenment thinkers and reformers like Kant and Humboldt advanced the ideal of integrating *Lehre und Forschung*, this research model remained confined to a small group of elite institutions and took time to materialise (Jaldemark et al., 2022; Matthews, 2022). Higher learning was still conceptualised as a self-initiated pursuit of refinement rather than a structured system of professional training (Bislev et al., 2011).

The elitist university was a mechanism of social reproduction. Its core function was to cultivate national elites, not to expand opportunity or promote meritocratic mobility. The architecture, rituals, and symbolic authority of many historic universities continue to reflect this formative period, demonstrating the lasting influence of medieval institutional design.

A2. MASSIFICATION OF HIGHER EDUCATION IN DEVELOPED DEMOCRACIES

After World War II, higher education in developed democracies shifted from elitist systems to mass participation. Massification was driven by strong economic growth, expanding welfare states, democratisation, and the rise of knowledge-based economies. These structural changes created both the demand and political support for large-scale participation in tertiary education, transforming its role from elite formation to a broad social and economic service.

The United States was among the earliest to expand. Federal initiatives such as the GI Bill and substantial state investment opened access on an unprecedented scale. By the 1970s, higher education in the United States had entered into the mass regime (Geiger, 2017). The American system evolved into a diversified hierarchy, including community colleges, state universities, and research-intensive institutions.

In the United Kingdom, the 1963 Robbins Report captured the ethos of the period, asserting that all with "ability and willingness" should have the opportunity for higher education. Enrolment expanded sharply, with gross tertiary participation rising from around 8 per cent in 1960 to over 20 per cent by 1980 (Tight, 2009). Subsequent data from the World Bank and UNESCO UIS show continued acceleration through the late twentieth century. State-led expansion sought to dismantle elite privilege and reposition higher education as a vehicle of equity and mobility.

Australia experienced a similarly profound transformation. In 1960, university enrolments were approximately 50,000 (4–5 per cent). Reforms under the Whitlam government abolished tuition fees and increased public funding, lifting enrolments beyond 200,000 and raising the gross enrolment rate to about 15 per cent by 1975. By 1990, participation exceeded 30 per cent (Marginson, 1997). Structural integration across colleges and universities accompanied this growth, alongside a shift toward marketisation and increased international recruitment.

Across these systems, massification expanded higher education from a privilege of elites to a public expectation. Yet persistent inequalities in access, field distribution, and completion remained, shaped by class, race, gender, and prior schooling quality. Curricula also broadened and vocationalised. Institutions responded to labour market needs and

diverse learner cohorts by expanding professional fields, interdisciplinary programs, flexible pathways, and lifelong learning opportunities. These developments challenged the classical liberal model of disciplinary depth and academic autonomy. The expectations of governments, employers, and non-traditional learners increasingly shaped curriculum design.

Epistemic orientations shifted in parallel. Massification contributed to the rise of "Mode 2" knowledge production which is application-oriented, transdisciplinary, and socially distributed (Gibbons, 1994). Universities expanded applied research funding, especially in STEM fields, and intensified collaboration with industry, government, and civil society. Teaching practices reflected this shift, with problem-based and practice-oriented learning emphasising employability. Massified systems thus produced hybrid institutions committed simultaneously to academic inquiry, professional training, economic innovation, and social inclusion.

While massification broadened opportunity and modernised higher education, it also introduced new tensions. Critics warned of the "McDonaldisation" of higher education: increasing standardisation, commodification, and pressures on academic quality. Rising credential inflation and concern over the marginalisation of the humanities became recurring public debates. For institutions long grounded in elite traditions, navigating these pressures involved ongoing negotiation of identity, mission, and public purpose.

A3.
THE EMERGENCE OF HIGH PARTICIPATION HIGHER EDUCATION SYSTEMS WORLDWIDE

From the 1990s onwards, global higher education entered a new phase characterised by universal or high participation. Unlike earlier massification, which was concentrated in developed democracies, this expansion has been global, reaching middle-income and developing countries. Drivers include globalisation, digital transformation, demographic growth, and the rising centrality of knowledge economies. The global gross enrolment rate increased from 14 per cent in 1990 to 19 per cent in 2000, exceeded 29 per cent by 2010, and reached 41 per cent in 2020. Participation exceeds 80 per cent in several advanced economies, including South Korea and Finland, while large middle-income systems such as China and Brazil have approached or surpassed 50 per cent. Although Sub-Saharan Africa remains at 10–15 per cent, the region is expanding rapidly due to population growth and policy investment (UNESCO, 2022).

Equity in access has improved alongside rising enrolment. Socioeconomic gaps—especially in entry to non-elite institutions—have narrowed in many countries. The United Kingdom, for example, has seen the proportion of low-income students entering higher education nearly double since 2000 (Boliver, 2017). Yet inequalities persist in entry to elite universities and prestigious fields, indicating uneven progress. Gender equity has advanced even more sharply. Women now account for over 53 per cent of global enrolments, and in Europe, North America, and Latin America the share reaches 55–60 per cent (UNESCO, 2022). Women in most OECD countries are more likely than men to complete a bachelor's degree. However, they remain underrepresented in STEM, where they comprise only about 35 per cent of enrolments, signalling continued structural imbalances.

A defining feature of this era is the intensification of cross-border mobility and international interconnectedness. Higher education now operates as a global system, shaped by international student flows, institutional partnerships, and shared research agendas. The number of globally mobile students grew from roughly 2 million in 2000 to more than 5.6 million in 2019, with over half studying in Europe, North America, or Oceania (OECD, 2020). English has become the dominant lingua franca of global academia, and international co-authorship has increased substantially. Global higher education is also characterised by a rapidly expanding transnational research network. International

research collaboration has become central to knowledge production, with the share of publications involving international co-authors rising from about 14 per cent in 2000 to more than 25 per cent by 2020 (UNESCO, 2021).

However, the benefits of international research collaboration remain unevenly distributed. Elite institutions in the Global North dominate high-impact networks, while many universities in the Global South remain structurally disadvantaged due to weaker infrastructure, limited funding, and asymmetrical power dynamics. This has prompted concerns about epistemic dependency and calls for more equitable global knowledge partnerships (Marginson, 2022a). Moreover, internationalisation increasingly intersects with geopolitical tensions and national security concerns. In strategic fields—technology, biomedicine, defence—scientific nationalism has become more pronounced, complicating efforts to sustain open global research systems while balancing national interests.

Global forces

Since the 1990s, higher education has been reshaped by intersecting global forces, including globalisation, regional integration, neoliberal governance, digitalisation, and demographic change. These pressures have redefined institutional roles, governance norms, and patterns of international engagement. Globalisation, characterised by intensified flows of people, knowledge, and capital, now operates as a purposeful strategy through which institutions and governments seek academic relevance and competitiveness (Marginson, 2022b). Digital transformation has accelerated these dynamics. Online learning, MOOCs, and blended delivery have expanded access and loosened geographic constraints, while the COVID-19 pandemic exposed significant disparities in digital readiness across systems (World Bank, 2023).

Regionalisation reinforces these global shifts. The European Union (EU), the Association of Southeast Asian Nations (ASEAN), and other regional blocs have promoted system harmonisation, academic mobility, and shared quality assurance. Initiatives such as the Bologna Process and Erasmus+ have created supranational education spaces and strengthened cross-border cooperation (Gao, 2019).

Neoliberal governance has introduced market principles into higher education. Rankings such as QS, Times Higher Education, and ARWU exert powerful influence, concentrating prestige within a small group of elite universities and encouraging others to emulate their models (Hazelkorn, 2015). The rise of private and cross-border providers has widened participation but also raised concerns about quality assurance and equity. Many universities now position themselves as global actors through branch campuses, joint degrees, and international research networks.

Demographic shifts further drive system expansion. Growing youth populations and rising secondary-school completion in the Global South have intensified demand for tertiary education, while ageing societies in the Global North rely increasingly on international student inflows to meet labour and demographic needs.

Underlying these developments are powerful imaginaries of global excellence and world-class status. Universities pursue international partnerships, research alliances, and global branding both to secure resources and to strengthen their legitimacy within an unequal global field (Marginson, 2018a). The resulting landscape is marked by unprecedented mobility and collaboration but also widening disparities and heightened competition among regions and institutions.

National forces

Despite the intensification of globalisation, nation-states continue to serve as powerful agents in structuring and directing higher education systems. Rather than diminishing, national authority has transformed in nature. It has shifted from direct control to a mode of strategic coordination, yet it remains central in shaping the goals, legal

frameworks, funding arrangements, and international engagements of higher education. As such, the global higher education landscape is deeply mediated by national policies, interests, and institutional capacities.

A major driver of state involvement is the association between higher education and national competitiveness. Governments increasingly view universities as engines of technological advancement, economic productivity, and geopolitical influence. This is visible in knowledge economy strategies that position universities at the forefront of innovation, entrepreneurship, and scientific development (OECD, 2009). Post–World War II United States policy illustrates this logic: the GI Bill and extensive federal research funding expanded a research-intensive system that helped secure scientific leadership during the Cold War (Geiger, 2017). Similar strategic uses of higher education continue today, especially in AI, biotechnology, and clean energy.

Human capital development provides an additional rationale for state intervention. Governments link higher participation rates to labour market demands for highly skilled workers, particularly in STEM fields. Policies support this agenda through doctoral scholarships, investment in applied research, and strengthened vocational pathways (OECD, 2023). Raising completion rates has become a formal policy goal tied to workforce planning and long-term economic resilience.

National funding and regulatory frameworks continue to exert strong influence, even in systems characterised by autonomy or marketisation. Through performance-based funding, quality assurance regimes, tuition rules, and targeted research grants, governments steer institutional priorities toward areas such as STEM expansion, equity, and regional development. Public funding remains the dominant source in many systems, reinforcing the state's role as steward and gatekeeper.

States also shape international mobility through visa rules, bilateral agreements, and research diplomacy, and they regulate degree recognition, accreditation, and institutional status. Their legal and financial authority determines the extent to which institutions can participate in global networks (Marginson, 2022a). In authoritarian or developmental states, this influence is especially pronounced. Higher education is often deployed for nation-building, ideological alignment, and capacity development, as seen in China, Singapore, and several Gulf states. Yet even liberal democracies continue to guide institutional behaviour through law, funding, and accountability

frameworks.

Nation-states therefore remain strategic architects of higher education. Rather than being displaced by global forces, they recalibrate their functions to align institutional missions with national priorities while selectively engaging global norms. Higher education thus operates within a globally interconnected field but remains deeply embedded in national political, economic, and historical contexts.

A glonacal lens

Today's higher education operates within two orthogonal, heterogeneous yet interconnected systems: the global and national systems. To understand higher education and research within this field, adopting a multi-scalar perspective is essential. Marginson and Rhoades (2002) introduced the *glonacal* agency heuristic to reimagine higher education and knowledge production beyond the constraints of national states and markets. In 2022, Marginson refined this framework by incorporating spatial theories from Lefebvre (1991) and Massey (2005), enhancing its interpretability and adaptability. This report adopts the *glonacal* lens to position higher education and research within multiple interrelated spatial scales.

According to Marginson (2022a), space is not a pre-existing blank canvas shaped by people and events. Instead, it emerges through the actions, social practices, and connections of individuals (p. 1371). Space is relational and multiple in nature. Lefebvre (1991) used the metaphor of a flaky mille-feuille pastry to illustrate the layered structure of social space, where numerous social spaces interpenetrate one another without clear boundaries. Space is continually under construction, evolving through ongoing practices and interactions. Multiplicity is a fundamental feature of space-making. Agents, whether individuals, groups, institutions, or states, follow autonomous trajectories shaped by self-awareness and reflexivity (Marginson, 2022a, p. 1372). These agents are connected to their contexts but not necessarily embedded within them (Xu, 2022, p. 134). While agents operate within certain constraints, they retain the capacity to move and respond flexibly.

Space-making in higher education, according to Marginson (2022a), involves three interrelated domains: materiality, imagining, and social practices. The material domain encompasses communication infrastructures, institutions, policies, and economic resources. The imagining domain refers to beliefs, interpretations, discourses, and perspectives. The domain of social practice includes the actions, relationships, and institutional activities that occur within and beyond higher education. These domains interact continuously. Although the imagining domain is shaped by material conditions, it is not determined by them. Together with social practices, imaginaries can reshape material structures.

Marston and Smith (2001) describe scale as a socially constructed metric that differentiates space. Scaled social processes, in turn, shape the production of space (pp. 615–616). Marginson (2022a) outlines that conscious scales in higher education include global, pan-national, sub-national regional, and local levels. These scales are not discrete or hierarchical. Rather, they overlap and intersect, forming fluid and dynamic configurations. Their interactions generate distinctive opportunities and pathways for agency. Social practices and relationships are influenced by diverse scalar forces, and the salience of any particular scale can shift rapidly, depending on context and actor position.

This multi-scalar lens challenges the central–peripheral model by rejecting the notion of a single, fixed centre in global higher education. In this perspective, positional shifts create varying interpretations of space and its interactions. The global higher education space can be viewed either as a field that consolidates hegemony or as a platform that fosters epistemic pluralism and dialogue among diverse intellectual traditions.

Part

B

The Development of Higher Education Research as a Field

B1.
A GLOBAL SYSTEM OF SCIENCE AND KNOWLEDGE PRODUCTION

The emergence of a global higher education space has been accompanied by the consolidation of an autonomous global science system, sustained by transnational scholarly networks, cross-border collaboration, and an integrated publishing infrastructure (Beigel, 2014; Marginson & Xu, 2023). Before the mid-twentieth century, knowledge production was largely national, influenced by domestic funding regimes, linguistic diversity, and country-specific scholarly traditions (Marginson & Xu, 2023; Stockemer & Wigginton, 2019). Digital technologies—especially the internet—have since accelerated cross-border exchange, making international collaboration an increasingly routine feature of academic work (Aksnes & Sivertsen, 2023).

This system is defined by the dominance of English, now the language of over 80 per cent of Scopus-indexed journals and 89 per cent of Web of Science outputs (Elsevier, 2020; WoS, 2020); by convergent epistemic norms across professional communities; and by the centrality of global indexing databases that shape what counts as recognised scientific knowledge (Marginson & Xu, 2023, p.34). Participation, however, is uneven. Anglophone countries have integrated most readily (Marginson, 2022a), while linguistic and institutional

barriers position many non-English-speaking systems on the periphery (Lee & Haupt, 2020; Lloyd & Ordorika, 2021).

Publishing power is similarly concentrated. Five Northern-based commercial publishers—Springer, Taylor & Francis, Elsevier, Wiley, and Sage—produce more than 10,000 journals, while Global South university presses remain underrepresented in major indexes (Nishikawa-Pacher, 2022). This limits visibility for Southern scholarship and constrains epistemic diversity, with many researchers still excluded from high-prestige indexing regimes (Mills, 2024). Yet the system has become increasingly multipolar: since 2016, China has become the world's largest producer of English-language scientific papers, signalling a shift toward broader global participation (Beigel, 2014; Marginson, 2022b).

Inequalities are also evident across disciplines. The social sciences remain marginal in the global knowledge economy, accounting for only five per cent of worldwide publications in 2022 (NSF, 2024). Their research is often deeply embedded in cultural and linguistic contexts (Hayhoe, 1993), making it less compatible with global norms that privilege universality and standardisation (Xu, 2021). Many social scientists publish primarily in local languages and domestic journals (Altbach, 2007; Moskaleva & Akoev, 2019; Warren, 2014). In non-English-speaking countries, globally indexed social science articles constitute only a small proportion of national output (Marginson & Xu, 2023). China, despite its scientific scale, saw social sciences account for only 1.4 per cent of its total publication volume.

Modes of social science knowledge production have also shifted. Mid-twentieth-century research was largely organised around "Mode 1" norms—discipline-based, university-located, and hierarchically structured (Peschke et al., 2023; Tchilingirian, 2018). Since the late twentieth century, "Mode 2" forms have expanded, characterised by transdisciplinary, problem-oriented, and application-focused research (Hoffmann et al., 2019). These practices involve collaborations among universities, governments, civil society, and industry (Atiase, Kolade, & Liedong, 2020), and are increasingly directed toward major societal challenges such as climate governance, migration, inequality, and digital transformation. As a result, social science research now operates within a more interconnected, collaborative, and impact-oriented global environment.

B2.
KNOWLEDGE PRODUCTION IN HIGHER EDUCATION RESEARCH

As a representative research domain within the social sciences, higher education studies exhibit a distinctive interdisciplinary character, drawing upon and integrating methodologies and epistemologies from both the sciences and the humanities. The expansion of the higher education sector and its growing importance in advancing individual development and collective wellbeing have contributed to the flourishing of higher education research. Prior to the establishment of the WoS in 1991, scholarly attention to higher education remained relatively limited. By 2024, however, the number of higher education articles indexed in WoS had reached 216,223. It is important to note that WoS captures only a portion of the global research output in the field, as many publications in higher education research are produced in national languages and are not included in international indexing systems such as WoS.

The flourishing of higher education research has been fundamentally supported by contributions from multiple academic disciplines, each offering

diverse perspectives, theoretical frameworks, and methodological tools. The inherent complexity of higher education necessitates such multidisciplinarity. Because higher education is deeply embedded in broader social, political, and economic systems, understanding its functions and influence requires analysis of both individual behaviours and structural conditions. Many forces shaping higher education originate beyond the sector itself, making interdisciplinary approaches essential for grasping its multifaceted nature, operations, and societal interactions.

Higher education research has long drawn on sociology, political science, psychology, history, economics, anthropology, and cultural studies. This permeability has expanded the field's analytical scope and enabled it to engage broader debates about power, knowledge, equity, and governance. Recent methodological developments have further strengthened the field. New data sources and advances in computational methods, natural language processing, and large language models have enhanced researchers' capacity to analyse large-scale datasets and pursue forms of inquiry previously unavailable, deepening the empirical and conceptual foundations of higher education research.

It is also important to note the evolving relationship between higher education research and other academic disciplines. In earlier stages, when higher education research lacked a defined scholarly community, researchers from other fields often used higher education research as a site for exploring their own disciplinary questions. This reflects a common tension in interdisciplinary work—academic identity and the extent to which researchers identify with a particular disciplinary tradition. Today, however, higher education research has established a distinct intellectual infrastructure. While it remains interdisciplinary, it now has clearly defined research agendas, theoretical frameworks, and methodological norms, as well as a critical mass of scholars who identify primarily as higher education researchers.

Previous Efforts to Map Higher Education Research

Sustained reflection on the development of higher education research is essential for understanding the field's evolution, knowledge structures, and intellectual characteristics (LiCausi & McFarland, 2022). Over recent decades, scholars have mapped the field at multiple scales using bibliometric reviews, content analysis, and historical approaches.

Early work by Bassett and Rumbley (2007) analysed academic journals in terms of titles, publishing countries, languages, and thematic foci. They found strong concentration in English-speaking countries, especially the United States and the United Kingdom, alongside notable growth in Japan, China, Canada, and Australia, as well as increasing multilingual publishing. Tight's series of studies (2007, 2008, 2012) further examined publication patterns. His 2007 comparison of North American and non-North American journals showed that North American publications were dominated by local scholars, focused more on student experience and institutional issues, and displayed clearer methodological structures. He later identified co-authorship and citation "tribes" shaping the field (Tight, 2008), and documented three major trends between 2000 and 2010: rising publication volume outside North America, growing internationalism in leading journals, and increased participation by women (Tight, 2012). Teixeira (2013) added insight into thematic orientations and author composition in major international journals, including the influence of the European Council for Higher Education Research.

Large-scale automated approaches have expanded the field's mapping capacities. Daenekindt and Huisman (2020) applied topic modelling to 16,928 abstracts published between 1991 and 2018, identifying 31 themes that illuminate the conceptual organisation of higher education research. Their inductive approach provides a robust basis for tracing topic development, guiding keyword

selection, and connecting related studies.

Several studies have examined methodological change. Han and Xie (2021), analysing four SSCI-indexed journals from 2000 to 2019, found that methods have become increasingly standardised and diversified. Quantitative analysis remains dominant, though mixed methods are gaining prominence, accompanied by a rising emphasis on theoretical innovation and applied research. Other scholars have analysed ideological developments within the field. Macfarlane (2022) identified three ideological "thought islands"—the pragmatist peninsula, reformist rock, and a growing anti-utopian retreat zone—based on a forty-year analysis of Higher Education Research & Development. His findings show a gradual radicalisation of discourse, increased anti-utopian work, and a shift among pragmatists from micro- to meso-level institutional concerns.

Mapping efforts have also extended beyond publications to academic programs and research infrastructure. Chan (2019), drawing on data from 277 programs, 217 research centres, and 280 journals across 48 countries, demonstrated that scholars in wealthy nations enjoy disproportionate access to research infrastructure, analytical capacity, and trained human capital. Meanwhile, Jones et al. (2020) used descriptive and historical methods to chart the development of higher education research in Canada. They highlighted key themes—governance, internationalisation, equity, diversity, and changing university roles—and noted ongoing disparities in participation among Indigenous and disadvantaged populations. Canada's decentralised system, shaped by 13 provincial/territorial jurisdictions and low private-sector research and development (R&D) investment, has positioned universities as the primary drivers of national research and innovation, resulting in a dispersed and diverse research landscape.

Efforts to delineate the landscape of higher education research have been both valuable and varied, piecing together different segments of this complex field. Despite these efforts, previous practices often exhibit limitations in scope or methodological approach. Many previous studies have relied on a small number of leading journals to identify papers in the field, without developing comprehensive search strategies to ensure maximum inclusiveness. This selection bias can lead to a distorted view of the research landscape. Reviews focusing on singular themes or confined geographical areas, while insightful, may not capture the field's full thematic breadth or global diversity. Conversely, studies aiming for a comprehensive overview typically rely on bibliometric analyses or manual content analysis. Bibliometric methods, capable of processing large datasets, mainly gauge journal and author metrics, offering less insight into the content and thematic organisation of research. Manual content analysis, on the other hand, delves into publications' themes, methodologies, and theoretical frameworks but is time-intensive and thus limited in scale.

To address these limitations, this report has developed specialised datasets that focus on higher education research at multiple scales. By integrating bibliometric methods with automated text analysis, it offers a comprehensive and nuanced mapping of knowledge production in the field across both temporal and spatial dimensions. This mapping serves as a foundational baseline for future efforts to systematically monitor and review the development of higher education research. The following section documents and explains in detail the establishment of the datasets and the analytical methods employed in this report.

Part

C

Data Architecture and Analytical Procedures

C1. DATA SOURCES AND DATASET CONSTRUCTION

Mapping global knowledge production is an inherently complex undertaking, even within a relatively specialised field such as higher education research. Knowledge is generated across a wide range of formats and contexts, including classroom practice, professional activities, policy development, community engagement, and many others. More importantly, knowledge production is an ongoing process rather than a set of final outputs. It is therefore neither feasible nor conceptually meaningful to capture every form or stage of knowledge creation in a single report.

In this report, we make a methodological choice to focus on one specific type of output, namely journal articles published and indexed in major international databases. These publications serve as a practical proxy for examining knowledge production across multiple scales within higher education research. This decision reflects a methodological strategy rather than a conceptual claim about the full nature of knowledge production.

Two limitations must be explicitly acknowledged. First, research articles constitute only a small proportion of the outputs generated through knowledge producing activities. Consultants to this report also reminded us that not all academic papers produce new knowledge. Some reiterate existing ideas, while others may convey information without contributing conceptually or empirically to the field.

Second, reliance on international databases inevitably excludes substantial bodies of scholarship published in national languages. This limitation is particularly pronounced in higher education research, where national context plays a central role in shaping both inquiry and interpretation.

These limitations should be recognised at the outset of the methodology section. Future work will need to address them by incorporating a broader range of knowledge types and by considering the full process of knowledge production. Such efforts will help build a more comprehensive and contextually rich global landscape of knowledge production in higher education.

In this report, we developed a multi-scalar analytical framework that brings together diverse datasets, several levels of analysis, and complementary methodological tools. We employ an innovative mixed methods approach that combines Structural Topic Modelling (STM) with conventional bibliometric techniques. This enables us to capture both the thematic evolution of the field and the structural characteristics of the scholarly landscape. The multi- dimensional design allows us to trace knowledge flows, identify regional particularities, and reveal the intricate interplay between local dynamics and global academic trends across varied geographical and institutional contexts.

Global Data Architecture

Since English functions as the common language of the global science system, the initial selection of databases for the global scale was drawn from widely used Western educational indexes, including Scopus, ERIC, EBSCO, and the WoS. Although Scopus provides extensive coverage, its metadata for higher education research is comparatively limited. ERIC has a narrower disciplinary focus, and EBSCO, which operates as a platform hosting numerous individual databases, poses challenges for achieving consistent and unified data retrieval. Overall, the WoS Core Collection was assessed as the most suitable source for the global scale, as it offers the most stable and reliable coverage for both bibliometric analysis and topic modelling.

To achieve a high level of professional and comprehensive coverage of the higher education research domain, we implemented a systematic search strategy based on three distinct queries, each aligned with a core conceptual dimension. The first query targeted the institutional context through terms such as "higher education," "university," and "college." The second focused on research personnel using terms including "researcher," "scholar," and "faculty." The third addressed the student population by searching for "postgraduate" and "undergraduate." An iterative approach guided the design of these queries, with the initial version refined across five rounds to ensure a balanced level of inclusiveness and relevance.

All searches were first conducted without time limits and produced publications dating back to 1956. A preliminary review, however, showed that many records prior to 1991 did not include abstracts, which are essential for STM. On this basis, we made the methodological decision to restrict the dataset to English language journal articles published between the beginning of 1991 and the end of 2024. The search was further limited to relevant WoS Categories, including Education and Educational Research, Education Scientific Disciplines, Education Special, and Psychology Educational.

The datasets generated from the three queries were then merged, and duplicate records were removed to produce a consolidated dataset. Additional data cleaning was undertaken by checking abstracts, publication type, and document type. The final global dataset contained 213,492 records, sorted by year of publication and assigned sequential identification numbers for subsequent analysis.

Regional Data Architecture

At the regional scale, we adopted the Global South as a central analytical lens to reconsider the limits of the centre - periphery model in explaining knowledge production within the global science system, particularly in the social sciences. This choice is also consistent with UNESCO's emphasis on epistemic justice, which recognises that incorporating marginalised knowledge systems is vital not only for advancing the United Nations (UN) Sustainable Development Goals through contextually grounded insights but also for sustaining a pluralistic and dynamic global knowledge ecosystem.

Region specific datasets were developed by extracting publications from the global dataset according to the geographic affiliation of authors. For comparative analysis, we first compiled an aggregated Global South dataset and constructed a Global North dataset to serve as a reference group. We then selected three representative regions within the Global South, namely Africa, South America, and Southeast Asia, to support comparative analysis across regions.

In this scale of analysis, the terms Global South and Global North are used conceptually rather than as strictly geographical labels. Operationally, the Global South refers to Africa, South America, and Southeast Asia, while the Global North includes North America, the EU, and non-EU European countries. This classification follows established geopolitical frameworks commonly applied in comparative

studies of knowledge production (e.g., Altbach, 2016; Patel, 2020).

The final dataset contained 21,616 publications originating from the Global South. Of these, 8,546 were affiliated with Africa, 5,819 with South America, and 7,510 with Southeast Asia. The corresponding Global North dataset comprised 147,808 publications.

National Data Architecture

At the national scale, we selected three cases, namely the United States, the United Kingdom, and Mainland China. These cases represent distinct knowledge production systems with varied linguistic and institutional characteristics. The United States and the United Kingdom, as English-speaking systems, are comparatively well represented in the WoS. Mainland China provides a more comprehensive perspective as the only non-English speaking system in our analysis, thereby helping to reduce the imbalance inherent in analyses that rely solely on English language sources. Mainland China is treated as a separate national research space, with Hong Kong SAR, Macau SAR, and Taiwan, China excluded, given that each has its own higher education system and distinct context for knowledge production.

Following the same approach used for the regional dataset, subsets for each national case were extracted from the global dataset based on the institutional affiliation of publication authors. A publication was included in a national dataset if at least one author was affiliated with an institution in that country. This procedure produced 82,473 publications for the United States, 22,336 for the United Kingdom, and 7,653 for Mainland China.

However, the relatively modest number of English-language publications from China indexed in the WoS does not adequately reflect the scale of national knowledge production in higher education research. China has a long established and substantial domestic higher education research community, with many scholars choosing to publish in Chinese within a well-developed national academic system (Gao et al., 2025). Relying solely on English language publications would therefore

Table C1. Description of the Datasets in This Report

Dataset	Source Database	Time Span	Publication Type	Language	Final Publication Number
Global	WoS Core Collection	1991-2024	Journal Article	English	213,492
Regional					
Global South					21,616
Africa					8,546
South America	WoS Core Collection	1991-2024	Journal Article	English	5,819
Southeast Asia					7,510
Global North					147,808
National					
USA					82,473
UK	WoS Core Collection	1991-2024	Journal Article	English	22,336
Mainland China (English)					7,653
Mainland China (Chinese)	CNKI Peking University Core Journals	1992-2024	Journal Article	Chinese	99,975

present an incomplete and potentially distorted picture of China's scholarly contributions.

To capture the full scope of China's knowledge production, we complemented the WoS data with records from the China National Knowledge Infrastructure (CNKI), the country's largest academic database. We implemented a systematic search strategy consistent with our global approach, adapted to Chinese terminology while maintaining conceptual alignment. The CNKI subject field was queried sequentially with five key terms, namely higher education "高等教育", university "大学", undergraduate "本科生", postgraduate "研究生", and university faculty 高校教师. The search was restricted to journal articles published between 1992 and 2024, limited to the Peking University Core Journals to mirror the quality threshold of the WoS Core Collection, and filtered under the disciplinary category of higher education. After deduplication and data cleaning, the final combined corpus comprised 99,975 publications.

Including publications from the Chinese national database carries broader implications that extend well beyond the Chinese case itself. It highlights a key limitation of our report, as noted earlier. Although our aim is to map global knowledge production, the English language WoS dataset principally captures work written in or translated into English. In countries with strong national research communities and long-standing native language academic traditions, including Germany, France, and Japan, English language outputs represent only one portion of their scholarly production. The Chinese case therefore operates both as a necessary complement to this limitation and as an important reminder that any thorough mapping of global knowledge production must take publications in national languages into account. It also affirms that major strands of scholarly dialogue continue to take place outside the Anglophone academic sphere.

C2. ANALYTICAL METHODS

To support a precise and dynamic inquiry, our analysis brings together traditional bibliometric techniques and STM. Through this combined approach, we not only mapped the external contours of the field but also uncovered its internal semantic structure and the emerging frontiers of innovation within academic publications. We further applied cross national and regional comparisons to identify distinctive characteristics and forms of scholarly agency. It is important to clarify that our comparative approach does not follow a conventional like-with-like framework. Rather than seeking direct statistical equivalence across cases, our strategy operates through mutual referencing and cross contextual dialogue. Different cases function as points of comparison that help illuminate structural distinctions, developmental trajectories, and variations in paradigmatic orientation. This approach emphasises contextual specificity, relational dynamics, and differential patterns of knowledge production across diverse geographical and institutional settings. By doing so, it enables a more nuanced understanding of how higher education research unfolds within and across distinct scholarly ecosystems.

Bibliometric Analysis

A number of descriptive analyses were performed in this report to illustrate higher education across multi-scalar space.

Volume and Trends in Publication Output

Our analytical procedure began by benchmarking the cumulative scholarly output in higher education. We then conducted a stratified analysis to break down this overall body of work into temporal and spatial patterns. This involved examining its longitudinal evolution through time series segmentation, its geographical diffusion across national contexts, and its collaborative configurations among research groups.

Through this multi-dimensional analytical design, we were able to trace shifts in research output over time, identify the geographical settings that drive particular scholarly agendas, and show how collaborative networks influence the circulation of knowledge. This systematic decomposition not only charts the quantitative growth of the field but also reveals the structural dynamics and power relations that shape knowledge production in higher education research.

Scholar Profiles and Participation

Authors who contribute to knowledge production in the field are treated as agents who participate in the research space construction. In this report, we first examined the activeness of agents across different phases in order to identify the principal producers of the space and to understand their patterns of participation. Scholars who published at least five journal articles within any five year period between 1991 and 2024 were categorised as the Critical Mass, while those who did not were classified as the Hidden Mass.

While constructing this dataset, we encountered instances of multiple counting caused by

inconsistent spellings of authors' names across publications. Because the total number of scholars in the Critical Mass group is relatively small, at fewer than nine thousand, we undertook systematic manual cleaning to minimise potential deviations in the subsequent analysis. We compared given names associated with the same surnames and assessed whether variations were merely due to initials or partial spellings. We then checked whether these individuals shared institutional affiliations or appeared in different affiliations during the same years. Where such evidence suggested duplication, we merged the records and retained the full name as the standard reference.

We also identified cases where publication counts had been erroneously inflated because different individuals shared identical names, a situation most common among Chinese authors due to high name duplication rates and variation in transliteration practices. After separating these individuals, we recalculated their publication counts to determine whether they still met the criteria for active status.

Following data cleaning and the finalisation of the agent dataset, we coded the metadata to develop scholarly profiles for the authors. The coding framework included bibliographic identifiers, productivity indicators, career trajectories, geographical and institutional mobility, and disciplinary and collaborative characteristics. Using this coded dataset, we examined the publication trends of the Critical Mass over time and across regions, as well as their collaboration patterns.

The Hidden Mass comprises authors who do not meet the criteria for active status but nonetheless participate in the research space. Although issues of multiple counting due to name variation also occur in this group, the dataset contains nearly four hundred thousand authors, making manual cleaning unfeasible.

Knowledge Production Centres and Dissemination Venues

At the institutional level, we applied Named Entity Recognition (NER) techniques to systematically identify knowledge production centres from the affiliation information contained in each publication's metadata. This computational method allowed us to extract and standardise institution names from author address fields, which frequently include inconsistent formatting, abbreviations, and variations across publications. We then quantified the publication output of each institution across different temporal segments, enabling us to track the emergence, consolidation, and decline of universities as hubs of knowledge production over time. This analysis not only reveals which institutions dominate the field numerically but also highlights patterns of institutional concentration, the rise of new research powerhouses, and shifts in the geographical distribution of knowledge producing capacity within

higher education research.

We also identified major academic journals as the key venues for knowledge dissemination in higher education research. These journals form the material domain of the research landscape and reflect scholars' preferred channels for communicating findings. We defined key venues as journals that published at least one hundred papers within any consecutive five year period.

Disciplinary Breadth

To examine the disciplinary backgrounds of scholars contributing to higher education research, we used departmental affiliation information in the author metadata as a proxy. Drawing on this information, we developed a classification scheme comprising thirteen broad disciplinary domains, namely Education, Medicine, Literature, Engineering, Science, Law, Management, History, Art, Economics, Philosophy, Agriculture, and Military Studies.

This categorisation allows us to assess the degree to which higher education research remains anchored in Schools of Education and the extent to which it has diffused into a wider set of disciplinary communities. In doing so, it offers insight into the field's evolving intellectual boundaries and its interdisciplinary dynamics over time.

Research Collaboration Patterns

To examine the knowledge production mode in higher education research, we analysed collaboration patterns at multiple scales through co-authorship network analysis. This dimension captures how scholars organise their intellectual labor, build research alliances, and navigate geographical boundaries in creating knowledge.

We operationalised collaboration using several indicators extracted from author metadata. First, we identified the authorship structure of each publication, distinguishing between single authored and co-authored works to assess the relative prevalence of individual and collaborative research practices. For co-authored publications, we examined their geographical characteristics to determine whether collaboration took place within the same country or within the same region. Cross regional collaborations were further classified into North-South, South-South, and North-North partnerships based on the geographical categories established in our regional analysis. This allowed us to trace both asymmetries and solidarities within global knowledge networks.

Structural Topic Modelling Analysis

A distinctive feature of this report is the application of STM to uncover the thematic architecture of higher education research. Traditional bibliometric techniques, including keyword co-occurrence analysis and thematic reviews based on author assigned keywords, have limited capacity to reveal deeper semantic structures. Keyword based methods operate at the level of individual terms and cannot fully capture the latent intellectual paradigms, methodological orientations, or theoretical frameworks embedded within scholarly discourse.

STM addresses these limitations by probabilistically modelling both document topic and topic word distributions, thereby algorithmically identifying coherent thematic structures within large text corpora (Blei et al., 2003; Roberts et al., 2019). Unlike keyword based approaches, which rely on surface level frequency counts and researcher predefined terms, STM facilitates the discovery of emergent or previously overlooked sub-fields. It also enables the tracking of thematic evolution over time and links topics to document level metadata such as geographical location or temporal trends (Saxton, 2018).

This method has been increasingly adopted in higher education research as a means of processing large scale textual datasets and mapping the broader landscape of knowledge production (e.g., Daenekindt & Huisman, 2020; Gao et al., 2024, 2025; Munoz-Najar Galvez et al., 2020).

STM Analysis of the Global Dataset

In this report, we applied STM to the global dataset consisting of 213,492 publications. Paper abstracts were extracted to form the corpus for analysis. The methodological pipeline began with extensive data pre-processing. The raw text was cleaned, converted to lower case, and stripped of punctuation and stop words, followed by lemmatisation to normalise tokens and the extraction of n-gram terms.

Given the scale of the dataset, we estimated a series of candidate models with topic numbers (K) ranging from thirty to seventy. Model selection was guided by several diagnostic metrics, namely residual dispersion, heldout likelihood, and the lbound. Residual dispersion measures sample dispersion from the model and tests whether this dispersion significantly exceeds one (Taddy, 2011). Heldout likelihood assesses predictive capacity by withholding a proportion of words and estimating the likelihood of the held out portion using document level latent variables. The lbound incorporates the maximum lower bound for each topic number and applies a correction factor to penalise overly complex models and reduce the risk of overfitting.

On the basis of these diagnostics, we narrowed the optimal range to models with fifty to sixty topics. The final determination, however, relied on iterative qualitative evaluation. We examined the top twenty terms for each candidate model using both probability and FREX metrics and reviewed the titles of the ten highest loading documents for selected topics. A *K*=55 model was ultimately selected because it offered the most suitable balance between thematic coherence, parsimony, and analytical depth.

We then employed a systematic approach to label

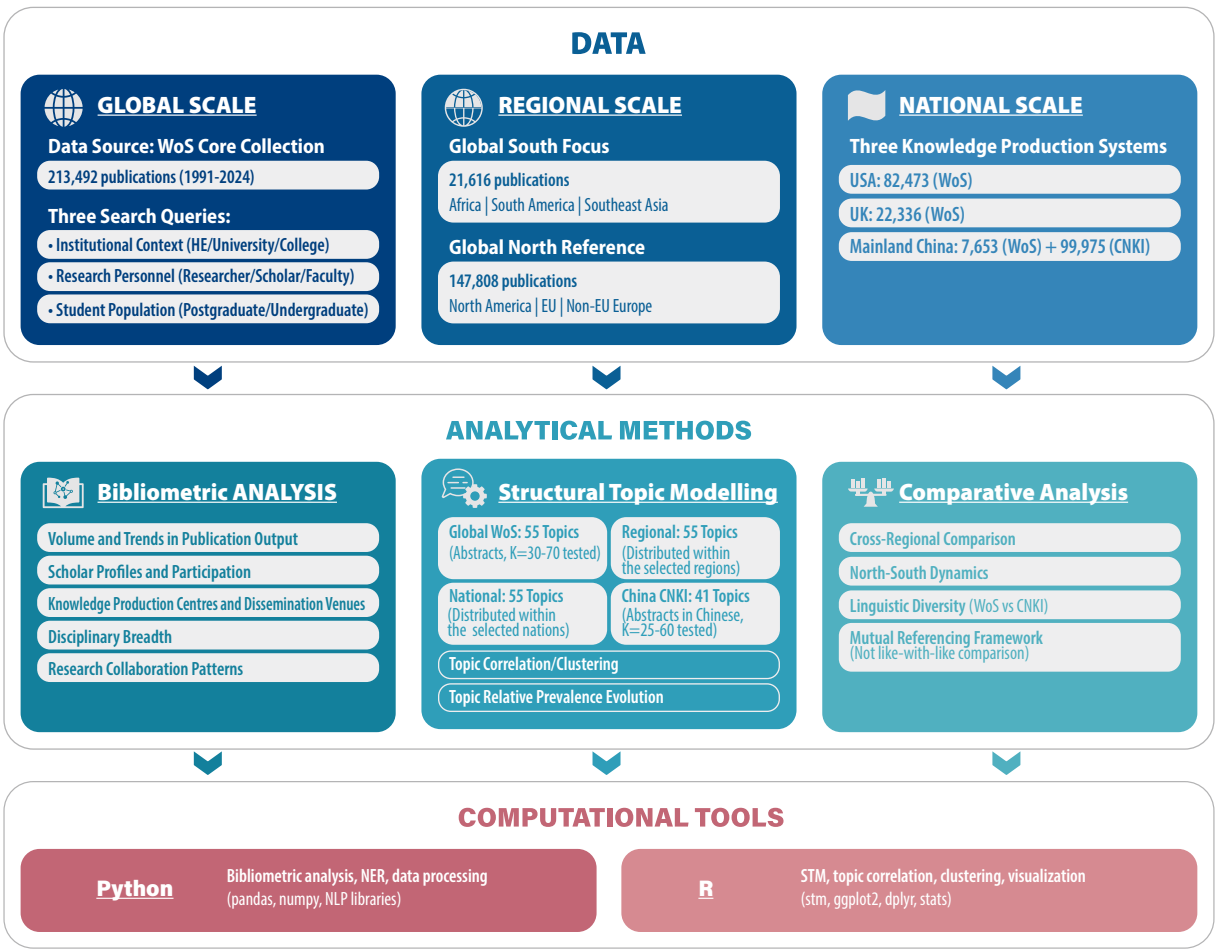


Figure C1. Data and Methodological Roadmap

the 55 topics. Initial labels were assigned through analysis of high probability and FREX terms and were further validated by reviewing the titles of the twenty highest-loading articles for each topic. This multi-step procedure ensured that the labelled topics aligned closely with the core themes present in global higher education research.

After establishing the 55- topic model for the global dataset, we carried out a series of analyses to explore topic relationships and their temporal dynamics. We calculated MAP (maximum a posteriori probability) correlation coefficients for topic proportions to examine marginal correlations within the variational distribution. We used hierarchical clustering with Ward's method to group similar topics into clusters. Finally, we applied linear plots to examine the evolution of topics over time, with topic weights calculated from the Theta matrix generated by the model.

Regional and National Topic Distribution Based on the Global Model

After establishing the 55-topic model for the global dataset, we examined how these topics were distributed across different regional and national cases. For the regional analysis, we extracted all publications belonging to each region, including Africa, Latin America, Southeast Asia, the Global South, and the Global North, from the global corpus. Each publication in the global model had an assigned topic composition, expressed as a probability distribution across the 55 topics. To calculate the topic distribution for a given region, we aggregated the topic proportions of all publications affiliated with that region, weighting each publication equally, and then standardised the resulting distribution so that the sum of all topic proportions equalled one. This procedure captures the thematic emphasis of each region by synthesising the topic compositions of its constituent publications.

The same procedure was applied at the national scale for the United States, the United Kingdom, and Mainland China. Publications were filtered by the institutional affiliation of their authors, their topic compositions were aggregated and reweighted, and the resulting distributions were standardised. This allowed us to compare how the 55 global topics manifested differently across national contexts and to identify distinctive thematic priorities.

We also examined the temporal evolution of these topic distributions within each region and country. By tracking changes in topic weights over time, we identified shifts in research agendas and emerging thematic trends across the different geographical settings.

STM Analysis of the CNKI Dataset

For the case of Mainland China, we conducted a separate STM analysis on the CNKI dataset of 99,975 publications. Following the same pre-processing and modelling pipeline used for the global model analysis, we estimated candidate models ranging from twenty five to sixty topics. Diagnostic metrics narrowed the optimal range to models with forty to forty five topics. Through iterative qualitative evaluation, we selected a 41-topic model as the most semantically coherent representation of Chinese higher education research. We labelled the 41 CNKI topics using the same systematic procedure applied in the global model. We then conducted correlation analysis, hierarchical clustering, and temporal evolution tracking for the CNKI topics.

The STM analysis result of the CNKI dataset allowed us to compare thematic structures across Anglophone and Chinese scholarly contexts. In doing so, it revealed points of convergence and divergence in intellectual priorities across linguistic and cultural settings.

C3. SOFTWARE AND COMPUTATIONAL TOOLS

All analyses in this report were conducted using a combination of statistical and computational software. Bibliometric analyses, including publication trends, author profiling, institutional identification via NER, disciplinary breadth, and collaboration pattern analysis, were performed primarily using Python, leveraging libraries such as pandas, numpy, and specialised NLP tools for text processing and entity extraction.

STM was conducted in R using the stm package (Roberts et al., 2019). Subsequent analyses, including topic correlation assessment, hierarchical clustering, temporal evolution plots, and the calculation of topic weights from the Theta matrix, were also implemented in R with packages such as ggplot2, dplyr, and stats for visualisation and statistical computation.

This combined use of Python for large scale data processing and R for specialised topic modelling provided both computational efficiency and methodological rigor across the entire analytical pipeline.

Part

D

The Global Landscape of Higher Education Knowledge Production

D1. VOLUME AND TRENDS IN PUBLICATION OUTPUT

The volume of research on higher education at the global level has shown consistent growth, beginning at a relatively modest pace and accelerating notably from the mid-2000s onwards. Over the 34-year period of our record, a total of 213,492 journal articles on higher education were published. It should also be noted that, as higher education research forms part of the broader social sciences, many countries where English is not the official language may conduct and publish research in their native languages. Such outputs are often not indexed in global databases, including the one employed in this report, and therefore may not be fully represented in our analysis.

As shown in Figure D1, the number of annual publications increased from 297 in 1991 to 21,597 in 2024. Between 2004 and 2005, the yearly output almost doubled. This sustained expansion in global knowledge production suggests that a global research space in higher education has taken shape since around 2005, somewhat later than the global science system, which began to emerge during the 1990s. Accordingly, we divided the global knowledge production in higher education into three distinct phases for a closer examination of its developmental trajectories: Phase I from 1991 to 2004, Phase II from 2005 to 2014, and phase III from 2015 to 2024.

Beyond the overall increase in publication volume, the emergence of a global research space in higher education is also reflected in the growing diversity of participating countries. During the first phase, prior to 2005, the dataset captured 96 countries that participated in global knowledge production, with only ten of them publishing more than 100 papers each. In the second phase, this number expanded to 159 countries, including 48 with over 100 publications. By 2024, a total of 192 nations around the world had joined the global research community, each making distinctive contributions to the study of higher education. This broadening in both scale and diversity demonstrates the field's significant growth and consolidation on a global level.

Figure D2 presents the global distribution of higher education publications by country and phase[2]. The spatial pattern of knowledge production reveals pronounced disparities between the Global North and the Global South. The United States stands as the dominant contributor to higher education research, accounting for more than one third of the world's journal articles in this field. In contrast, the visibility of the Global South within the global research landscape remains comparatively limited. Among the top ten countries producing the largest number of higher education papers (see Table D1), only mainland China , Taiwan ,China and South Africa

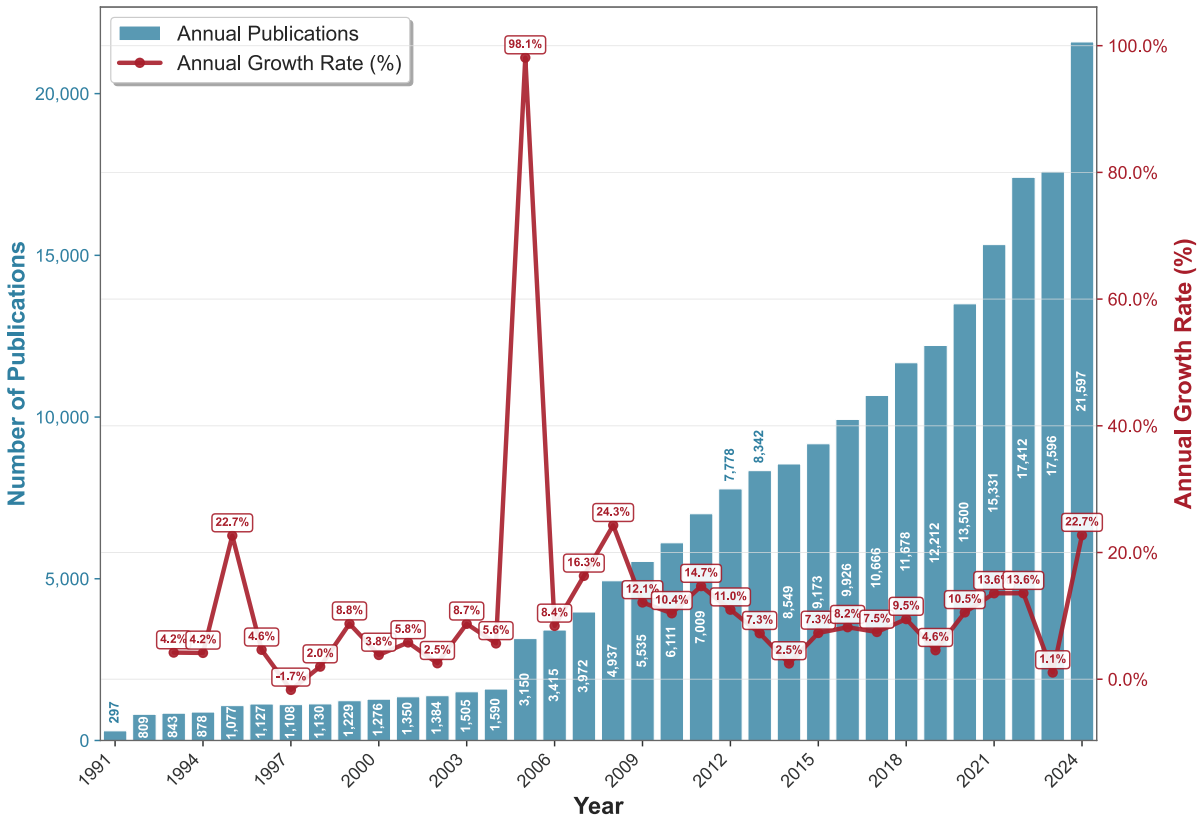
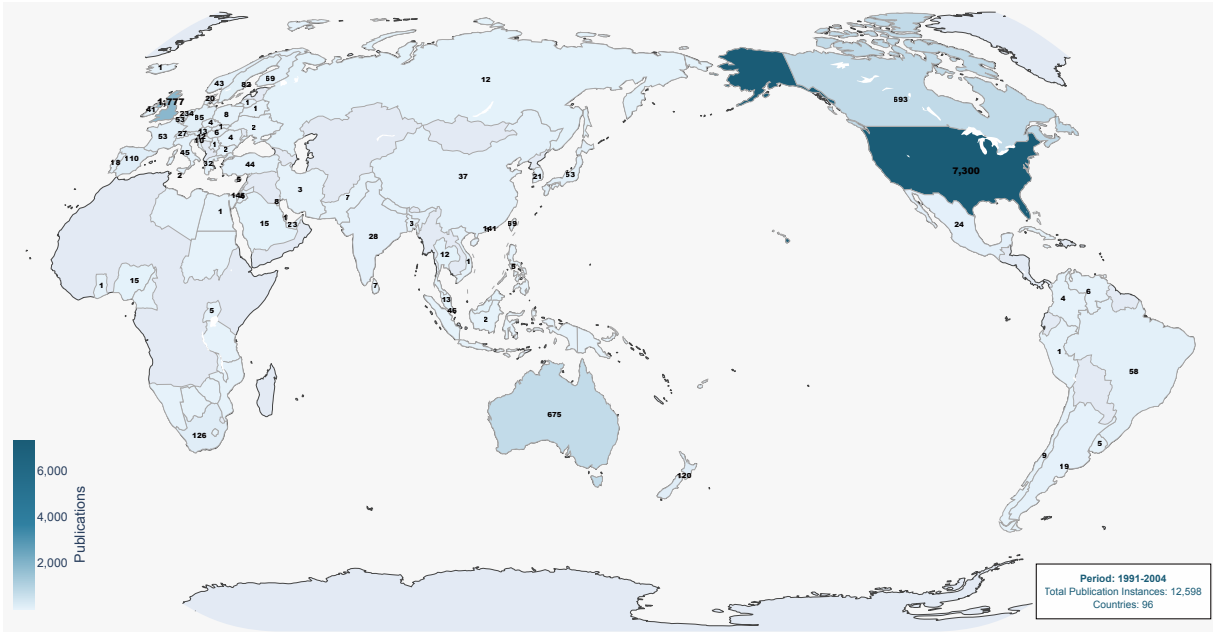


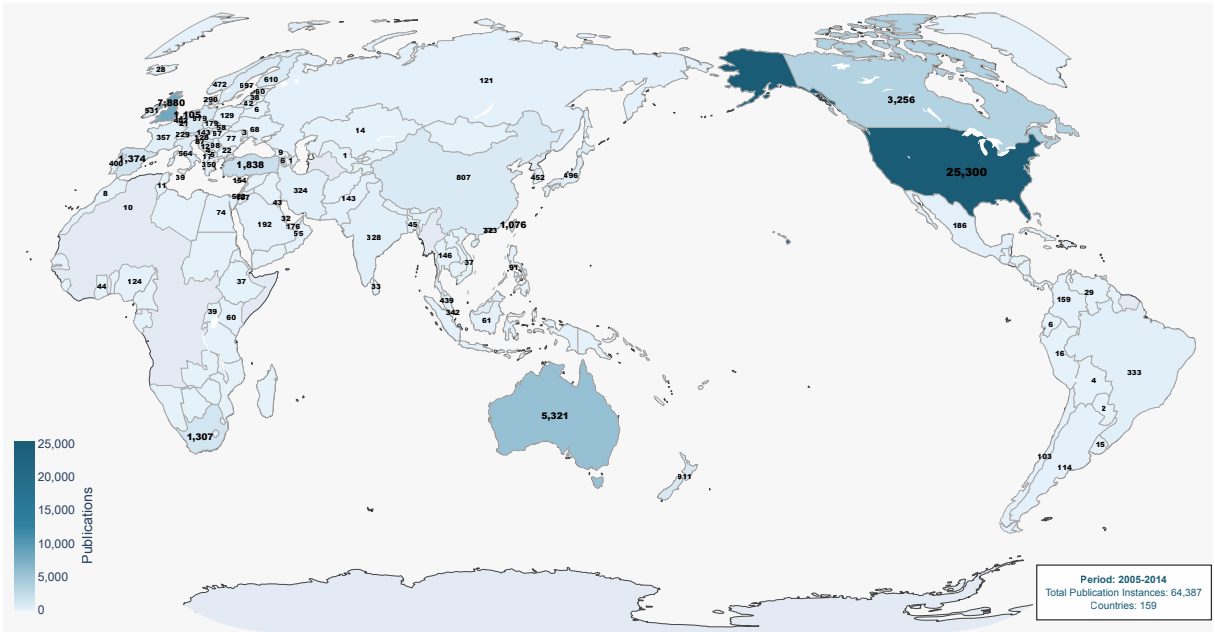
Figure D1. Global Higher Education Publication Output and Annual Growth Rate (1991-2024)

belong to the Global South. Nevertheless, several emerging knowledge centres, including Brazil and India, have demonstrated notable growth in their academic output.

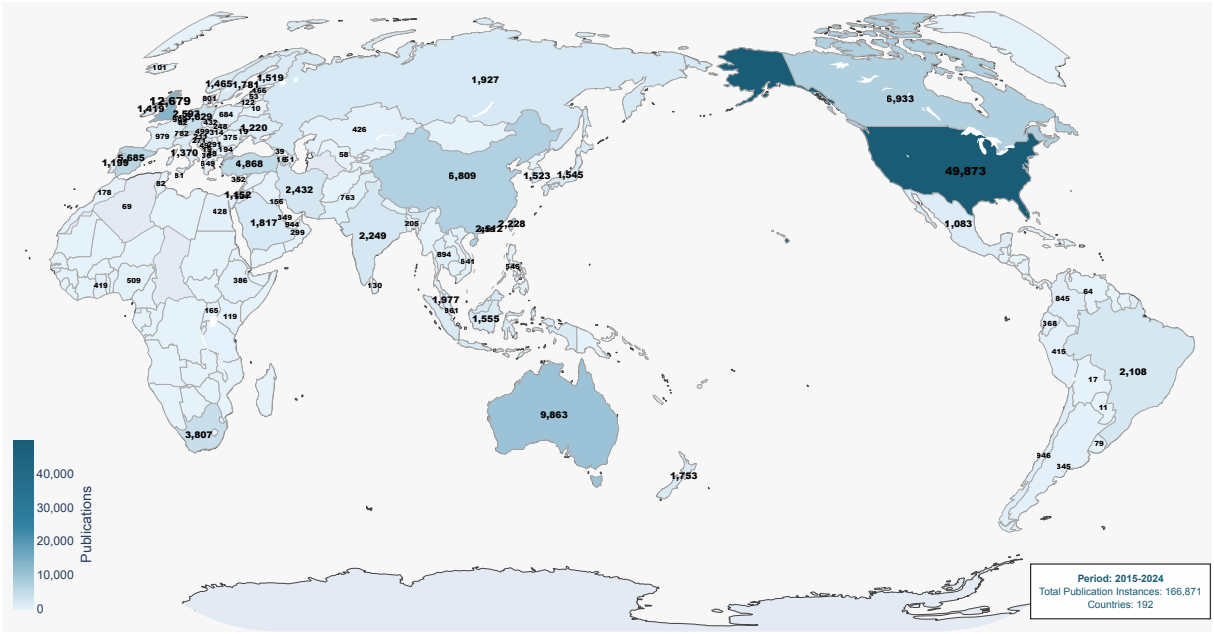
[2] Of the total 213,492 papers, 208,631 (or 97.7%) contained address information that enabled the identification of authors' countries of affiliation, which served as the basis for analysing the spatial distribution of global research output.



Phase I (1991-2004)



Phase II (2005-2014)



Phase III (2015-2024)

Figure D2. Global Higher Education Publication Output: Geographical Distribution by Phase

Table D1. Leading Ten Countries/Regions in Higher Education Research Publications and Global Share (1991 - 2024)

Countries/Regions	Total Publication Number	Global Share
USA	82,473	39.53%
UK	22,336	10.71%
Australia	15,859	7.60%
Canada	10,882	5.22%
Mainland China	7,653	3.67%
Turkey	5,552	2.66%
Spain	7,169	3.44%
South Africa	5,240	2.51%
Germany	4,593	2.20%
Taiwan, China	3,373	1.62%

In Part E we turn the focus to the regional scale, offering a closer examination of Global South's contribution and research agendas in the field of higher education. Part F provides a national comparative analysis of three distinct cases— the United States, the United Kingdom, and mainland China. The first two exemplify long-established leadership in higher education studies, each underpinned by distinctive paradigms and intellectual traditions. Mainland China, as a major emerging knowledge producer with a substantial national research community, provides valuable insight into the multi-scalar nature of contemporary knowledge production.

D2. RESEARCHER PROFILES AND PARTICIPATION

The 213,492 papers in our dataset were authored by 407,716 scholars. A closer examination of this cohort enables the identification of the active agents in the global higher education research space, referring to those scholars who form the *critical mass* that sustains this academic field. In this report, active agents are operationally defined as authors who have published at least five articles within any rolling five-year period between 1991 and 2024. Those who do not meet this criterion are categorised as the *hidden mass*.

This threshold balances inclusivity and influence. It is sufficiently low to avoid focusing only on elite scholars, yet high enough to capture those who have demonstrated consistent engagement in higher education research. Based on this rule, the entire author pool was divided into two groups, producing separate datasets for the critical mass and the hidden mass. Within our data, the critical mass comprised 8,319 individuals, representing 2.04 per cent of all authors, while the hidden mass consisted of 399,397 authors, or 97.96 per cent of the total. Although the critical mass accounts for only 2 per cent of all contributors, these scholars involved in the production of over one third of the world's publications in higher education.

This pronounced imbalance reflects the structural characteristics of knowledge production within the field. A relatively small yet cohesive group of scholars shapes the intellectual core of higher education research by establishing its norms, defining paradigms, and setting research agendas. At the same time, the growth and diversification of the field have benefited greatly from a larger and more dispersed group of contributors, many of whom originate from other disciplines. For these scholars, higher education may not constitute their primary research focus but serves as an area of application or intersection with their main field of study.

Figure D3 illustrates the growth in publications produced exclusively by the critical mass, exclusively by the hidden mass, and through collaborations between the two groups. The total number of publications per year has increased continuously and substantially. Throughout this expansion, the hidden mass have remained the principal contributors to overall output, although their share has declined over the past three decades. In 1991, papers authored solely by the hidden mass accounted for more than 90 per cent of all higher education research publications, but this proportion fell steadily through the early 2000s.

By contrast, papers authored solely by the critical mass have consistently represented a small

proportion of the total. Their share began at less than one per cent in 1991, rose gradually to a modest peak of about seven per cent in the mid-2010s, and then declined again to below five per cent by 2024. The most significant structural change, however, lies in the growing collaboration between critical and hidden mass authors. In 1991, CM–HM collaborations accounted for only about six per cent of all publications, and throughout the 1990s this figure remained below ten per cent. From the early 2000s onwards, this segment expanded steadily, reaching roughly 15 per cent of annual output by 2005. The upward trend continued over the next decade, with collaborative publications comprising about one quarter of all higher education research papers by 2020.

The coexistence of both the critical and hidden masses demonstrates that higher education has developed into a mature research field with clearly defined agendas, theoretical frameworks, and methodological norms, as well as a community of scholars who primarily identify with it. Nevertheless, knowledge production in this domain continues to be characterised by a high degree of interdisciplinarity, drawing insights and methods from a broad range of academic traditions.

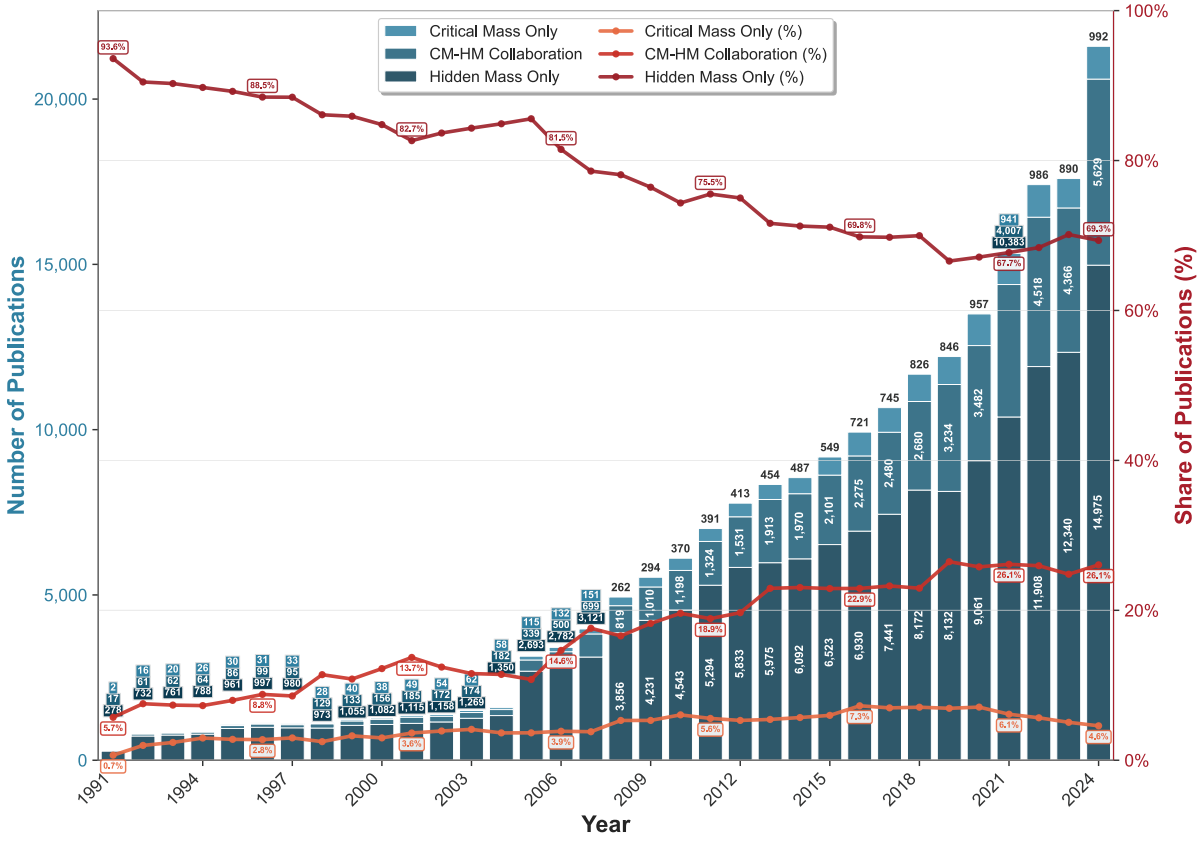


Figure D3. Annual Publications and Growth Rates by Agent Type: Critical Mass, Hidden Mass, and Their Collaborations

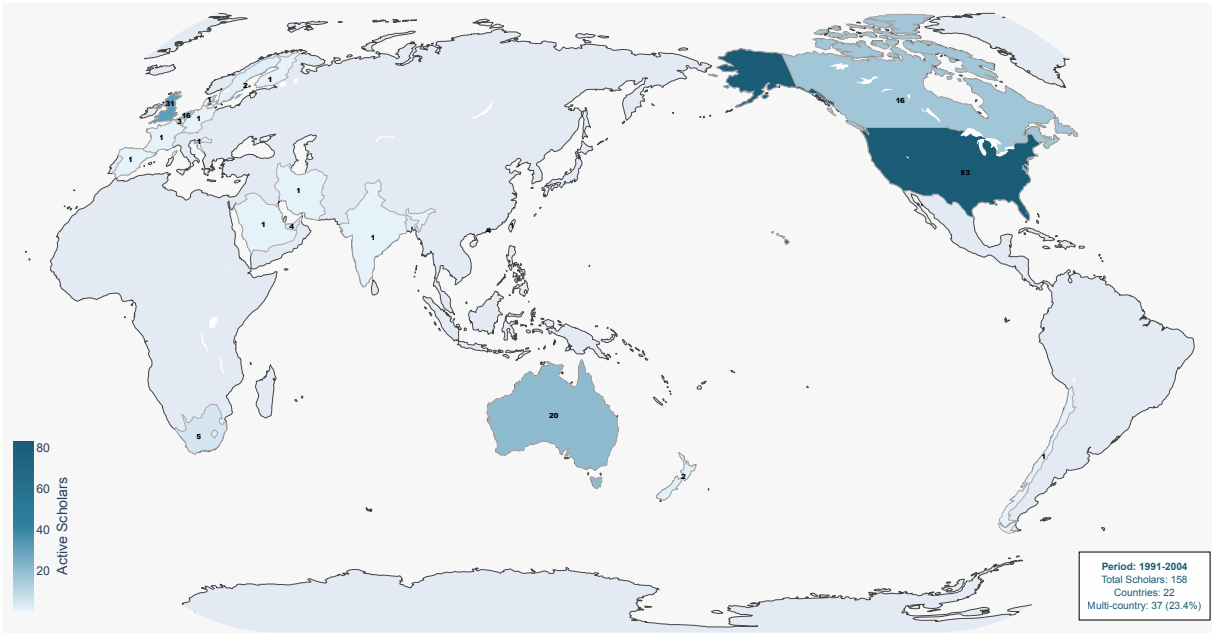
The Critical Mass

According to Keim (2008), *critical mass* refers to the concentration of scholars and institutions required to maintain an autonomous academic community. It represents an essential threshold in the development and endurance of academic disciplines, marking the point at which a field achieves sufficient size, diversity, and institutional infrastructure to support internal dialogue, methodological innovation, and intellectual independence. In this sense, critical mass is both a structural and epistemic condition for disciplinary autonomy, as it enables scholars to develop and refine ideas within their own research frameworks rather than depend on external paradigms.

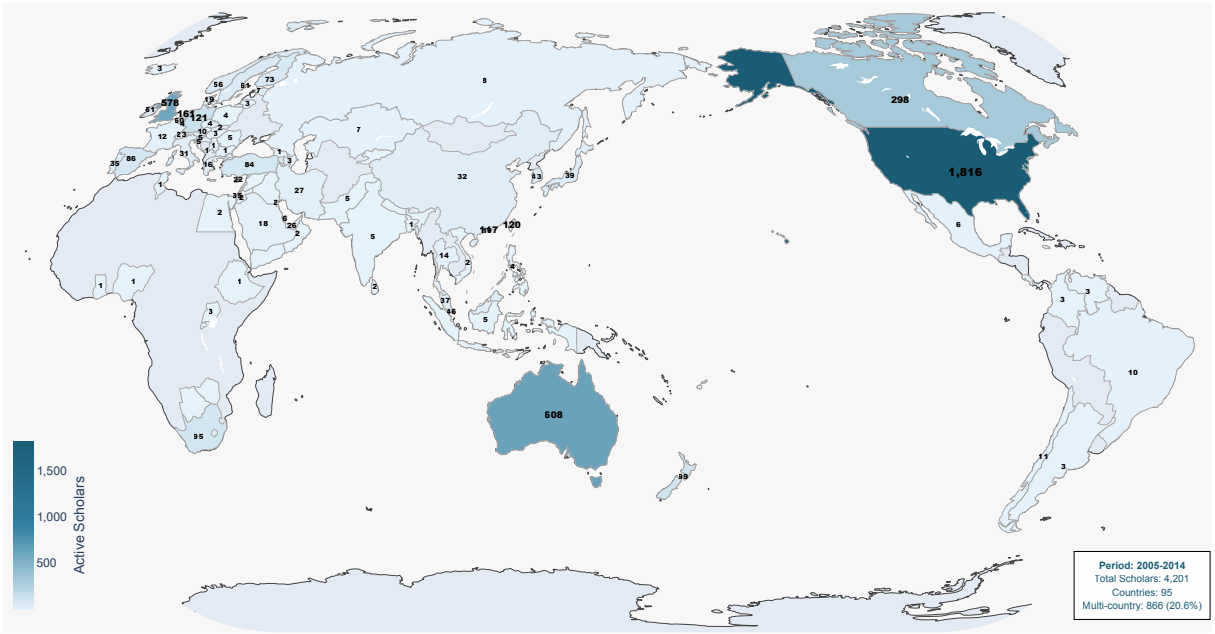
The absence of critical mass, by contrast, limits disciplinary differentiation and reduces international visibility (Boncourt et al , 2022; Jung, 2018). Jung (2018) emphasises that a field reaches maturity when its scholarly community grows large and diverse enough to sustain dedicated journals, professional associations, and research programmes. In this process, critical mass transforms dispersed scholarly activity into a coherent research domain. Similarly, Boncourt et al (2022) highlight the role of critical mass in shaping the internal differentiation and intellectual structure of established disciplines. Collectively, these perspectives demonstrate that critical mass is both a quantitative and qualitative threshold in field knowledge production. It marks the moment when a field becomes self-generating, capable of producing its own concepts, reproducing its research community, and setting independent intellectual agendas.

Among the 8,319 active scholars, 6,654 were active for only one five-year period, while 1,208 and 367 maintained their activeness across two and three periods respectively. Sixty-five scholars remained active for four periods, seventeen for five periods, and only eight sustained their active contribution to knowledge production across six periods. These individuals exemplify a remarkable and enduring commitment to the field of higher education research.

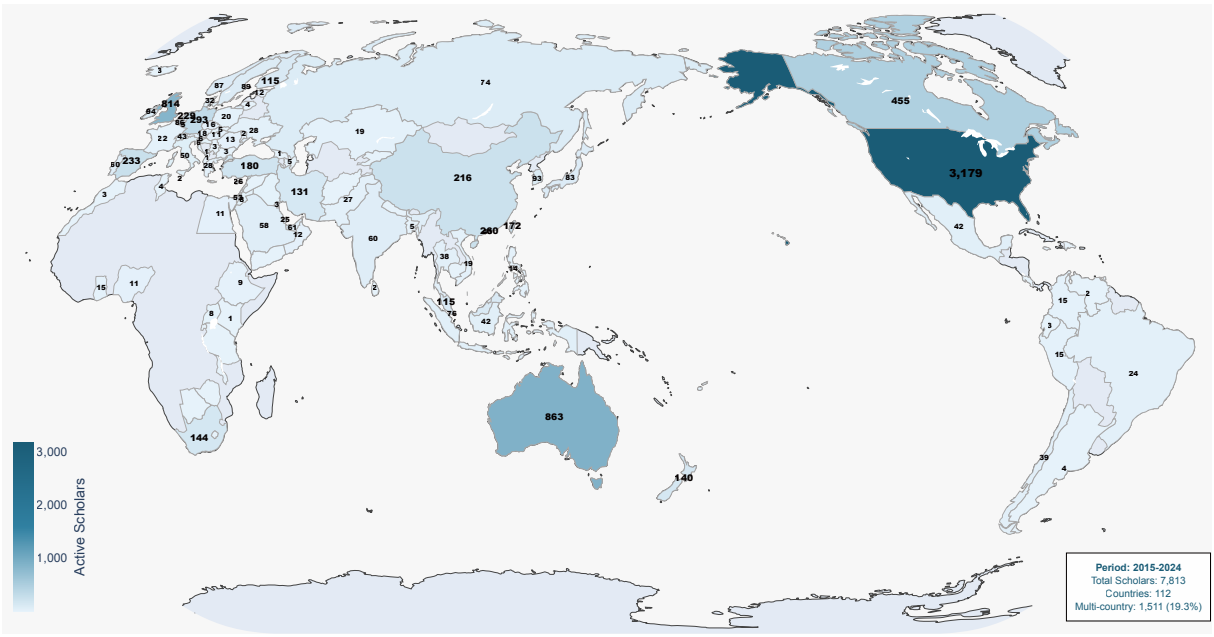
Of the 8,319 active scholars, 8,025 have address information available that allows their country affiliation to be identified. During phase I, only 158 active scholars from 22 countries were identified, as illustrated in Figure D4. The majority of these countries were English-speaking, such as the United States, the United Kingdom, Australia, Canada, the United Arab Emirates, New Zealand, and South Africa. In phase II both the number of active scholars and the range of their countries of origin expanded significantly. A total of 4,201 active scholars were identified from 95 countries, many of which are emerging economies and non-English-speaking nations. This finding further supports our argument that a global higher education research space has taken shape since 2005, characterised by expansion in both scale and diversity. In the phase III, this group expanded further to 7,813 researchers from 112 countries.



Phase 1 (1991-2004)



Phase 2 (2005-2014)



Phase 3 (2015-2024)

Figure D4. Number of Active Scholars: Geographical Distribution by Phase

This trend reflects the continued growth of the global higher education research space, which has evolved into an increasingly open and inclusive structure that provides broader opportunities for knowledge production. Emerging economies in Asia, including mainland China, India, Pakistan, and Indonesia, as well as Latin American countries such as Mexico and Peru, though still limited in the number of active researchers, display a strong upward trajectory. Similar patterns are evident in African nations such as Ghana and Nigeria, suggesting their growing participation in the global research community and the ongoing internationalisation of their higher education systems.

Certain pivotal but unforeseen events may also have acted as catalysts for scholars to engage more visibly in the global space. Notably, both Russia and Ukraine experienced marked increases in the number of active researchers, with Ukraine showing particularly striking growth, as no active researchers were identified there in phase II but 28 appeared in phase III. In contrast, countries such as Japan and France exhibited a comparatively slow increase in the number of active researchers, which may reflect either a conservative research culture within higher education studies or the presence of strong national research communities that primarily publish in domestic outlets.

The Hidden Mass

In contrast to the small yet cohesive group of core contributors to higher education knowledge production, our data also reveal a large, loosely connected, and dispersed group of researchers who engage with the field only sporadically. The existence of this substantial hidden mass highlights the interdisciplinary nature of higher education research. The field has long drawn upon intellectual traditions from sociology, political science, psychology, history, economics, anthropology, and cultural studies. It shares thematic concerns with these disciplines, including sociological investigations of inequality, psychological analyses of behaviour, cultural examinations of identity, and policy-focused studies rooted in public administration.

This group constitutes 97.96 per cent of all identified authors and is responsible for producing

approximately two thirds of all publications in the dataset. Nearly four fifths of hidden mass authors have published only a single paper. Typically, hidden mass author's activity within the field is captured only within one year. At the upper end of the distribution, the most productive individuals have published up to 12 papers, while fewer than one in ten have produced three or more. Those who have authored more than one publication tend to do so irregularly. The longest recorded engagement with higher education research among this group spans 32 years, a duration comparable to the longest career observed within the critical mass. However, such contributions are spread thinly across time and lack the continuity that characterises sustained participation in the field.

It is reasonable to infer that many researchers within the hidden mass have established their academic careers in other disciplinary domains that intersect with higher education studies. Drawing on their affiliation information, we applied a NER technique to extract school or faculty-level descriptors, which serve as a proxy for identifying their disciplinary backgrounds[3]. As shown in Figure D5, approximately one fifth of these researchers are affiliated with faculties of medicine, reflecting the significance of tertiary medical education as a branch of higher education research. The results of our STM analysis, presented in Section D5, further confirm that several substantial topics within the field are related to medical education at the tertiary level. Researchers from the sciences also make notable contributions to higher education studies. Science-related topics tend to be both sizeable and consistently popular within the field. Scholars affiliated with broader areas of education likewise constitute an important proportion of the hidden mass. Although their primary research focus may lie in primary, secondary, or vocational education, their work often overlaps with higher education, leading to the inclusion of their publications in our dataset. Given the growing significance of tertiary engineering education, the proportion of researchers with an engineering background engaging in higher education studies has continued to increase, rising from 5.6 per cent in phase I to 8.6 per cent in phase III. The identification of the hidden mass group supports the argument that knowledge production in higher education has increasingly aligned with Mode 2, characterised by transdisciplinarity, problem orientation, and strong embeddedness in real-world application contexts.

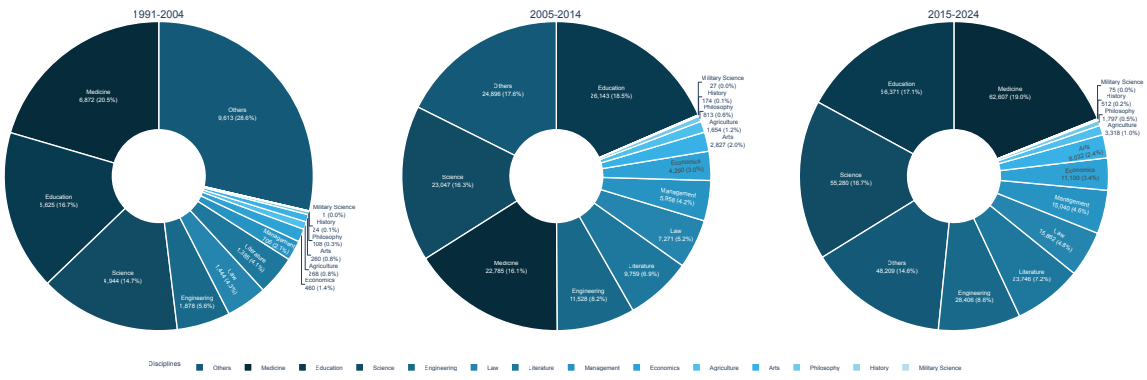


Figure D5. Disciplinary Backgrounds of Hidden Mass by Phase

[3] We extracted each author's school or faculty-level affiliation information and categorised their broad academic field according to the classification of thirteen major disciplines defined by the Chinese Ministry of Education (MoE, 2018).

D3.
CENTRES OF KNOWLEDGE PRODUCTION AND DISSEMINATION VENUES

As Larsen and Beech (2014) observe, 'the global is not just some space out there, without material basis. It is produced in local settings' (p. 200). Marginson's (2022a) glonacal framework further develops this argument by emphasising that the material domain of space consists of pre-existing structures such as communication networks, inherited institutions, infrastructures, languages of use, laws, policies, and the full apparatus of economic resources, including sunk investments and ongoing funding. These material foundations are shaped and constrained by policies, priorities, hierarchies, and, most decisively, by budgets.

Within this framework, local material resources form the basis of agency. They enable the accumulation of capital, the generation of new ideas, the formation of collective activities, and the development of endogenous social practices. National agency is therefore grounded and strengthened through local conditions, creating opportunities for the pursuit of more autonomous global strategies.

Spatial imagination within the ideological domain is influenced by material realities but not entirely determined by them. In the domain of social practice, agents connect their interpretations, which originate in the ideological domain, to the resources of the material domain in order to construct activities, programmes, and organisations. These processes also encompass social relations both within and beyond higher education. As Massey (2005, p. 9) reminds us, manifestations of spatiality are 'necessarily embedded in material practices which have to be carried out'.

In this report, we examine the material domain of the global higher education research space from two perspectives: the centres of knowledge production at the institutional level worldwide, and the venues through which this knowledge is disseminated. For the first aspect, we extracted university information from all authors' affiliations and calculated the frequency of occurrence to identify the main centres of research activity. For the second, we analysed the journal information associated with all publications in the dataset to identify the principal venues through which knowledge in the field is circulated.

Leading Knowledge Production Centres in Higher Education Research

In addition to identifying the leading countries in the production of higher education research, the institutional-level data provide deeper insight into the concentration of research infrastructure and epistemic traditions at the meso level. In the first phase, 1,239 universities were engaged in higher education knowledge production. This number increased to 2,794 in the second phase and further expanded to 5,133 in the third phase. Table D2 presents the top 50 universities that published the largest number of higher education papers worldwide in each phase.

Table D2. Leading 50 Institutional Knowledge Production Centres in Higher Education Research by Phase

P1 (1991-2004)		P2 (2005-2014)		P3 (2015-2024)	
Top 50 Universities (Country)	Number of published papers	Top 50 Universities (Country)	Number of published papers	Top 50 Universities (Country)	Number of published papers
University of Michigan (USA)	170	University of London (UK)	651	University of Toronto (Canada)	1,513
University of London (UK)	157	University of Toronto (Canada)	619	Monash University (Australia)	1,339
University of Toronto (Canada)	144	Monash University (Australia)	537	Harvard University (USA)	1,237
Harvard University (USA)	141	University of Sydney (Australia)	504	University of Michigan (USA)	1,188
University of Georgia (USA)	140	Purdue University (USA)	492	Michigan State University (USA)	1,128
University of Maryland College Park (USA)	124	University College London (UK)	464	University College London (UK)	1,078
University of California Los Angeles (USA)	122	University of Michigan (USA)	457	University of British Columbia (Canada)	980
University of Wisconsin Madison (USA)	121	University of British Columbia (Canada)	424	Purdue University (USA)	976
Maastricht University (Netherlands)	120	University of Minnesota Twin Cities (USA)	421	Ohio State University (USA)	954
Michigan State University (USA)	116	Michigan State University (USA)	417	University of London (UK)	944
University of Minnesota Twin Cities (USA)	114	University of Queensland (Australia)	411	Deakin University (Australia)	907
University College London (UK)	111	University of Wisconsin Madison (USA)	402	University of Sydney (Australia)	881

P1 (1991-2004)		P2 (2005-2014)		P3 (2015-2024)	
Top 50 Universities (Country)	Number of published papers	Top 50 Universities (Country)	Number of published papers	Top 50 Universities (Country)	Number of published papers
University of Iowa (USA)	110	Maastricht University (Netherlands)	396	University of Wisconsin Madison (USA)	876
University of Illinois Chicago (USA)	104	University of Georgia (USA)	372	University of Minnesota Twin Cities (USA)	855
University of North Carolina Chapel Hill (USA)	103	Harvard University (USA)	358	University of Melbourne (Australia)	852
Ohio State University (USA)	102	Indiana University Bloomington (USA)	356	University of Queensland (Australia)	849
University of Washington Seattle (USA)	99	University of California Los Angeles (USA)	339	Maastricht University (Netherlands)	830
Indiana University Bloomington (USA)	93	Griffith University (Australia)	335	University of Georgia (USA)	811
University of Missouri Columbia (USA)	91	Queensland University of Technology (Australia)	329	Indiana University Bloomington (USA)	785
University of Kentucky (USA)	87	University of Melbourne (Australia)	325	University of Texas Austin (USA)	771
Purdue University (USA)	86	Ohio State University (USA)	322	McGill University (Canada)	719
University of Pittsburgh (USA)	81	University of Oxford (UK)	317	Stanford University (USA)	701
University of Illinois Urbana-Champaign (USA)	80	University of North Carolina (USA)	315	University of Florida (USA)	676
Penn State Behrend (USA)	79	University of South Australia (Australia)	304	University of Calgary (Canada)	659
Monash University (Australia)	78	University of Texas Austin (USA)	304	Pennsylvania State University (USA)	653
University of Sydney (Australia)	78	Columbia University (USA)	298	University of Edinburgh (UK)	639
Pennsylvania State University (USA)	77	Vanderbilt University (USA)	296	University of California Los Angeles (USA)	631
Stanford University (USA)	76	University of Manchester (UK)	294	Beijing Normal University (China)	620
University of Texas Austin (USA)	76	University of Nottingham (UK)	290	University of Pennsylvania (USA)	618
University of Florida (USA)	75	McGill University (Canada)	289	University of Oxford (UK)	617
University of British Columbia (Canada)	73	University of Maryland College Park (USA)	283	University of Illinois Urbana-Champaign (USA)	617

P1 (1991-2004)		P2 (2005-2014)		P3 (2015-2024)	
Top 50 Universities (Country)	Number of published papers	Top 50 Universities (Country)	Number of published papers	Top 50 Universities (Country)	Number of published papers
Texas A&M University College Station (USA)	73	Texas A&M University College Station (USA)	273	University of North Carolina Chapel Hill (USA)	610
Vanderbilt University (USA)	72	University of Edinburgh (UK)	269	University of Ottawa (Canada)	609
Pennsylvania State University - University Park (USA)	70	University of Florida (USA)	269	University of Pittsburgh (USA)	603
University of Pennsylvania (USA)	69	Iowa State University (USA)	264	Arizona State University-Tempe (USA)	597
King's College London (UK)	68	University of Alberta (Canada)	264	University of Alberta (Canada)	591
University of Arizona (USA)	68	University of South Florida (USA)	263	Griffith University (Australia)	577
University of Dundee (UK)	68	University of Cambridge (UK)	259	Utrecht University (Netherlands)	577
University of North Carolina (USA)	66	Florida State University (USA)	259	Columbia University (USA)	573
University of New Mexico (USA)	66	University of Pittsburgh (USA)	256	Curtin University (Australia)	573
University of California San Francisco (USA)	65	University of Calgary (Canada)	255	Texas A&M University College Station (USA)	570
University of Sheffield (UK)	65	University of Illinois Urbana-Champaign (USA)	253	University of South Florida (USA)	568
Iowa State University (USA)	64	University of North Carolina Chapel Hill (USA)	248	Vanderbilt University (USA)	556
Southern Illinois University (USA)	63	University of Arizona (USA)	247	Johns Hopkins University (USA)	549
University of Manchester (UK)	61	Stanford University (USA)	246	University of Arizona (USA)	545
University of Southern California (USA)	61	University of Missouri Columbia (USA)	245	Pennsylvania State University - University Park (USA)	535
University of Nebraska Lincoln (USA)	60	University of Birmingham (UK)	245	McMaster University (Canada)	535
Cornell University (USA)	60	Deakin University (Australia)	241	University of South Africa (South Africa)	532
Columbia University (USA)	59	Curtin University (Australia)	236	University of Technology Sydney (Australia)	528
University of Leeds (UK)	58	University of Pennsylvania (USA)	232	Queensland University of Technology (Australia)	528

During the first phase, 38 of these universities were located in the United States, followed by seven in the United Kingdom and two each in Canada and Australia. By the second phase, the pattern had changed significantly. Although the United States continued to host the largest number of higher education research centres, its share declined to 26 universities. Meanwhile, a growing number of universities in Canada and Australia emerged as major contributors to higher education research.

In the third phase, one university each from mainland China and South Africa entered the top 50 list. This development reflects the growing research capacity and institutional strengthening of countries in the Global South. These universities have not only become active participants in global knowledge production but also demonstrated the potential to evolve into major centres of research in the field. The comparison of main host countries for these institutional knowledge production centres across phases is summarised in Table D3.

Table D3. Main Countries Hosting Knowledge Production Centers in Higher Education Research by Phase

Country	P1 (1991-2004)	P2 (2005-2014)	P3 (2015-2024)
USA	38	26	25
UK	7	9	6
Canada	2	5	5
Australia	2	8	10
Netherlands	1	2	2
Mainland China	0	0	1
South Africa	0	0	1

A closer examination of the Top 50 list reveals clear patterns of continuity, disappearance, and emergence among the institutional centres of higher education research. Between the first and second phases, 12 universities dropped out of the top 50, 10 of which were based in the United States. At the same time, 12 new centres emerged, seven of them located in Australia. This is a remarkable figure considering that Australia has only 38 universities in total.

Across the three phases, 19 universities consistently appeared in the top 50 list. This persistence suggests that once a robust knowledge tradition and supporting research infrastructure are established, institutions are well positioned to evolve and sustain their influence over time. These enduring centres continue to shape the field through their long-standing traditions, intellectual leadership, and global impact. Case studies of these long-established knowledge production centres would provide valuable insights into their organisational structures, research traditions, and agendas, as well as the ways in which they sustain and reproduce researchers within the field. The universities that have maintained this continuity are highlighted in Table D2.

It is important to bear in mind that when examining knowledge production centres at either the national or institutional level, substantial variation exists in the scale and structure of higher education systems across countries. At the national level, large systems such as those in the United States and China each encompass more than 4,000 universities, whereas smaller systems, such as those in the Netherlands and Australia, include only a limited number of institutions nationwide. At the institutional level, the size and composition of universities also differ markedly. Some, such as the University of London, are federations comprising multiple constituent institutions rather than single entities. Therefore, any

interpretation or conclusion regarding the scale or influence of knowledge production centres should be made with careful, case-by-case consideration.

Another important point to note is that in identifying these centres, we included only affiliations containing university-based addresses, thereby excluding other types of institutions such as those in the industrial and public sectors that also contribute to higher education knowledge production. Higher education research has increasingly adopted the characteristics of Mode 2 knowledge production, where inputs from multiple sectors and cross-sector collaborations have become common practice.

Our analysis indicates that this trend is already visible, as a considerable number of papers were published exclusively by non-university institutions. Specifically, 69 such papers were identified in Australia, 267 in the United Kingdom, and 2,093 in the United States. In future editions of the report, a more detailed analysis of collaboration types will be undertaken to generate deeper insights into these patterns of cross-sectoral engagement.

Key Venues for Knowledge Dissemination

The establishment and growth of global higher education research depend not only on the production of knowledge but also on the communication networks through which that knowledge is disseminated. According to Marginson (2022a), the material domain at the global scale is represented primarily through English-language journals indexed in major international databases. In this study, journals publishing higher education research papers are regarded as the venues for knowledge dissemination. Our dataset shows that the total over 200,000 papers were published across 1,058 journals worldwide.

From these, we identified a group of *key venues*, defined as journals that published more than 100 papers within any five-year period. Of the 1,058 journals, 252 or nearly one quarter, met this criterion. The statistics for these journals are presented in Table D4. Collectively, this quarter of journals accounted for nearly 70 per cent of all publications in the field.

Table D4. Venues for Global Knowledge Dissemination in Higher Education Research

Total Venues	1,058		
	P1 (1991-2004)	P2 (2005-2014)	P3 (2015-2024)
Number	220	820	1,060
Key Venues	**252**		
	P1 (1991-2004)	P2 (2005-2014)	P3 (2015-2024)
Total Number	74	221	248
Overlap/New Entries	n/a	77/144	218/30
Journals Belonging to Multiple Countries	20	40	27
Number of Hosting Countries	8	26	32

Analysis across phases reveals that the growth rate of key venues lagged behind the overall creation of new journals. Although new publication outlets have continued to appear globally, becoming a central platform for knowledge dissemination requires time and accumulation of academic recognition. A closer examination of the temporal pattern shows that the number of key venues nearly tripled in the second phase compared with the first, while growth slowed considerably in the third phase, with only 30 new journals emerging as major centres of dissemination. The degree of overlap between phases also indicates that some previously established venues have ceased to play a central role over time.

Another notable finding is that many of the 252 key venues are interdisciplinary in nature. Among these journals, 37 are related to medicine or health education, 28 focus on science education, and another 28 specialise in engineering education. Within the list of the top 20 journals that have published the largest number of higher education research papers, eight concentrate on medical and health topics, while others focus on areas such as chemistry, information technology, and physics (see Table D5). This pattern reinforces the earlier finding concerning the disciplinary backgrounds of the hidden mass group, many of whom are affiliated with medicine, science, and engineering. Together, these results confirm the inherently interdisciplinary character of knowledge production within higher education research, where ideas, methods, and topics frequently intersect across disciplinary boundaries.

Table D5. Top 20 Journals Publishing Largest Number of Higher Education Research Papers

Journal	Total Publication Number
JOURNAL OF CHEMICAL EDUCATION	5,356
BMC MEDICAL EDUCATION	3,908
ACADEMIC MEDICINE	3,428
JOURNAL OF AMERICAN COLLEGE HEALTH	2,760
NURSE EDUCATION TODAY	2,588
HIGHER EDUCATION	2,534
EDUCATION SCIENCES	2,308
STUDIES IN HIGHER EDUCATION	2,266
MEDICAL TEACHER	2,228
MEDICAL EDUCATION	1,998
INTERNATIONAL JOURNAL OF ENGINEERING EDUCATION	1,824
EDUCATION AND INFORMATION TECHNOLOGIES	1,704
FRONTIERS IN EDUCATION	1,627
COMPUTERS & EDUCATION	1,547
AMERICAN JOURNAL OF PHARMACEUTICAL EDUCATION	1,471
COMMUNITY COLLEGE JOURNAL OF RESEARCH AND PRACTICE	1,372
HIGHER EDUCATION RESEARCH & DEVELOPMENT	1,303
EUROPEAN JOURNAL OF PHYSICS	1,251
JOURNAL OF COLLEGE STUDENT DEVELOPMENT	1,243
JOURNAL OF SURGICAL EDUCATION	1,240

Drawing on publisher address information provided by the WoS, we examined the geographical distribution of these key venues to identify where they are based. The results show that the publishers of these journals are concentrated in 32 countries, with 77 journals associated with multiple countries. The presence of journals with multiple publisher addresses may reflect several situations: some journals have changed publishers over time; some large publishing houses maintain head offices in different countries; and in other cases, a journal may have multiple publishers located in various regions.

In the first phase, 74 key venues were located across 8 countries and regions. In the second phase, a clear trend towards diversification emerged. Several new key venues appeared in emerging economies such as Turkey, while additional journals were established in parts of Asia, Latin America, and Africa, although their numbers remained limited.

In the third phase, this diversification continued to deepen, with a growing number of countries in the Global South emerging as hosts of key venues. Notably, while the United States remains the leading producer of higher education research, the United Kingdom has surpassed it as the principal centre for knowledge dissemination since the second phase, hosting the largest number of key journals in the field. A comparison of the top ten countries for knowledge production and dissemination reveals substantial overlap between the two groups, although subtle differences can be observed in both their composition and ranking (see Table D6).

It is also noteworthy that some journals display a clear national or regional focus, yet there is often a mismatch between their thematic orientation and the geographical location of their publishers. For instance, the *Asia Pacific Education Review* is published in the Netherlands, the *Asia Pacific Journal of Education* is hosted in the United Kingdom, and the *Australian Educational Researcher* has its head office in the Netherlands. This mismatch highlights an important area for future investigation to better understand the underlying logic and considerations behind the spatial distribution of journal publishers.

It should also be recognised that all of these key venues publish in English. In recent decades, an increasing number of regional academic outlets have been established in Asia, Latin America, and Europe that publish in national languages. These journals play an essential role in facilitating knowledge exchange within their respective regions, although their global visibility remains limited. This observation reinforces the argument that the forces shaping higher education research operate across multiple scales—local, national, regional, and global. Consequently, adopting a multi-scalar analytical lens is crucial for understanding the contemporary nature and characteristics of higher education knowledge production.

Table D6. Leading Countries/Regions for Higher Education Knowledge Production and Dissemination

Top Ten Countries/Regions Producing the Largest Number of Higher Education Publications	Top Ten Countries Hosting Key Venues for Higher Education Research
United States	United Kingdom
United Kingdom	United States
Australia	Netherlands
Canada	Turkey
Mainland China	Germany
Spain	Canada
Turkey	Australia
South Africa	Ukraine
Germany	New Zealand
Taiwan, China	Switzerland

D4. RESEARCH COLLABORATION PATTERNS

The globalisation of academia and the proliferation of the internet have fostered a sustained shift towards collaborative knowledge production. By 2022, co-authored publications accounted for more than 90 per cent of all science and engineering articles (NSF, 2024). Nevertheless, significant disciplinary disparities persist in co-authorship patterns. While the humanities continue to emphasise solitary scholarship, the social sciences increasingly exhibit collaboration trends similar to those of the natural sciences. Between 2000 and 2020, internationally co-authored papers in SSCI-indexed social science journals increased by 140 per cent, whereas nationally co-authored publications remained relatively stable and single-authored papers declined by 35 per cent (Kwiek, 2023).

A substantial body of research has examined the motivations and outcomes of collaborative knowledge production across the social sciences. Scholars commonly engage in co-authorship to strengthen research credibility, access specialised expertise, enhance publication productivity, and secure research funding (Katz & Martin, 1997; Fuchs & Sandoval, 2020). Both formal institutional ties and informal academic networks play crucial roles in initiating and structuring collaborative teams (Leydesdorff & Wagner, 2008). These dynamics have been documented across a range of social science disciplines, including sociology, political science, and economics (Larivière, Gingras, & Archambault, 2009), as well as education and communication studies (Kosmützky & Wöhlert, 2021) and management research (González-Alcaide, Gorraiz, & Hervás, 2018).

Scholars have also explored the costs and benefits of co-authorship. For many researchers, particularly those at early career stages, collaboration enhances visibility and research quality. However, it also requires considerable time and effort for coordination, negotiation, and project management (Bozeman & Corley, 2004; Zhe, Lu, & Xiong, 2021).

Our data indicate that within the field of higher education research, the majority of papers are co-authored by two scholars, followed by single-authored and three-authored publications. Unlike laboratory-based sciences, where research is often conducted by large teams involving dozens of contributors, it is exceptionally rare for higher education papers to include more than six authors. Notably, more than one fifth of these publications are single-authored, reflecting the continued significance of individual scholarship within the field.

The evolution of the proportion of single-authored and collaboratively authored publications over time reflects the broader transformation of knowledge production in higher education research from Mode I to Mode II. In 1998, individually authored studies accounted for more than one third of all

publications. This share remained relatively stable above 30 per cent until 2012. In 2013, however, the proportion declined markedly and the downward trend continued through to 2024. By the end of this period, the share of single-authored papers had fallen to roughly half of its earlier peak, as illustrated in Figure D6.

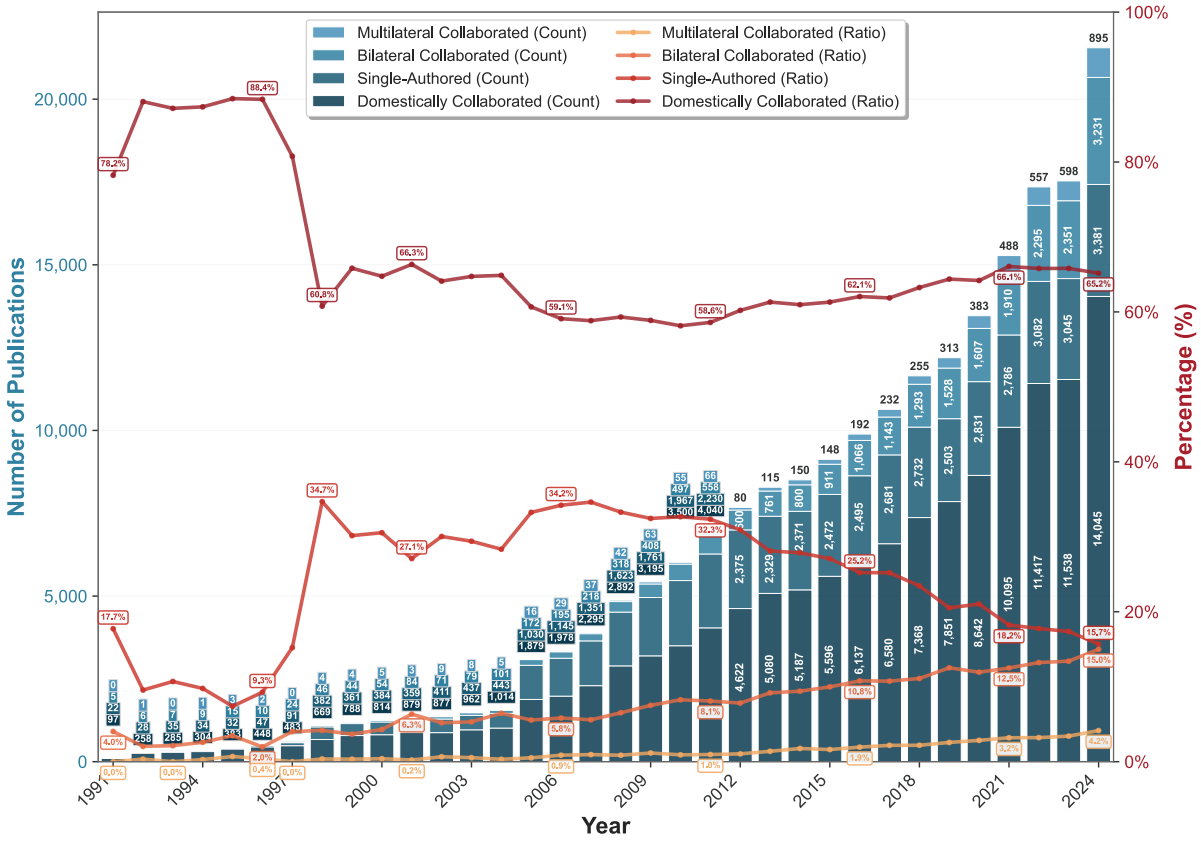


Figure D6. Author Collaboration Patterns in Higher Education Research by Year

This gradual decline in individually authored work suggests that collaborative research has become an increasingly common practice within higher education studies. Collaborative research offers several advantages, particularly its capacity to manage large datasets and conduct longitudinal or multi-institutional projects. Nevertheless, this trend may also reflect a growing convergence between the social sciences and the research paradigms characteristic of the natural sciences. Such convergence is especially salient in the contemporary context of performance-based academic evaluation, where collaboration is often incentivised and rewarded.

At the global level, the rising proportion of collaboratively authored papers has been driven primarily by domestic collaborations. Although its share has gradually declined over the past two decades, they still account for nearly two thirds of all publications. The growth of international collaboration has been particularly notable since the emergence of the global higher education research space. Among internationally co-authored papers, partnerships between two countries remain the most common, while multilateral collaborations

involving three or more countries are still limited, representing less than 5 per cent of the total.

However, this global pattern conceals distinct differences across national/regional contexts. As the United States contributes nearly two fifths of all higher education research publications worldwide, its data exert a strong influence on the overall global trend. The top ten countries/regions leading higher education knowledge production vary considerably in their collaborative patterns. For instance, internationally co-authored papers account for around two fifths of all publications in some countries such as mainland China and Germany, whereas in the United States and Turkey the proportion is below 15 per cent. Turkey records the highest proportion of single authored publications at close to one third of its total output. In contrast, the share in Spain is markedly lower at under one tenth of all publications as shown in Figure D7. These divergences in modes of knowledge production across countries reaffirm the importance of adopting a multi-scalar analytical perspective when interpreting research activities in the field of higher education.

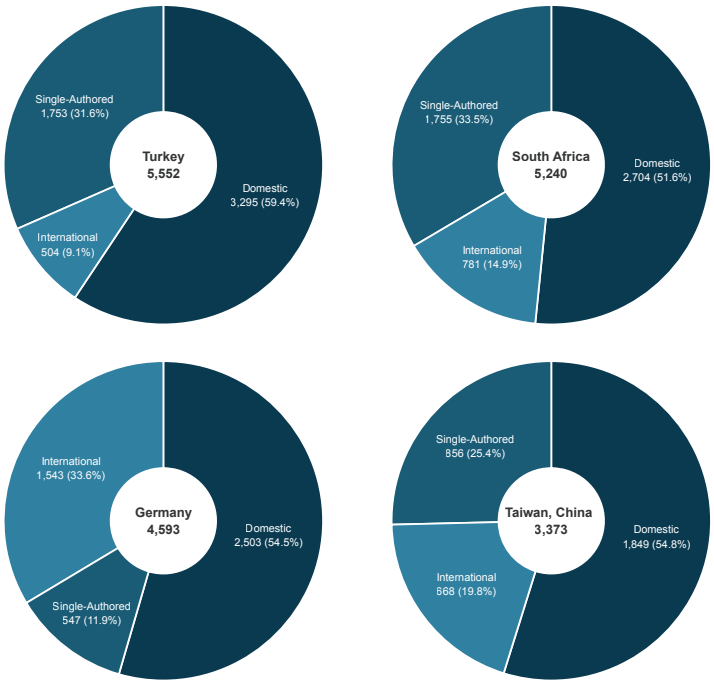


Figure D7. Collaboration Patterns among the Top Ten Countries/Regions in Global Higher Education Knowledge Production

In the past decade, the sluggishness of globalisation, which was once the major determining force of internationalisation, has become increasingly apparent. A combination of factors has contributed to this slowdown, including rising geopolitical tensions, the growth of nationalism and populism, and the spread of anti-integration and anti-immigration policies. These developments have signalled a clear shift away from the liberal, open world order that had defined global relations since the late twentieth century (Altbach & de Wit, 2020; Finardi & Guimarães, 2020; Marginson, 2020). The global financial crisis of 2008, followed by the disruptions of the COVID-19 pandemic, revealed the vulnerabilities of interconnected systems of trade, labour, and education. As a result, many states have moved to protect their borders, control migration, and reassert sovereignty over supply chains and industries that were previously globalised.

At the same time, regional cooperation has intensified across many parts of the world, reflecting a shift from global integration toward regional consolidation. Supranational regional frameworks such as the EU, the African Union, and ASEAN have played a major role in shaping regional higher education landscapes through initiatives such as the Bologna Process, Erasmus+, and the ASEAN Qualifications Reference Framework (AQRF) (e.g. Leskina & Sabzalieva, 2021; Pogorelskaya, 2023; Woldegiorgis & Knight, 2017).

Research collaboration between countries and regions is influenced by a complex combination of structural, cultural, and policy factors. Key determinants include geographic proximity, historical and linguistic ties, and shared economic or political interests, all of which make regional partnerships more viable and sustainable. Scholars increasingly argue that regionalisation functions both as a response to and a safeguard against global market volatility. Rather than signalling the end of globalisation, these developments represent a reconfiguration of the global order. The contemporary landscape is thus characterised by selective interdependence, regional resilience, and

intensified cross-border linkages.

Thus, our report also examines the pattern of regional collaboration in higher education knowledge production. At the global level, intra-regional collaboration continues to dominate, with only 12.6 per cent of publications representing cross-regional partnerships. This finding highlights the persistence of regional research networks and the limited extent to which academic collaboration has become globalised, even in an era of digital connectivity and international mobility. The uneven distribution of global research capacity and infrastructure, along with language, funding, and policy barriers, further reinforces this regional concentration of scholarly exchange.

For the purpose of analysis, we classified all publications into nine regions based on the authors' institutional affiliations: North America (United States, Canada, and Mexico), South America (all South American countries), Sub-Saharan Africa (excluding North Africa due to cultural and economic distinctiveness), North Africa and the Middle East (MENAT) (including both North African and Middle Eastern countries), WNSE (Western, Northern, and Southern Europe), EECA (Russia, Ukraine, the Caucasus, and Central Asian Republics), East Asia (mainland China, Japan, South Korea, Taiwan ,China and Mongolia), SSA (South and Southeast Asia), and Oceania (Australia, New Zealand, and the Pacific Islands). For papers with multiple authors or authors holding more than one institutional affiliation, the count for each relevant country was increased by one.

As illustrated in Figure D8, North America and WNSE have emerged as the most prominent hubs of collaboration, serving as principal partners for nearly all other regions in higher education research. In addition to these two leading regions, Oceania has developed an extensive collaboration network, positioning itself as an important bridge between Asia and the wider Anglophone academic world.

Figure D8. Regional Collaboration Heatmap in Global Higher Education Knowledge Production

Beyond these major hubs of knowledge production and collaboration, several weaker interregional ties warrant attention. South America demonstrates limited connections with other regions, maintaining modest collaborative links mainly with North America, WNSE, and Oceania. Similarly, EECA display few research collaborations with both South America and Sub-Saharan Africa. These weak ties point to current gaps in the global research network but also suggest potential areas for strengthening future partnerships in higher education research.

In examining national partnerships, we identified all paired countries from a total of 28,223 internationally co-authored papers and developed a national collaboration network map, as illustrated in Figure D9. In this map, the colour of the links represents the intensity of collaborative activity between countries. The most frequent partnerships include the United States and Canada (1,683), the United States and the United Kingdom (1,137), the United Kingdom and Australia (1,111), Mainland China and the United States (1,014), the United States and Australia (799), Mainland China and Hong Kong SAR, China (582), Korea and the United States (570), Canada and the United Kingdom (478), Germany and the United States (454), and Turkey and the United States (390).

These findings demonstrate that global collaboration in higher education research remains strongly concentrated among English-speaking nations, reflecting both linguistic commonality and long-established academic linkages. The United States has developed the most extensive collaboration network, engaging with 160 partner countries, followed by the United Kingdom (149), Australia (119), and Germany (118).

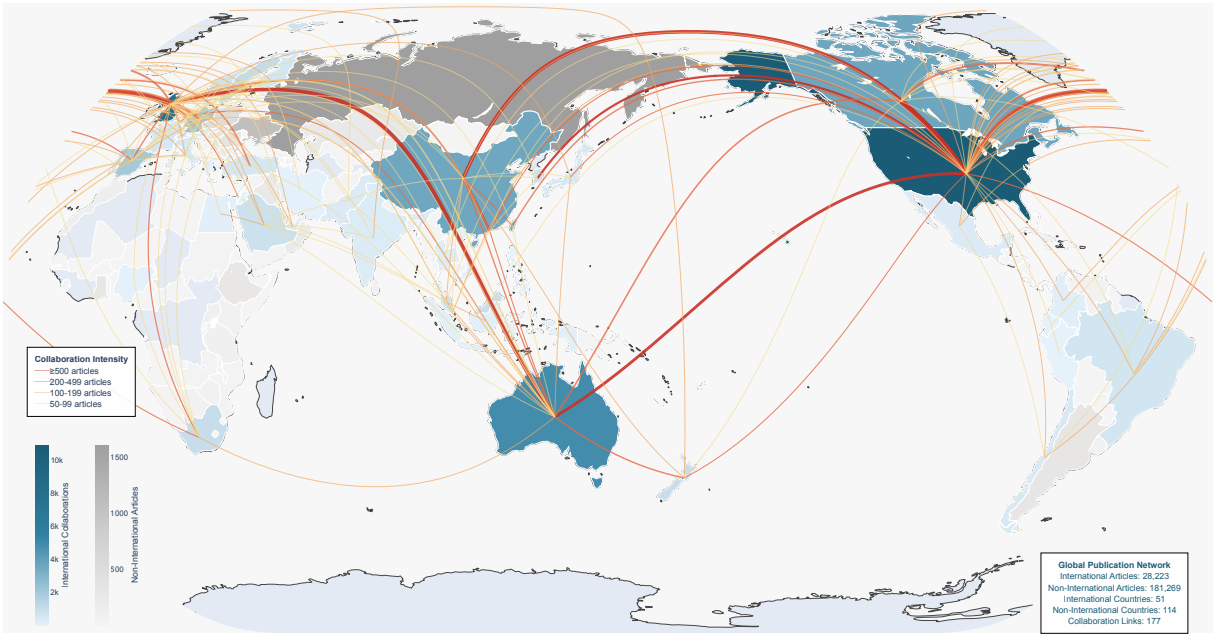


Figure D9. Collaboration Partners Network Map

D5. RESEARCH AGENDA AND THEMATIC STRUCTURE

One of the strengths of this report lies in the application of STM to identify and analyse research agendas across multiple scales. Compared with traditional keyword co-occurrence analysis, the STM approach offers a distinct advantage by uncovering paradigms, methodologies, and specific research topics rather than merely aggregating broad thematic areas within higher education studies. The use of STM also enables the tracking of topic evolution over time and the examination of relationships among topics.

Identified Topics

At the global scale, our STM analysis identified 55 distinct topics that have been explored by higher education researchers worldwide. Table D7 presents these topics in descending order of size. Alongside each topic label, the table lists the top 20 FREX and high-probability terms to provide a detailed representation of their thematic content. The largest topic, T49 *Bridging Learning, Practice and Research*, not only highlights specific areas of scholarly interest but also reflect a defining paradigm of higher education research that links inquiry, teaching, and professional practice. It is common for scholars in this field to discuss the practical and policy implications of their research findings, thereby reinforcing the connection between theoretical development and applied contexts. This relationship is evident in the high-probability terms associated with this topic, such as *design*, *theory*, and *reflection*. Moreover, the FREX terms reveal more focused areas of inquiry within this topic, including *work-integrated learning (WIL), work-based learning (WBL), and community of practice (CoP)*, which illustrate the field's sustained engagement with practice-oriented education.

Table D7. Research Topics Identified at the Global Scale (Ranked by Topic Size, Descending Order)

Topic	Label	Top 20 FREX terms	Top 20 Highest Prob terms	Average proportion
49	Bridging learning, practice & research	wil,wbl,cop,reflection,rpl,workbased,collaborative,transformative,sotl,reflective,informal,framework,transdisciplinary,collaboration,apprenticeship,pedagogic,authentic,designbased,lifelong,workintegrated	learning,practice,approach,development,framework,context,process,design,project,theory,reflection,collaborative,understanding,case,model,action,challenge,knowledge,collaboration,work	5.57%
51	Theories & Discourse	deleuze,assemblage,posthuman,epistemic_injustice,guattaris,posthumanist,diffractive,deleuze_guattaris,guattari,michel_foucault,morethanhuman,foucault,philosophical,discursive,arendt,deleuze_guattari,foucauldian,bakhtins,materialist,discursively	critical,way,social,discourse,work,space,practice,theory,argue,narrative,scholar,scholarship,author,power,pedagogy,new,notion,researcher,field,drawing	4.77%

Topic	Label	Top 20 FREX terms	Top 20 Highest Prob terms	Average proportion
6	Student Experience on Campus	food_insecurity,servicelearning,insecurity,transition,volunteering,barrier,cure,service,engagement,experience,perception,veteran,felt,extracurricular,cocurricular,volunteer,mixedmethods,perceive,food_security,transitioning	student,experience,support,perception,survey,engagement,service,undergraduate,transition,interview,barrier,qualitative,reported,challenge,benefit,response,participation,need,opportunity,perceived	3.60%
41	Classroom Instruction	flipped_classroom,flipped,flipped_classroom_model,flipped_classroom_approach,preclass,inclass,clickers,instructor,flipping,tbl,flipped_classroom_fc,lecture,boppps,cbl,powerpoint,studentcentered,lecturebased,video,traditional_lecturebased,cooperative	course,student,learning,class,instructor,classroom,teaching,approach,lecture,video,instructional,activity,traditional,instruction,active,group,method,material,discussion,semester	3.41%
18	Higher Education Economics & Policy	tuition_fee,fee,pbf,labour,privatisation,labour_market,government,policy_maker,privatization,union,policy,financing,eu,market,recession,european_union,tuition,worldclass,maker,economy	policy,public,national,economic,system,state,government,reform,institution,country,market,sector,private,funding,institutional,new,change,financial,decade,political	3.19%
3	Student's Professional Preparation	ukrainian,ukraine,russian,peculiarity,teachinglearning,proposal,ideological_political,methodical,steam,czech,kyiv,modern,informatization,russia,formation,methodology,put_forward,carried,stage,forming	process,training,method,teaching,development,activity,methodology,based,subject,main,work,professional,aim,stage,student,pedagogical,carried,future,new,present	3.04%
23	Teacher Education	preservice,pete,tpack,pst,edtpa,teacher,studentteachers,pck,inservice,coteaching,pgce,cooperating,certificate_pgce,pe,lesson,microteaching,selfstudy,tpck,practicum,it	teacher,teaching,classroom,preservice,practice,educator,professional,data,interview,lesson,researcher,knowledge,development,observation,participant,content,pedagogical,experience,qualitative,teach	2.88%
21	University Partnership & Outreach	ahcs,lesson_learned,outreach,cbpr,consortium,program,communitybased,hs,universitycommunity,amcs,british_columbia,extension,ahc,programmatic,rcr,partnership,underserved,nonprofit,center_ahcs,health_center_ahcs	program,community,state,health,project,training,development,center,united,need,partnership,united_state,implementation,effort,goal,initiative,author,model,public,provide	2.72%
29	Tertiary Chemistry Education	spectroscopy,nmr,electron,chromatography,hydrogen,solvent,reagent,oxidation,spectrometry,spectrometer,nanoparticles,nmr_spectroscopy,ligand,spectroscopic,uvvis,organic_chemistry_laboratory,photon,mass_spectrometry,orbitals,absorbance	chemistry,laboratory,experiment,student,undergraduate,reaction,chemical,using,lab,used,organic,simple,concept,technique,energy,method,molecular,experimental,also,cell	2.67%
9	Academic Integrity	plagiarism,cheating,dishonesty,contract_cheating,integrity,uk,lecturer,new_zealand,australian,programme,staff,whilst,contract,academic,zealand,honour,cheat,australia,tertiary,fe	academic,programme,staff,uk,lecturer,student,australian,postgraduate,issue,teaching,australia,work,need,range,new,institution,discipline,support,concern,tertiary	2.58%
12	Methods_Statistics	internet_addiction,descriptive_inferential,ttest_oneway,statistic,ankara,oneway_variance,kruskal,descriptive_inferential_statistic,using_descriptive_inferential,inferential_statistic,ttest_anova,random_sampling,descriptive_statistic,turkey,ex_post_facto,ttest_oneway_anova,descriptive_correlational,sdlr,ex_post,variance_anova	data,level,significant,student,used,questionnaire,difference,sample,using,method,variable,descriptive,quantitative,statistic,collected,showed,statistical,mean,statistically,among	2.56%
11	Student Retention & Pathway	dual_enrollment,attrition,dropout,enroll,cte,enrollment,coursetaking,fouryear,coop,summer_bridge,enrolling,urm,stem,graduation,fafsa,corequisite,attainment,ap,persistence,noncompleters	student,degree,stem,year,rate,success,career,retention,choice,major,likely,first,enrollment,institution,completion,outcome,graduation,postsecondary,transfer,data	2.50%

Topic	Label	Top 20 FREX terms	Top 20 Highest Prob terms	Average proportion
34	Quality Assurance	quality_assurance,tqm,assurance,external_quality_assurance,universityindustry,qa,universityindustry_collaboration,aacsb,supply_chain,quality_assurance_qa,heis,hei,internal_quality_assurance,mba,triple_helix,quality,strength_weakness,innovation,obe,supply_chain_management	quality,management,system,institution,innovation,business,stakeholder,evaluation,process,implementation,purpose,standard,improvement,review,development,heis,strategy,strategic,model,approach	2.40%
13	Student Performance	ta,grade,attendance,size,grade_inflation,economics,spent,smaller,metaanalysis,grading,estimate,si,amount,relative,heterogeneity,average,spend,distribution,assistant_ta,magnitude	effect,grade,time,student,difference,number,average,size,evaluation,across,class,data,point,whether,large,le,characteristic,set,different,rating	2.34%
44	Student's Knowledge Acquisition	cognitive_load,refutation,mind_map,emme,proof,refutation_text,map,spatial,textbook,argumentation,comic,load,analogical,extraneous,eye_tracking,seductive_detail,selfexplanation,representational,toulmins,selfexplaining	concept,cognitive,task,knowledge,reasoning,representation,different,understanding,textbook,pattern,used,process,student,two,condition,map,explanation,interpretation,conceptual,researcher	2.31%
4	Student's Motivation & Academic Achievement	performanceapproach,performanceavoidance,intrinsic_motivation,growth_mindset,performanceapproach_goal,srl,performanceavoidance_goal,masteryapproach,competence_relatedness,masteryapproach_goal,intrinsic,intrinsic_extrinsic_motivation,extrinsic_motivation,autonomy_competence_relatedness,selfdetermination_theory,extrinsic,intrinsic_extrinsic,fixed_mindset,selfregulation,motivational	motivation,student,achievement,learning,selfefficacy,academic,strategy,goal,engagement,performance,orientation,profile,cognitive,relationship,effect,motivational,outcome,interest,metacognitive,intrinsic	2.12%
52	Engineering Education	electrical_engineering,civil_engineering,digital_signal_processing,mechatronics,simulink,matlabsimulink,bim,electrical_machine,programmable_logic,induction_motor,fpga,controller,robot,dc_motor,computer_aided,engineer,robotics,power_electronics,abet,automation	engineering,design,system,computer,project,student,course,software,tool,programming,module,undergraduate,application,developed,model,used,using,present,engineer,computing	2.11%
22	Use of Digital Tools	ai,twitter,facebook,mobile_device,artificial_intelligence_ai,genai,networking_site,social_networking_site,generative_ai,mobile_phone,instagram,tweet,mobile,generative_artificial,chatgpt,podcasting,laptop,apps,oer,mlearning	use,technology,information,tool,medium,using,resource,social,used,mobile,application,user,internet,ai,web,ict,student,usage,data,device	2.05%
19	Online & Blended Learning	massive_open,massive_open_online,mooc,mooocs,coi,digital_badge,bl,sdl,transactional_distance,community_inquiry_coi,inquiry_coi,badge,vle,ert,synchronous_asynchronous,synchronous,emergency_remote_teaching,distance,coursera,emergency_remote	online,learning,digital,environment,distance,elearning,teaching,open,learner,platform,blended,facetoface,interaction,virtual,mode,remote,course,presence,delivery,challenge	2.02%
38	Experimental Approaches in Medical Skills Training	auscultation,bls,postworkshop,cpr,motivational_interviewing,pre_posttest,pre_post,pre_postworkshop,pre_postintervention,pal,pre_posttraining,randomly_allocated,pretest_posttest,pre_postcourse,sps,cardiac_auscultation,pre,pretest,pre_posttest_score,postintervention	group,control,intervention,participant,skill,student,training,experimental,confidence,knowledge,session,significant,significantly,effect,posttest,score,week,two,workshop,improvement	1.96%
7	Applied Curriculum and Graduate Skills	veterinary,veterinarian,animal,animal_welfare,employer,sri,employability,generic,ethic,soft,geography,transferable,attribute,ethical,agricultural,graduate,lanka,ethical_dilemma,moral,accountant	skill,curriculum,graduate,undergraduate,professional,need,student,ethical,ethic,industry,knowledge,development,attribute,employability,work,course,veterinary,develop,required,employer	1.92%

Topic	Label	Top 20 FREX terms	Top 20 Highest Prob terms	Average proportion
35	Student Identity & Belonging	racial_microaggressions,cultural_wealth,hsis,community_cultural_wealth,undocumented,pwis,predominantly_white_institution,latinx,colorblind,sense_belonging,systemic_racism,predominantly_white,racism,selfauthorship,minoritized,daca,pwi,crt,crossracial,hsi	identity,diversity,student,experience,black,white,race,racial,sense,community,belonging,equity,social,group,minority,ethnic,participant,color,critical,diverse	1.87%
15	Entrepreneurial Education	entrepreneurial_intention,partial_least,square_structural,entrepreneurial,equation_modeling,plssem,entrepreneurship,continuance_intention,hospitality_tourism,equation_modelling,equation_modeling_plssem,subjective_norm,behavioral_intention,tpb,behavioural_intention,entrepreneurial_intention_ei,tourism_hospitality,partial_least_square,hospitality,entrepreneurial_passion	factor,model,influence,perceived,satisfaction,intention,relationship,student,structural,effect,modeling,equation,entrepreneurial,entrepreneurship,theory,significant,impact,role,structural_equation,using	1.81%
20	Methods_Scale	convergent_discriminant,internal_consistency,functioning_dif,convergent_discriminant_validity,dif,internal_consistency_reliability,unidimensionality,valid_reliable_instrument,criterionrelated_validity,psychometric_property,reliable_valid_instrument,irt,itemtotal,square_error_approximation,mcdonalds_omega,testretest_reliability,criterionrelated,valid_reliable,rasch_measurement,good_internal_consistency	item,scale,instrument,factor,validity,measure,reliability,model,measurement,construct,used,structure,using,sample,test,version,valid,internal,reliable,developed	1.80%
14	Standard Setting and Predictive Assessment	pcat,naplex,pcoa,osces,mcat,ukcat,exam,examiner,nbce,mcqs,osce_station,osce,formative_summative,summative,cba,umat,dreem,ugpa,gre,examination_osces	assessment,performance,score,student,test,examination,exam,year,final,testing,formative,method,compared,assessed,ass,admission,mean,significantly,first,objective	1.78%
43	Academic Mentorship and Career Advancement	mentees,mentoring,mentor_mentees,protege,mentee,postdoc,mentormentee,gtas,doctoral,mentor_mentee,tenuretrack,phd,mentor,doctorate,gta,mentor_protege,supervisees,internship,mentorship,edd	faculty,member,career,doctoral,mentoring,mentor,development,professional,supervisor,department,phd,support,internship,work,relationship,supervision,role,professor,coaching,productivity	1.75%
48	EFL Education	wtc,iranian_efl,iranian_efl_learner,emi,willingness_communicate_wtc,cefr,actfl,dubbing,idle,accentedness,preintermediate,lls,willingness_communicate,nonenglish_major,elp,capt,speaking,fla,tblt,englishmedium_instruction_emi	language,english,learner,foreign,efl,proficiency,learning,second,instruction,participant,speaking,strategy,listening,speaker,context,vocabulary,linguistic,two,translation,classroom	1.69%
17	Educational Leadership and Organisational Change	transformational_leadership,leadership,servant_leadership,organizational,rpps,leader,servant,ocb,transformational,employee,commitment,rpp,organisational,sna,trust,succession_planning,principal,researchpractice_partnership,principalship,empowerment	change,leadership,role,leader,organizational,commitment,institutional,network,organization,administrator,interview,principal,trust,work,structure,individual,employee,professional,relationship,data	1.67%
46	Medical and Pharmacy Education	gross_anatomy,anatomy,anat,anat_sci,appe,ebm,pharmacy,appes,anatomist,pharmd,gross_anatomy_laboratory,gross_anatomy_course,agreed_strongly,anatomical,ippe,cadaveric_dissection,pharmacist,strongly_agreed,pharmacogenomics,ppcp	medical,student,clinical,pharmacy,medicine,curriculum,year,teaching,method,survey,anatomy,objective,school,clerkship,response,doctor,agreed,questionnaire,practice,faculty	1.58%
31	Intellectual Disability & Social Inclusion	people_intellectual_disability,aboriginal,strait,aboriginal_torres,strait_islander,intellectual_disability,adult_intellectual_disability,ypar,maori,torres,young_people,refugee,museum,action_par,asylum,participatory_action_par,gallery,idd,nonindigenous,intellectual_disability_id	people,disability,adult,art,young,life,inclusive,researcher,special,indigenous,inclusion,youth,intellectual,social,older,young_people,need,story,voice,work	1.52%

Topic	Label	Top 20 FREX terms	Top 20 Highest Prob terms	Average proportion
5	Learning Difficulties in Math & Physics	problem_solving,solving,cps,algebra,mathematical,calculus,answer,mathematical_problem_solving,linear_algebra,problem_solver,fci,illstructured,problem,incorrect_answer,solve,manipulatives,incorrect,homework,algebraic,wicked	problem,student,question,mathematics,difficulty,mathematical,answer,solution,solving,understanding,problemsolving,problem_solving,ability,solve,response,one,correct,concept,error,difficult	1.52%
45	Competency-Based Medical Education	epa,cbme,scoping_review,scoping,consensus,decision_making,cpd,hpe,gp,delphi,wba,entrustable_professional,entrustable_professional_activity,consultation,professionalism,competency,pif,entrustable,canmeds,competencybased	competency,decision,expert,review,identified,method,literature,making,process,trainee,decisionmaking,professional,professionalism,used,training,phase,core,consensus,domain,theme	1.42%
42	Educational Accessibility & Equality	gifted_talented,voucher,highpoverty,new_york_city,upper_secondary_school,ib,upper_secondary,kipp,schoolwide,suburban,sel,urban,district,rural,schoollevel,charter,ccr,school,middle,secondary	school,high,secondary,primary,rural,urban,middle,district,pupil,year,city,socioeconomic,area,data,schooling,background,elementary,researcher,family,public	1.41%
40	Peer and Corrective Feedback	wcf,written_corrective,corrective_feedback,argumentative_essay,awe,cscl,feedback,dmc,tutee,writing,corrective,cf,tutor,computersupported_collaborative,computersupported_collaborative_learning,tutoring,oral_presentation,feedforward,error_correction,evaluative_judgement	feedback,writing,peer,student,written,tutor,task,essay,comment,assignment,process,group,presentation,tutoring,provided,writer,write,two,interaction,oral	1.39%
33	Nursing & Clinical Education	registered_nurse,ipe,endoflife_care,palliative_care,palliative,interprofessional_ipe,preregistration_nursing,nurse,nursing_midwifery,interprofessional,transcribed_verbatim,preregistration,lic,nursing,nurse_midwife,newly_graduated_nurse,ripls,midwifery,prelicensure,endoflife	care,nursing,clinical,health,patient,nurse,practice,student,professional,healthcare,placement,method,theme,setting,experience,interview,participant,interprofessional,background,qualitative	1.33%
37	Epistemological Beliefs in STEM Learning	epistemological_belief,ssi,science,next_generation_science,scientifically_literate,pseudoscientific,socioscientific,subject_matter,socioscientific_issue,ibl,phenomenographic,scientist,nosi,ng,astronomy,socioscientific_issue_ssi,belief,paranormal,conception,biology	science,belief,scientific,student,physic,knowledge,biology,understanding,discipline,conception,scientist,nature,inquiry,view,major,subject,evolution,undergraduate,natural,matter	1.28%
27	Internationalisation & Student Mobility	hong,hong_kong,kong,united_arab,emirate,mainland_chinese,branch_campus,tne,mainland_chinese_student,emirate_uae,mainland,united_arab_emirate,ibcs,mainland_china,returnees,student_hong_kong,acculturative_stress,hong_kong_student,uae,offshore	international,social,student,chinese,country,china,capital,mobility,abroad,adjustment,home,hong,united,kong,hong_kong,studying,western,experience,adaptation,host	1.26%
47	Innovative Digital Pedagogies	serious_game,escape_room,vr,virtual_reality,gbl,virtual_reality_vr,computational_thinking,game based,immersive_virtual_reality,game,gameplay,ct,gaming,computational_thinking_ct,immersive,pjbl,immersive_vr,gamification,higherorder_thinking_skill,ivr	thinking,critical,team,game,learning,student,virtual,simulation,skill,pbl,design,reality,scenario,activity,environment,ct,teamwork,using,problembased,vr	1.17%
16	Legal and Policy Issues	court,mission_statement,supreme_court,cccu,ncaa,peerreviewed_journal,intercollegiate,supreme,intercollegiate_athletics,vet,legal,kinesiology,human_right,military,publish,ncaa_division,club,editorial,editorial_board,title	journal,sport,publication,published,right,law,author,legal,statement,issue,board,review,library,athlete,scholarly,institution,researcher,publishing,mission,division	1.12%

Topic	Label	Top 20 FREX terms	Top 20 Highest Prob terms	Average proportion
1	Historical and Bibliometric Analysis of Scholarship	que,de_la,janeiro,dans,rio_de,como,estudiantes,rio_de_janeiro,en_la,de,escritura,este,lenseignement,rio,la,agrave,sobre,sont,aux,dans_le	history,century,al,de,et,field,historical,st,la,year,et_al,thesis,first,citation,scholar,publication,st_century,trend,topic,database	1.09%
53	Early Childhood Autism Support	ecec,toddler,early_childhood,vibrato,early_head_start,early_childhood_care,infant_toddler,gross_motor,vending_machine,field_early_childhood,teacherchild_interaction,developmentally_appropriate,head_start,developmentally_appropriate_practice,quality_early_childhood,fba,playbased,childhood,snack,mealtime	child,early,intervention,parent,family,childrens,researcher,childhood,early_childhood,food,play,preschool,year,mother,nutrition,participant,setting,age,young,developmental	1.08%
26	Sustainability	proenvironmental,proenvironmental_behavior,esd,sdgs,sl,ghg,sustainability,proenvironmental_behaviour,peb,biodiversity,csr,carbon_footprint,environmentally_responsible,sustainabilityrelated,ecological_footprint,sdg,environmental,sustainable,global_warming,cce	attitude,toward,towards,behavior,sustainability,environmental,sustainable,positive,social,climate,change,awareness,knowledge,student,purpose,impact,development,value,issue,future	1.08%
30	Student's Risk Behaviours & Drug Use	cigarette,marijuana,binge_drinking,drinker,drinking,drank,alcoholrelated,drinking_motif,highrisk_drinking,alcoholrelated_consequence,alcohol_marijuana,binge,alcohol_consumption,waterpipe,smoker,heavy_drinking,risky_drinking,cannabis,vaping,pregaming	risk,physical,student,use,behavior,activity,participant,associated,among,alcohol,objective,regression,health,reported,method,logistic,association,survey,pa,prevalence	1.07%
8	Reading Comprehension & Lexical Processing	morphological_awareness,dyslexics,lexical_bundle,nonword,orthographic,struggling_reader,biliteracy,speller,pseudoword,nonwords,phonemic_awareness,phonemic,print_exposure,miscue,emergent_bilingual,verbal_working_memory,spanishenglish,reading_comprehension,rapid_naming,reading	reading,literacy,text,word,comprehension,reader,read,vocabulary,book,reading_comprehension,bilingual,instruction,corpus,linguistic,knowledge,fluency,lexical,awareness,memory,researcher	1.05%
24	Student's Stress Coping	adhd,adhd_symptom,disorder_adhd,statetrait_anxiety,beck_depression,attention_deficit_hyperactivity,ld,perfectionistic,deficit_hyperactivity,depressive_symptom,depressive,mindfulness_meditation,mbsr,perfectionism,maladaptive_perfectionism,beck_depression_inventory,psqi,attentiondeficithyperactivity,diagnosed_adhd,hrv	anxiety,stress,psychological,student,depression,symptom,coping,level,resilience,counseling,relationship,scale,negative,among,associated,distress,participant,life,selfesteem,mindfulness	1.03%
36	Surgical Residency Training	pgy,orthopedic,absite,orthopedic_surgery,pgy_pgy,plastic_surgery,em_residency,vascular_surgery,orthopaedic_surgery,surg,gmite,mm_conference,thoracic_surgery,obgyn_residency,anastomosis,surg_ed,mock_oral,operating_room,hernia,duty_hour	resident,training,residency,physician,surgical,medical,surgery,medicine,trainee,program,specialty,patient,clinical,hospital,general,objective,postgraduate,survey,time,applicant	1.02%
50	Creativity and Personality	parenting_style,emotional_intelligence,mbti,emotional_intelligence_ei,relationship_emotional_intelligence,agreeableness,extraversion,trait_emotional_intelligence,jazz,agreeableness_conscientiousness,vark,personality_trait,extraversion_openness,swb,dark_triad,indicator_mbti,extraversion_agreeableness,myersbriggs,authoritative_parenting,nonmusic	emotional,style,creative,music,emotion,creativity,preference,relationship,personality,intelligence,trait,positive,conflict,negative,interpersonal,emotional_intelligence,musical,individual,attachment,personality_trait	0.92%

Topic	Label	Top 20 FREX terms	Top 20 Highest Prob terms	Average proportion
25	Intercultural Competence	intercultural_sensitivity,intercultural,culturally_linguistically_diverse,culturally_linguistically,multicultural,cq,culturally_competent,culturally_responsive,plurilingual,telecollaboration,competence,exchange,erasmus,cultural_humility,interculturally,cultural,transcultural,crosscultural,citizenship,culturally	cultural,competence,culture,global,intercultural,diverse,culturally,exchange,student,citizenship,different,multicultural,context,internationalization,local,awareness,responsive,crosscultural,japanese,japan	0.91%
32	Student Mental Health & COVID-19	mental_illness,nssi,suicide_prevention,depersonalization,suicide,disaster,exhaustion,burnout_syndrome,wellness,suicidal_ideation,impostor,burnout,pandemicrelated,pgrs,mental,emotional_exhaustion,ip,coronavirus_disease,maslach,mental_toughness	health,mental,covid,pandemic,wellbeing,covid_pandemic,burnout,impact,crisis,social,event,life,wellness,stigma,affected,participant,among,support,due,time	0.89%
28	Gendered Physiology	eating_disorder,body_fat,intuitive_eating,body_dissatisfaction,obese,isokinetic,pws,weight_kg,glass_ceiling,maledominated,breast_density,hamstring,percentage_body_fat,normalweight,genderscience,mental_retardation,body_fat_percentage,masculine,skin_tone,ebd	gender,woman,female,male,men,difference,body,male_female,age,girl,weight,disorder,boy,asd,stereotype,physical,spectrum,sex,gendered,fitness	0.83%
2	Dental Education	influenza,hpv_vaccine,hpv_vaccination,vaccinated,saveetha,vaccination,saveetha_dental,hbv,influenza_vaccination,vaccine,influenza_vaccine,chlamydia,hpv,hpv_hpv,hepatitis,breast_cancer,fluorosis,vaccine_hesitancy,get_vaccinated,meningococcal	dental,knowledge,health,cancer,patient,disease,among,ci,student,treatment,participant,questionnaire,oral,year,method,dentistry,prevention,awareness,survey,pain	0.76%
10	Decolonisation	south_africa,south_african,south_african_context,african_american_male,africa,south_african_institution,cape_town,african,apartheid,postapartheid,eastern_cape,western_cape,south,institution_south_africa,african_continent,subsaharan,postapartheid_south,mandela,uct,nelson_mandela	american,south,african,africa,south_africa,north,south_african,asian,african_american,korean,korea,institution,indian,america,native,country,israel,challenge,context,india	0.67%
39	Campus Sexuality, Religion & Safety	esbian,transgender,sexual_violence,lgbt,lesbian_gay,sexual_harassment,bisexual_transgender,ipv,lgb,sexual_abuse,gay_lesbian,bisexual,intersex,intimate_partner,bullying,rape_myth,lgbtiq,gay,gay_men,harassment	sexual,religious,violence,campus,safety,bullying,incident,student,christian,religion,spiritual,sexuality,sex,queer,lgbtq,abuse,gay,harassment,partner,consent	0.64%
54	Communication & Hearing Impairment	deaf,hearing,dhh,visual_impairment,asl,deaf_hard,hearing_loss,deaf_hard_hearing,visually_impaired,hearing_impairment,hardofhearing,cochlear,deaf_hardofhearing,deaf_hearing,cochlear_implant,hearingimpaired,aac,interpreter,iep,hearing_dhh	communication,visual,loss,deaf,sound,speech,verbal,sign,accommodation,hard,hearing,communicate,student,communicating,mainstream,impairment,nonverbal,disability,maturity,special	0.45%
55	Health Knowledge & Awareness	knowledge,aware,screening,done,awareness,regarding,know,lack,utilization,among,would,known,every,good,regular,though,majority,undergoing,old,area	knowledge,among,year,also,level,regarding,awareness,one,important,data,well,may,however,participant,factor,lack,area,three,related,used	0.40%

Similarly, the second largest topic, T51 *Theories and Discourse*, also demonstrates this dual nature. On one hand, it reflects the established norm within higher education research to be grounded in rigorous theoretical frameworks, as indicated by its high-probability terms such as *theory, narrative, discourse, and notion*. On the other hand, theory development itself constitutes an important branch of higher education research. The FREX terms associated with this topic point to influential discourses and theorists that have profoundly shaped the field, including *post-humanism, epistemic injustice,* and the works of *Gilles Deleuze, Félix Guattari, Hannah Arendt, and Michel Foucault*.

Particularly, the ideas of Deleuze and Guattari have been widely applied in critical pedagogy, educational philosophy, and curriculum development, offering new conceptual tools for understanding learning as a dynamic and creative process. Arendt's work has been employed to reimagine education as a space of action and plurality rather than mere socialisation, to critique instrumentalism and neoliberal governance in universities, and to advance frameworks for democratic citizenship and ethical responsibility in education. Foucault's theories, meanwhile, provide a foundational lens for examining the relationship between power and knowledge, shaping how scholars analyse institutional structures, governance practices, and the production of academic subjectivities within higher education. Certain theories are particularly prominent within specific topics. For example, in studies categorised under T4 *Student Motivation and Academic Achievement*, self-determination theory exerts a strong influence.

Other prominent research topics include T6 *Student Experience on Campus*, T41 *Classroom Instruction*, T18 *Higher Education Economics and Policy*, and T3 *Student Professional Preparation*. Term-level analysis reveals that within T6, particular attention is given to issues such as food insecurity, transitional experiences, and the experiences of student veterans. T41 focuses on teaching and learning innovations, with frequent discussion of flipped classrooms, computer-based learning, and student-centred pedagogical approaches.

Certain topics are also closely associated with specific geographical contexts. For instance, references to the EU feature prominently in T18 *Higher Education Economics and Policy*, while Ukraine and Russia are central to T3 *Student Professional Preparation*. T27 *Internationalisation and Student Mobility* is particularly linked to Hong Kong SAR the United Arab Emirates, and Mainland China. Similarly, South Africa and the Sub-Saharan region are closely tied to T10 *Decolonisation*, while Iran appears prominently within T48 *EFL Education*.

Several other topics exhibit a distinctly cross-disciplinary nature, most notably those connected to the medical and health sciences. These include T38 *Experimental Approaches in Medical Skills Training*, T46 *Medical and Pharmacy Education*, T45 *Competency-Based Medical Education*, T33 *Nursing and Clinical Education*, and T2 *Dental Education*. The strong presence of medical-related topics can be largely attributed to the foundational period of higher education research in the United States, during which psychology and medical science played a pivotal role in shaping the research landscape. Given that the United States alone accounts for more than two fifths of all higher education publications globally, the international research agenda is inevitably influenced, and at times distorted, by its national research traditions and priorities.

This observation once again underscores the importance of adopting a multi-scalar analytical lens when examining knowledge production in higher education. The following sections of this report discuss research agendas and topic distributions in greater detail at both regional and national levels.

Other cross-disciplinary topics include T29 *Tertiary Chemistry Education*, T52 *Engineering Education*, and T5 *Learning Difficulties in Mathematics and Physics*. These interdisciplinary themes echo the earlier findings regarding the disciplinary backgrounds of higher education knowledge producers. Beyond

education, researchers from medicine, science, and engineering contribute substantially to the field's knowledge base.

The interdisciplinary nature of higher education research is also reflected at the term level. For instance, T21 *University Partnership and Outreach* is closely associated with public health, while T7 *Applied Curriculum and Graduate Skills* is frequently linked to veterinary, animal, and agricultural studies. These patterns demonstrate how higher education research draws intellectual resources and methods from a wide range of disciplines, reinforcing its position as a truly interdisciplinary field.

Among all the topics identified, a distinct cluster focusing on research methods warrants particular attention, as methodological approaches often reflect the epistemic traditions of a specific research community or discipline. These topics include T12 *Methods_Statistics*, which highlights descriptive, correlational, and inferential analyses. Interestingly, this quantitative orientation appears to be particularly associated with Turkey, which may help explain the country's growing prominence as one of the leading contributors to higher education research.

Another example is T38 *Experimental Approaches in Medical Skills Training*, a topic largely confined to tertiary medical education, typically involving pre- and post-intervention designs combined with motivational interviewing. Similarly, T20 *Methods_Scale* captures studies that rely on the use of instruments, factors, and models to measure educational constructs. In addition, T1 *Historical and Bibliometric Analysis of Scholarship* emerges as a distinct topic devoted to tracing the evolution and structure of knowledge production within the field.

The identification of these method-oriented topics, most of which are quantitative, indicates the prevalence of quantitative approaches in higher education research. This pattern reflects the field's growing methodological sophistication and its increasing engagement with empirical, data-based inquiry. At the same time, the prominence of quantitative methods demonstrates the influence of broader social science traditions that prioritise measurement, correlation, and statistical validation as key tools for generating knowledge. While qualitative and interpretive approaches are increasingly playing an important role in exploring the complexity of educational experience, the quantitative orientation remains a defining feature of contemporary higher education research.

Although qualitative methods are not identified as independent topics, their presence across multiple topics at the term level is substantial. Qualitative approaches such as interviews, the Delphi method, and observation are widely employed in studies categorised under T6 *Student Experience on Campus*, T23 *Teacher Education*, T17 *Educational Leadership and Organisational Change*, and T33 *Nursing and Clinical Education*. In addition, *story* appears as a distinct qualitative approach within T31 I*ntellectual Disability and Social Inclusion*, and *scoping review* is commonly found in T45 *Competency-Based Medical Education*. These findings indicate that while qualitative methodologies are less frequently the central focus of higher education research, they remain integral to exploring individual experiences, institutional cultures, and social processes within the field.

Topic Correlations

As explained in the methodology section, each paper in the dataset may encompass multiple topics, and certain topics are more likely to co-occur within the same publication, as indicated by Pearson correlation coefficients. In the heatmap (Figure D10) below, the colour intensity represents the degree of correlation between pairs of topics. For instance, T48 *EFL Education* and T8 *Reading Comprehension and Lexical Processing* are highly likely to appear together within the same paper, with a correlation coefficient of 0.2. Other topic pairs frequently addressed in conjunction include T24 *Student Stress and Coping* and T32 *Student Mental Health and COVID-19*, as well as T27 *Internationalisation and Student Mobility* and T25 *Intercultural Competence*. T19 *Online and Blended Learning* is commonly examined alongside both T22

Use of Digital Tools (0.19) and T41 *Classroom Instruction* (0.17). Similarly, T13 *Student Performance* is closely associated with T11 *Student Retention and Pathways* (0.19) and T14 *Standard Setting and Predictive Assessment* (0.17). These associations suggest thematic clusters where research topics naturally converge.

In addition to the clusters of closely related topics, it is also noteworthy that certain topics are seldom examined together. This pattern may reveal existing gaps in the literature and point to potential directions for future research. For instance, T41 *Classroom Instruction*, which focuses on micro-level teaching and learning practices, shows negative associations with meso- or macro-level topics such as T17 *Educational Leadership and Organisational Change* and T18 *Higher Education Economics and Policy*. Similarly, the topic of classroom instruction appears to attract limited attention from scholars working on T35 *Student Identity and Belonging*. Although the current connections among these topics are weak, this does not imply that they are conceptually unrelated. In the context of increasingly diverse student populations, issues of identity and belonging may directly influence classroom practices and pedagogical outcomes. Future research that bridges these thematic areas could therefore yield valuable insights into how institutional, policy, and social dimensions interact with micro-level teaching and learning processes within higher education.

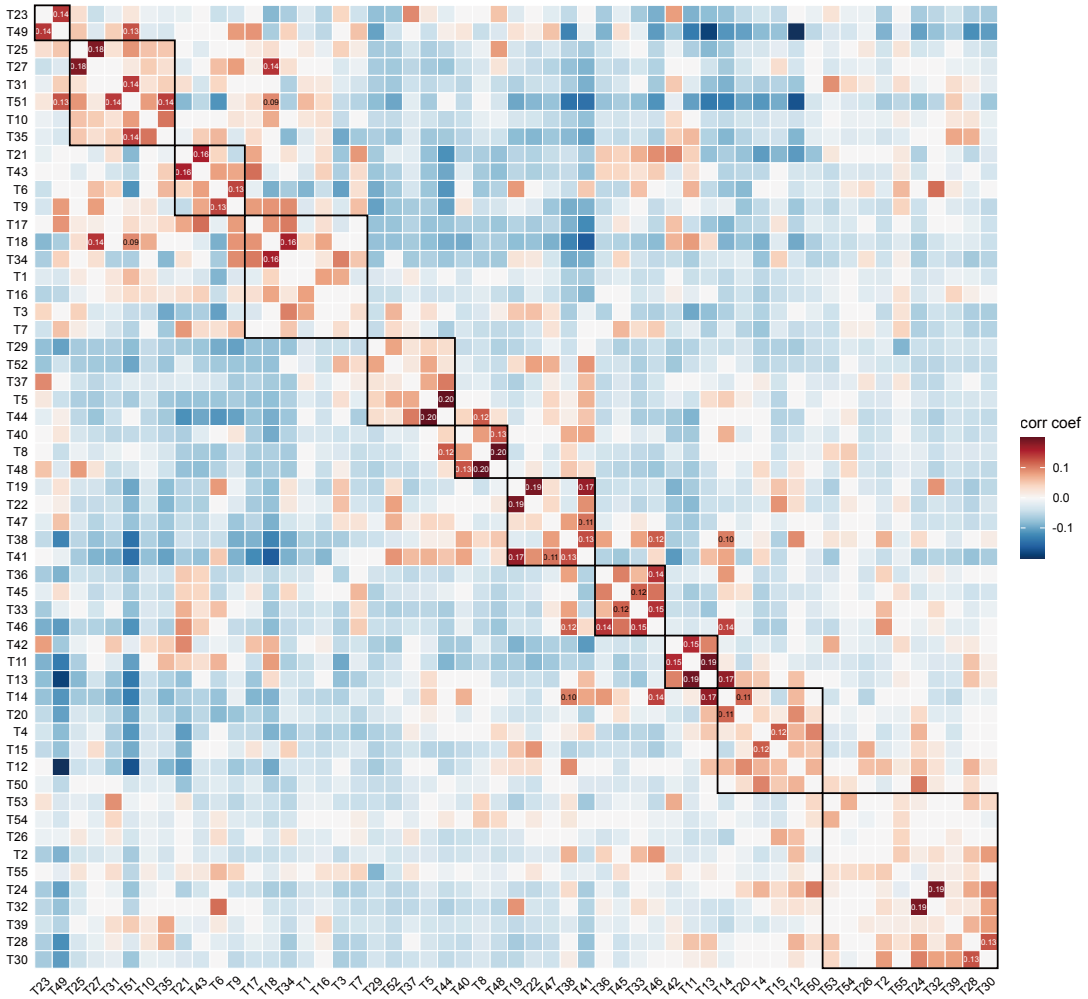


Figure D10. Heatmap of Topic Correlations

It should be borne in mind that there is more than one way to group topics. As shown in the dendrogram (Figure D11), the distance between topics reflects the degree of correlation among them. The number of clusters that can be identified depends on where the dividing line is drawn. Some clusters are relatively large and encompass multiple topics. For instance, the first cluster at the top of the figure includes ten topics, while others are smaller, containing only three or four. The larger clusters generally represent broad and well-established research domains within higher education studies, such as medical education. These clusters often integrate multiple related topics that share common theoretical foundations and methodological approaches, reflecting the maturity and internal coherence of these research areas. In contrast, the smaller clusters tend to capture more specialised niches, such as language education.

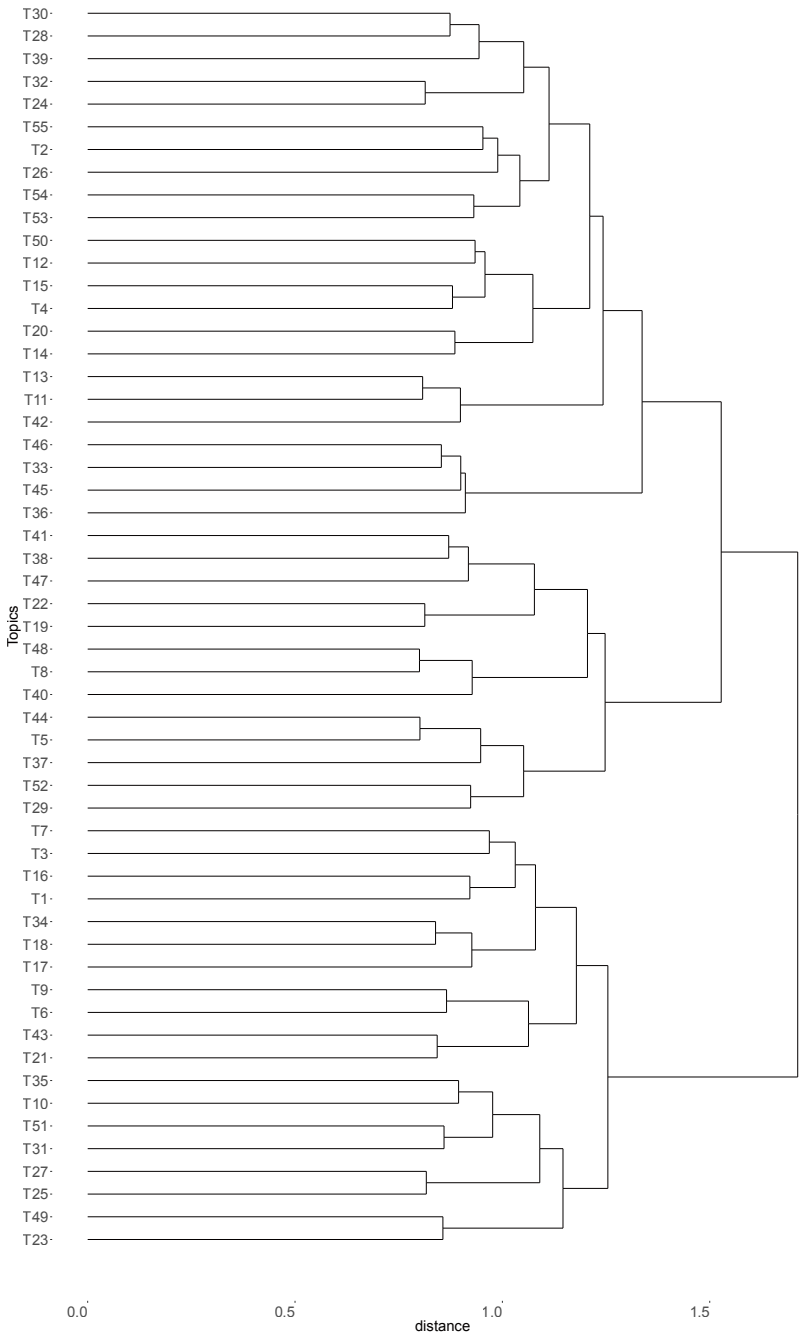


Figure D11. Dendrography of Topic Clusters

The bubble network (Figure D12) presented below offers an alternative way to understand the relationships between topics. Its main advantage is that it conveys both the relative size of each topic and the extent of its connections with others. It is noteworthy that some topics, although small in size, have developed extensive linkages across the research landscape. For example, T10 Decolonisation has an average proportion of less than one per cent, yet as a discourse it has a remarkably wide range of applications. References to decolonisation appear in discussions of many areas of higher education, including legal and policy issues, educational leadership and organisational change, intellectual disability and social inclusion, student identity and belonging, campus sexuality, religion and safety, and educational accessibility and equality.

The wide application of decolonisation across diverse research areas reflects its growing significance as both an analytical framework and a transformative agenda in higher education research. Its presence in studies ranging from policy and leadership to pedagogy and student experience suggests that decolonial perspectives are reshaping how scholars conceptualise power, knowledge, and identity within academic institutions. This expansion also indicates a shift towards greater reflexivity in the field, as researchers critically examine the historical legacies, epistemic hierarchies, and global asymmetries that continue to shape higher education. The integrative nature of the decolonisation discourse therefore signifies an important step towards a more inclusive and pluralistic understanding of knowledge production.

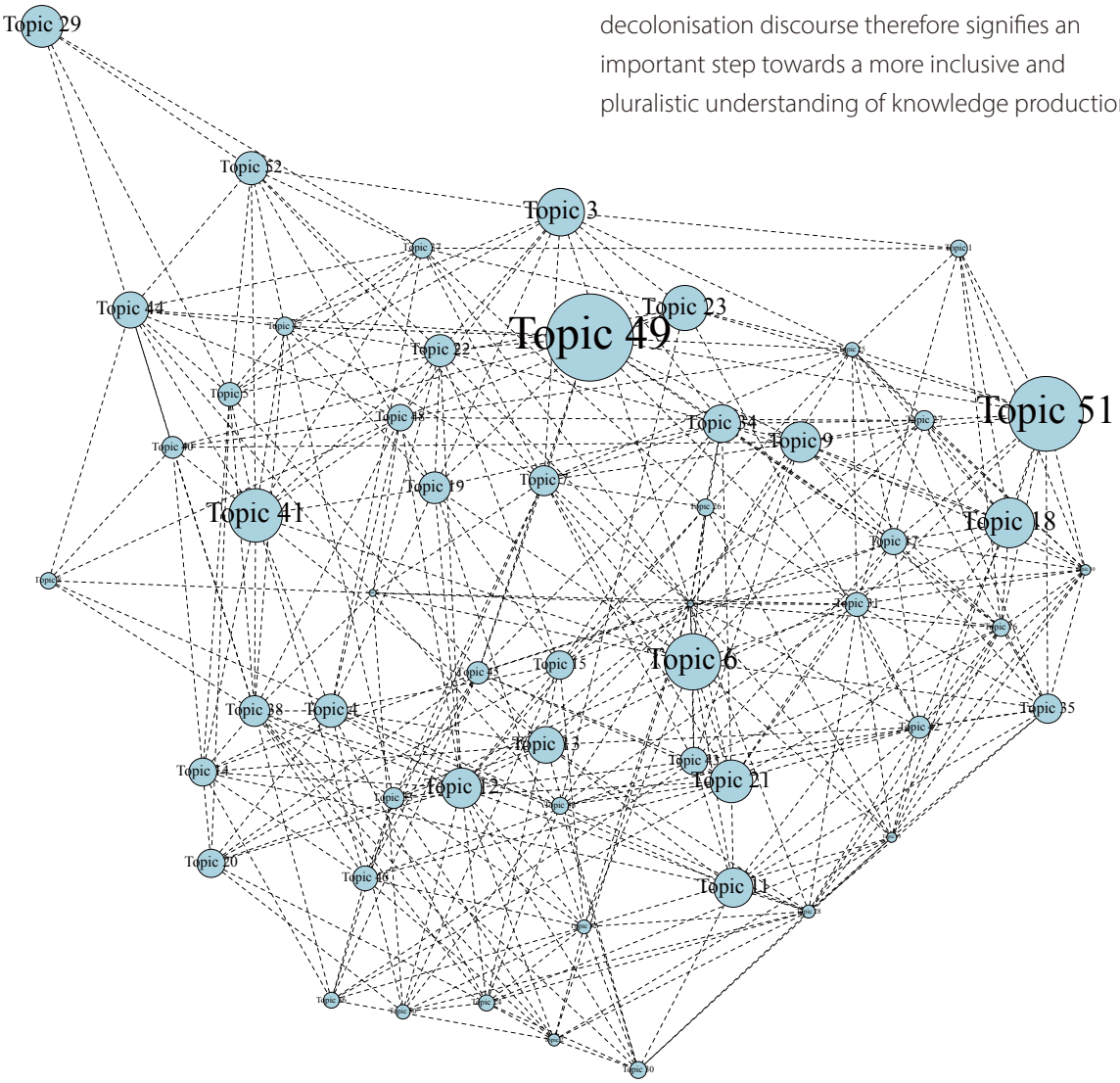


Figure D12. Bubble Network of Topic Correlations

Evolution of Topic Prevalence

Another advantage of the STM technique is that it enables the tracking of research agenda evolution across different scales. To capture the evolution of each topic's prevalence in greater detail, annual prevalence values were calculated and examined visually. Topics were then classified into one of four trend categories based on their overall direction and slope: Growing (showing a continuous upward trend), Declining (demonstrating a sustained downward trend), Stable (remaining relatively constant with only minor variation), and Fluctuating (exhibiting irregular or cyclical patterns). Figure D13. illustrate the prevalence evolution of all 55 topics across these four categories. The area of each coloured block represents the relative size of the topic. It should be emphasised that prior to 2005, the number of higher education studies was relatively limited, and the topic trends exhibited substantial fluctuation. Therefore, the analysis of tendencies from 2005 onwards provides a more accurate reflection of changes in topic prevalence over time. We also present these topics in a Matrix (see Figure D14).

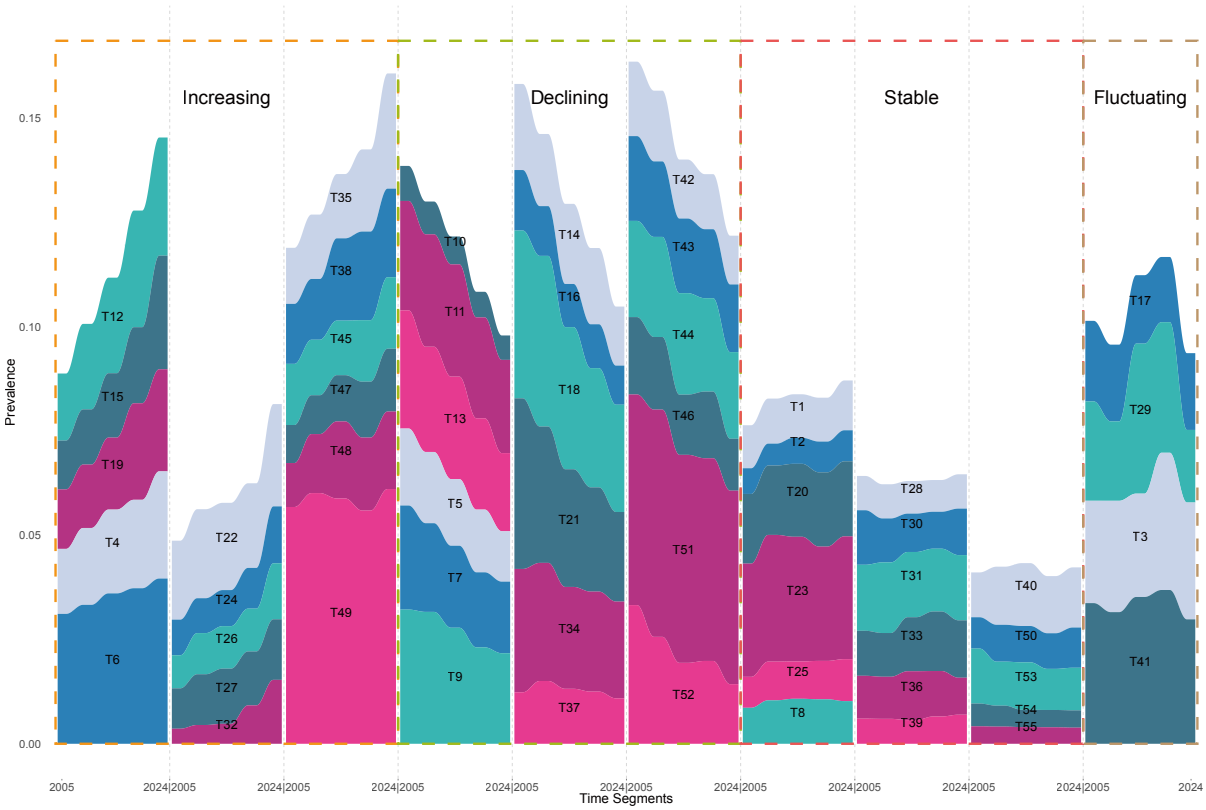


Figure D13. Research Topic Relative Prevalence Evolution Trend (2005-2024)

Figure D14. Research Topic Evolution Trend Matrix

Sixteen topics display sustained growth in scholarly attention. These topics represent the major drivers of intellectual growth within the field of higher education research. The increasing prominence of *Digital and Online Learning* (T19, T22, T47) reflects the global digital transformation that has been further accelerated by the COVID-19 pandemic. Topics such as Student Mental Health (T32), *Stress and Coping* (T24), and *Student Identity* (T35) highlight the growing emphasis on the affective, psychological, and experiential dimensions of learning. *Sustainability* (T26) and *Internationalisation* (T27) demonstrate the field's engagement with global challenges, while *Entrepreneurial Education* (T15) connects higher education to innovation and employability agendas. The rise of *Competency-based Medical Education* (T45) and *Experimental Methods in Medical Skills Training* (T38) indicates a wave of pedagogical reform within professional and clinical education.

Eighteen topics show a consistent decline between 2005 and 2024. This group reflects the gradual decline of structural and evaluative paradigms that once dominated higher education research. Policy-oriented topics (T16, T18, T21, T34) and assessment frameworks (T13, T14) have become less prevalent as global attention has shifted towards learner engagement, digital pedagogy, and educational technologies. The reduction of research on *Decolonisation* (T10) after 2020 suggests that, while once highly influential, the discourse has stabilised within a more specialised academic niche. The decline of disciplinary education topics such as *Medical and Pharmacy Education* (T46) and *Engineering Education* (T52) is particularly notable, given their historical significance in the field. One

possible explanation is the evolution of terminology and conceptual frameworks within these subfields. Alternatively, this trend may indicate a shift towards more integrated and cross-disciplinary approaches, as exemplified by the incorporation of engineering education into broader STEM education research.

Two topics, T49 *Bridging Learning, Practice and Research* and T51 *Theories and Discourse*, warrant particular attention. As discussed earlier, these two largest topics each represent not only specific research themes but also broader paradigmatic orientations within higher education research. The former shows a clear upward trend, whereas the latter has declined over time. This contrast may suggest that the field is undergoing a gradual shift from a predominantly theory-driven paradigm towards a more practice-oriented approach. Such a transformation reflects the increasing value placed on applied, context-sensitive, and actionable knowledge that directly informs educational practice and policy.

The Stable group comprises 17 topics. These enduring topics form the conceptual foundation of the higher education research landscape. Areas such as *Teacher Education* (T23), *Intercultural Competence* (T25), and *Inclusive Education* (T31, T53–T55) demonstrate the field's sustained commitment to equity, diversity, and professional learning. Meanwhile, *Creativity and Personality* (T50), *Peer Feedback* (T40), and *Reading Comprehension* (T8) reflect stable pedagogical interests that continue to underpin research on teaching quality and student learning outcomes. Although these topics do not show marked growth, their persistence indicates that they remain integral to the discipline's intellectual continuity and identity over time.

Four topics display notable cyclical or context-dependent variation. These themes tend to rise and fall in prominence in response to institutional and policy cycles. For instance, *Research on Educational Leadership* (T17) often gains traction during periods of structural reform, while *Professional Preparation* (T3) may align closely with shifts in employability and workforce development policies. Similarly, the visibility of *Chemistry Education* (T29) and *Classroom Instruction* (T41) may fluctuate in connection with curricular renewal initiatives and pedagogical innovation efforts.

There are four topics that specifically relate to the methodological approaches used in higher education research. The methodological landscape of the field demonstrates both consolidation and innovation over the past two decades. Among these method-related topics, *Methods_Statistics* (T12) and *Experimental Approaches in Medical Skills Training* (T38) show clear growth at the global scale, reflecting the field's increasing orientation toward evidence-based inquiry, data analytics, and simulation-supported experimentation. Their expansion aligns with the broader methodological diversification that has accompanied digital transformation and performance-focused pedagogies. In contrast, *Historical and Bibliometric Analysis of Scholarship* (T1) and *Methods_Scale* (T20) have remained stable, suggesting that traditional forms of meta-analytical investigation and quantitative scale development continue to underpin the methodological infrastructure of the discipline. Taken together, these patterns indicate that while higher education research retains its established analytical foundations, it is progressively embracing methodological modernisation driven by technology, empirical precision, and applied practice.

The global research landscape in higher education has transformed substantially over the past two decades. The field has moved from a policy- and institution-centred paradigm toward one that foregrounds digital learning, sustainability, and psychological wellbeing. The findings suggest a shift away from regulatory and assessment-oriented frameworks towards more human-centred approaches to learning at the global scale. The increasing focus on student wellbeing, identity, and stress management demonstrates that the affective and emotional dimensions of education have become central concerns of contemporary scholarship.

The growing prominence of online and blended

learning, digital tools, and innovative pedagogies highlights the deepening integration of technology into teaching and research practice. The COVID-19 pandemic acted as a powerful catalyst, embedding digitalisation as a defining structural feature of higher education worldwide. Similarly, the strong rise in sustainability and internationalisation reflects a turn towards global responsibility and social ethics, positioning universities as key agents in addressing environmental challenges and fostering intercultural understanding.

The decline in topics such as quality assurance, policy analysis, and theoretical discourse signals an epistemological transformation in the field. Higher education research has become increasingly empirical and data-driven, privileging applied inquiry and contextual relevance over abstract theorisation. Overall, the field now stands at a point of synthesis, combining methodological rigour with renewed attention to human experience, global citizenship, and social transformation.

Part

E

Regional Storylines: Knowledge Production across Selected Global South Regions

E1.
THE GLOBAL SOUTH IN THE WORLD SCIENCE SYSTEM

The Global South broadly encompasses regions historically subjected to colonialism and contemporary marginalisation within global knowledge hierarchies (Connell, 2007; Santos, 2015). The underrepresentation of the Global South in global knowledge production is empirically well-documented and persistent. According to UNESCO Science Report (2021), while the Global South accounts for over 85 per cent of the world's population, it contributed only 30 per cent of global research expenditure and 35 per cent of scientific publications in 2018.

This systemic underrepresentation reflects not absence of scholarly activity but structural inequalities in knowledge infrastructure: approximately 70 per cent of WoS-indexed journals are published in five Northern countries, while the entire Global South hosts fewer than 10 per cent (Collyer, 2016), and Global South publications receive, on average, 2.5 times fewer citations than Northern publications (Nielsen et al., 2021). Moreover, scholars from the Global South occupy fewer than 6 per cent of editorial positions in leading journals (Demeter, 2020), reinforcing structural exclusion from knowledge gatekeeping mechanisms and agenda-setting power.

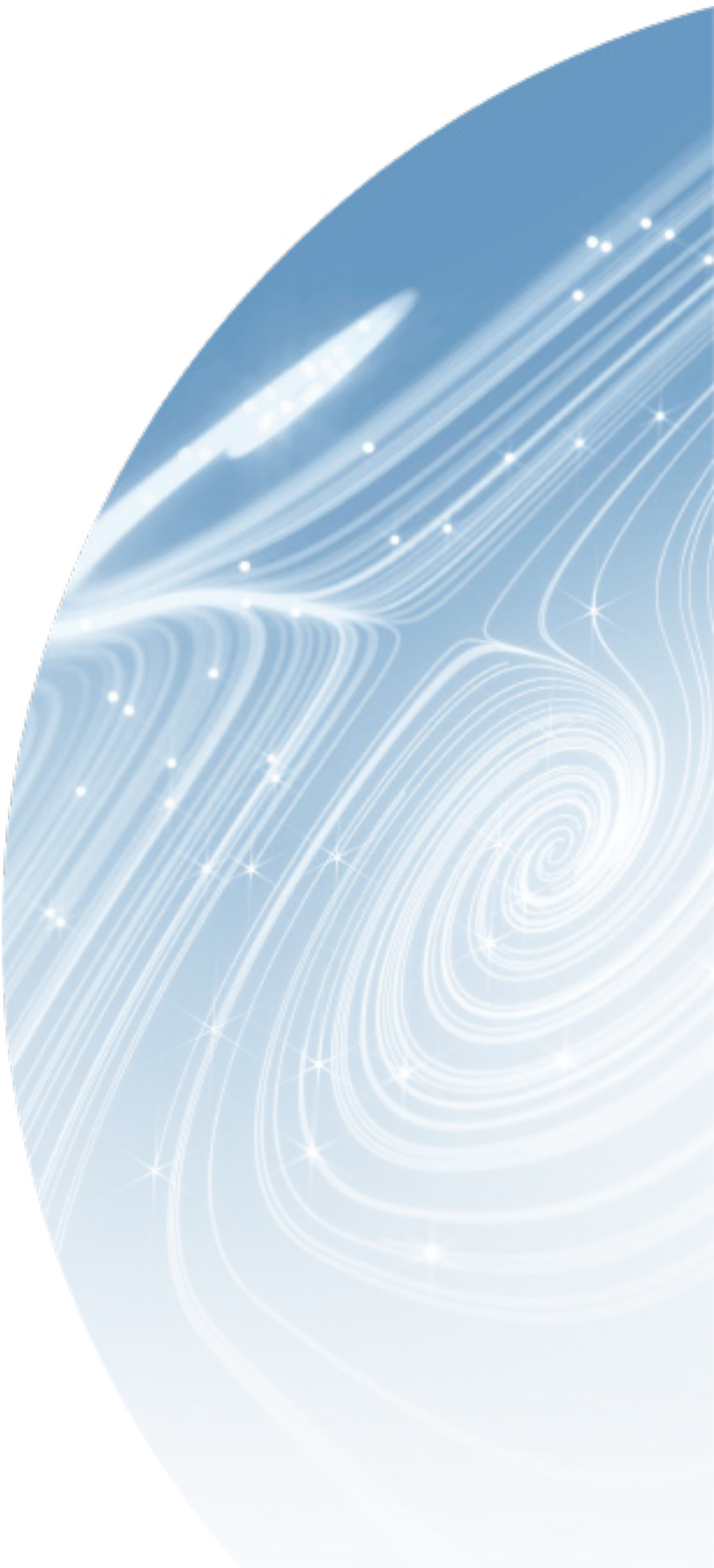
Researchers in the Global South face persistent challenges in achieving visibility. Until now, regions from the Global South used to be frequently positioned as a passive follower rather than an active producer of scientific knowledge (Wallerstein, 1974; Altbach, 2007). Such dependency was thought to have perpetuated a global division of academic labour, where Southern scholars often serve as data suppliers for theories developed in the North, a dynamic that marginalises indigenous knowledge and local epistemologies (Connell, 2020; de Sousa Santos, 2015). This imbalance is compounded by what Finardi et al. (2023) term "dependency by choice," where Global South scholars prioritise Northern journals to enhance recognition due to their exclusion from prestigious Northern indexes (Mills, 2024), however, often at the expense of local relevance.

Correspondingly, the central–peripheral framework, rooted in Wallerstein's World Systems Theory (1974), has widely been regarded as characterising the structure and dynamics of the Global Science System. A foundational theme in this discourse is the critique of "academic dependency" and "intellectual imperialism." Scholars argue that the Global South remains structurally dependent on Northern theoretical frameworks, methodologies, academic journals, and funding systems (Alatas, 2000; Alatas, 2003). Global university rankings and bibliometric databases often privilege Northern publication outlets and paradigms, thereby shaping global research agendas in ways that are misaligned with

Southern priorities (Lloyd & Ordorika, 2021; Mongeon & Paul-Hus, 2016). Dominant platforms such as WoS and Scopus have been overwhelmingly indexing English-language journals based in the Global North, reinforcing disparities in visibility and legitimacy (Marginson and Xu, 2023; Gates et al., 2024; Mills, 2024).

Besides, as most Global South scholars are non-Anglophone users, an inevitable factor causing inequality in their publication and global visibility is the dominance of English as the lingua franca of science (Altbach, 2007; Hanafi & Arvanitis, 2014). This problem is even more pronounced in the social sciences, which are intrinsically contextual and engage with local issues rooted in specific cultural, linguistic, historical, and political settings (Giddens, 1984; Hayhoe, 1993; Heilbron et al., 2008; Connell, 2020; Beigel, 2014; Alatas & Sinha, 2017). According to Hanafi and Arvanitis (2014), Mosbah-Natanson and Gingras (2014), and Vessuri et al. (2014), Latin America, Africa, and Southeast Asia collectively accounted for less than 20 per cent of indexed Social Sciences publications, with this proportion remaining largely unchanged despite recent growth.

Despite enduring structural constraints, scientific output and international collaboration across the Global South have expanded substantially, increasingly challenging the traditional centre–periphery binary. Countries such as China and India exemplify this shift, advancing through both robust domestic research systems and an accelerating share of global scientific production, including rising levels of international co-authorship (Aksnes & Sivertsen, 2023; NSF, 2024).



E2.
REGIONAL CONTEXTS OF SOUTHEAST ASIA, LATIN AMERICA, AND AFRICA

Latin America, Africa, and Southeast Asia are three representative regions where diverse institutional contexts and intellectual traditions reveal both shared structural constraints and varied strategic responses to epistemological dependency (Alatas, 2003; Beigel, 2014).

Southeast Asia (SEA) is heavily mediated by state-driven developmental agendas and regional association politics. Elite universities in Malaysia and Singapore have aggressively pursued "world-class" status through strategic internationalisation, performance-based funding, and active integration into global academic networks (Olds, 2007; Mok et al., 2023). This has led to a significant quantitative increase in research output, particularly in fields like engineering and technology. However, this growth is often critiqued for fostering a "metric culture" that prioritises international publication in Scopus or WoS-indexed journals over locally relevant and socially engaged scholarship (Hazelkorn, 2015). The role of ASEAN in fostering regional integration has created a distinct "ASEAN epistemic community," yet it simultaneously reinforces a competitive logic that mirrors global hierarchies, leaving less developed members like Cambodia and Laos struggling to keep pace (Khalid et al., 2019).

Latin America (LA) represents one of the most assertive challenges to Northern epistemological dominance, grounded in long-standing anti-colonial intellectual traditions and critiques stemming from dependency theory. Scholars in the region have actively built alternative knowledge infrastructures through institutions such as the Latin American Social Sciences Council and through pioneering open-access initiatives including SciELO and Redalyc, which purposefully elevate Spanish- and Portuguese-language scholarship as legitimate modes of scientific communication (Alperin et al., 2015; Beigel, 2014). Countries such as Brazil and Argentina have made substantial investments in national research systems designed to balance international visibility with strong commitments to domestic social priorities. As a result, Latin American researchers frequently operate in a dual register: engaging with global citation metrics and journal impact indicators while simultaneously engaging with local academic communities (Vessuri et al., 2014). This dynamic reflects what Beigel (2014) terms "dependent autonomy," whereby vibrant intellectual production coexists with continued structural subordination within global scientific hierarchies. Although geopolitical fragmentation, economic volatility, and ongoing northward migration of skilled researchers complicate efforts to build sustained regional epistemic cohesion, Latin America nonetheless continues to assert a distinct and influential scholarly voice.

Africa faces the most acute structural constraints yet

simultaneously asserts important forms of epistemic agency, particularly in areas where locally grounded knowledge is indispensable. Colonial legacies and contemporary neoliberal pressures intersect to produce significant obstacles: chronic resource shortages, infrastructural deficits, limited digital access, political volatility, and ongoing capacity loss through brain drain continue to shape much of the continent's academic environment (Teferra & Altbach, 2004; Cloete & Maassen, 2015). Even so, African researchers have established internationally recognised strengths, especially in medical and epidemiological research on HIV/AIDS, malaria, tuberculosis, and Ebola. Institutions such as the Kenya Medical Research Institute have earned global recognition for work on disease pathology, drug-resistance dynamics, and culturally grounded intervention strategies that Northern researchers are not positioned to replicate (Chu et al., 2014; Whitworth et al., 2008).

This scientific visibility, however, may reinforces neo-colonial dynamics. Research agendas are frequently set by Northern funders such as the Gates Foundation and the NIH, and African scientists are still too often confined to "field worker" positions rather than recognised as principal investigators (Crane, 2010; Geissler & Pool, 2006). Beyond biomedicine, African scholars have developed influential intellectual frameworks, including pan-African research networks such as Council for the Development of Social Science Research in Africa and Ubuntu-informed epistemologies, that directly challenge dominant Western paradigms. South Africa's disproportionate share of continent-wide publications, nonetheless, raises persistent concerns about intra-regional equity (Tijssen, 2007).

The broader "decolonising knowledge" movement promotes indigenous methodologies and scholarship in African languages (Ndlovu-Gatsheni, 2018). Yet structural incentives compel many academics to publish in English and in Northern journals to advance their careers, producing what Nyamnjoh (2012) describes as "epistemic occupations" that distance scholars from the communities they serve. This tension is especially pronounced in medical research, where African scientists generate irreplaceable insights into local health challenges but must align with external funding priorities and publication standards. These conditions raise fundamental questions about knowledge ownership, intellectual credit, and the distribution of benefits arising from research conducted on African soil.

The predominance of non-native English users in Global South academia, together with structurally weaker economies and the enduring legacy of colonialism, continues to marginalise regional knowledge production and generate significant imbalances in global scholarship. Although the centre–periphery framework offers a useful macro-level lens for understanding these asymmetries, it can also obscure the agency, strategic adaptation, and differentiated practices emerging within the so-called "periphery." These divergences signal the presence of agency, as many scholars and institutions deliberately orient their work toward local or regional audiences in response to contextual demands. Far from being passive recipients of Northern epistemological dominance, researchers across the Global South actively cultivate diverse strategies that allow them to participate in global knowledge circuits while advancing research agendas grounded in regional priorities. For this reason, a glonacal perspective provides a more fitting framework for understanding knowledge production in the Global South, capturing the interplay between global, national, and local dynamics that shape scholarly practice.

E3.

SELECTED GLOBAL SOUTH REGIONS' PARTICIPATION IN HIGHER EDUCATION KNOWLEDGE PRODUCTION

Bibliometric analysis confirms the persistent underrepresentation of the Global South in global higher education research. Across the past three decades, countries in the Global South have produced about only one-tenth journal articles in the field, contributing 21,616 publications out of a global total of 213,492. This share is substantially lower than that of the single largest contributor, the United States, which alone generated 82,473 articles. Although all three regions have experienced a notable acceleration in research output since the early 2020s, their collective and individual visibility within global higher education research remains markedly limited, as shown in Figure E1.

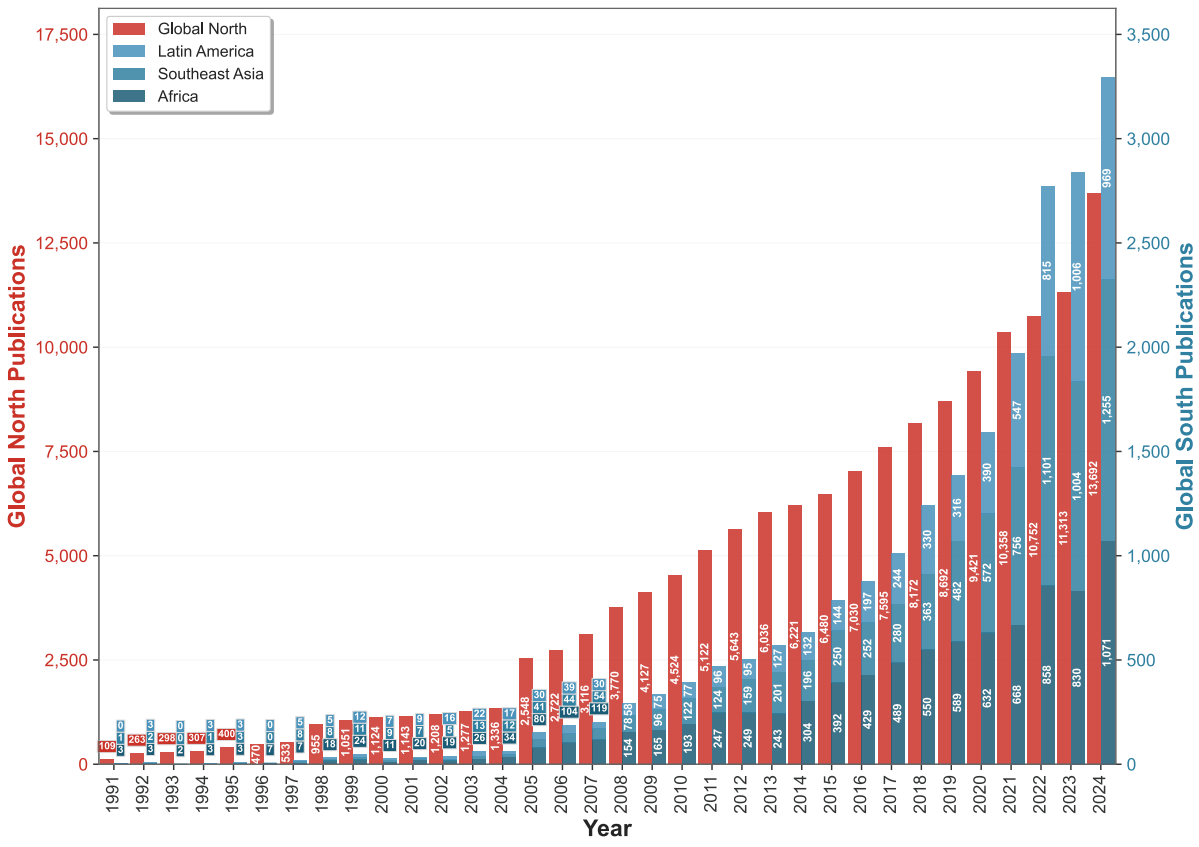


Figure E1. The Global South's Publications in Higher Education Research by Region (1991-2024)

A total of 53,356 authors from the Global South contributed to the publications analysed, compared with 297,382 authors from the Global North (see Table E1). Collaboration patterns, however, reveal marked asymmetries. Single-authorship rates are broadly similar across the two blocs, 20.81 per cent in the Global South and 22.17 per cent in the Global North, but cross-regional collaboration tells a different story. Among co-authored outputs from the Global South, a quarter included partners from the North, whereas only 3.80 per cent of Global North publications involved collaboration with Southern scholars.

Table E1. Descriptive Analysis of Publications from the Global South and the Global North

Region		Total Papers	Cross-Regional Co-authorships Papers	Total Authors	Single-Author Papers	Co-authorships with Global South/North	Active authors
Global North		147808	115305	297382	22.17%	3.80%	5947
Global South	Africa	8546	6082	19466	29.10%	27.51%	215
	Latin America	5819	5030	17615	13.63%	35.09%	102
	Southeast Asia	7510	6302	18725	16.26%	17.22%	297
	Total Global South	21616	17157	53356	20.81%	25.56%	608

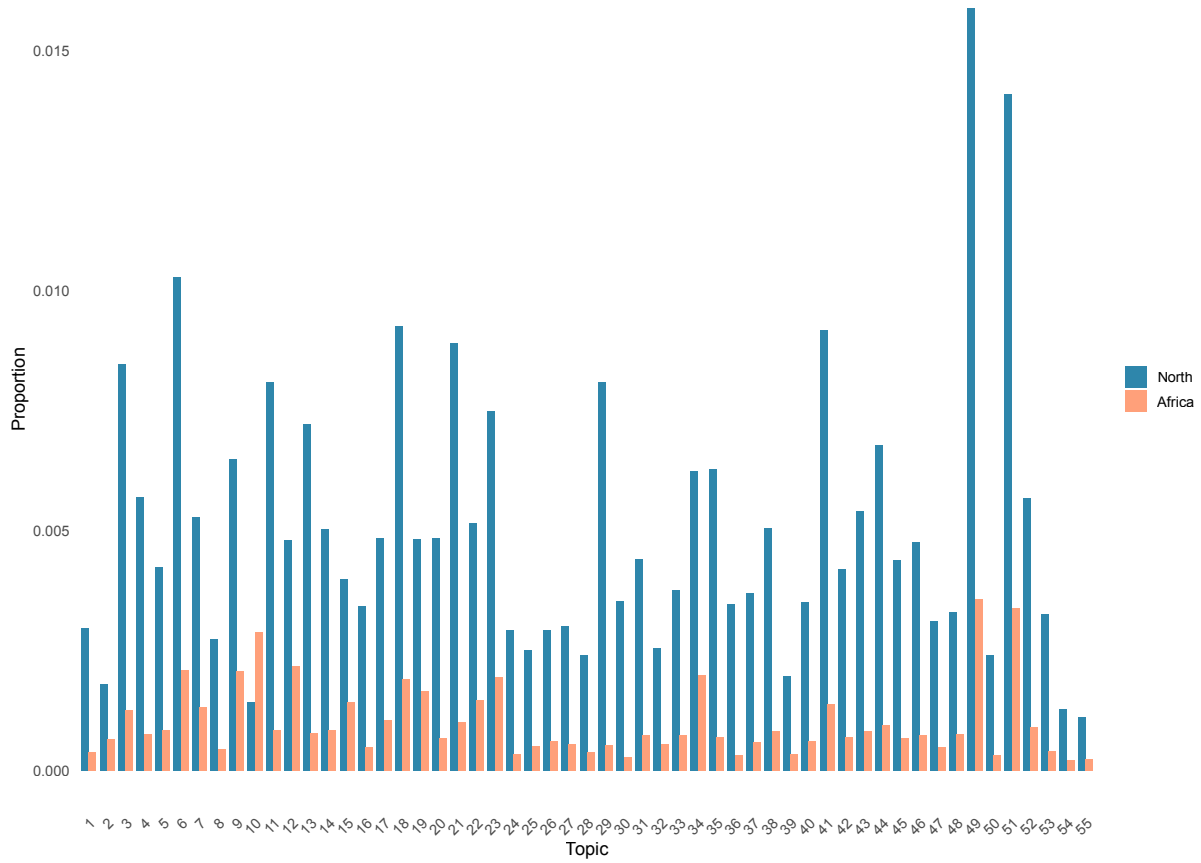
The imbalance is most visible in Latin America, where over one third publications involved North–South collaboration, followed by Africa at 27.51 per cent. Southeast Asia shows a comparatively lower, though still significant. These patterns point to enduring structural dependencies: Northern partnerships often provide access to funding, infrastructure, specialised expertise, and publication avenues, while Southern institutions leverage these collaborations strategically in fields, such as medical and health-related education, where their local contexts offer distinctive research advantages.

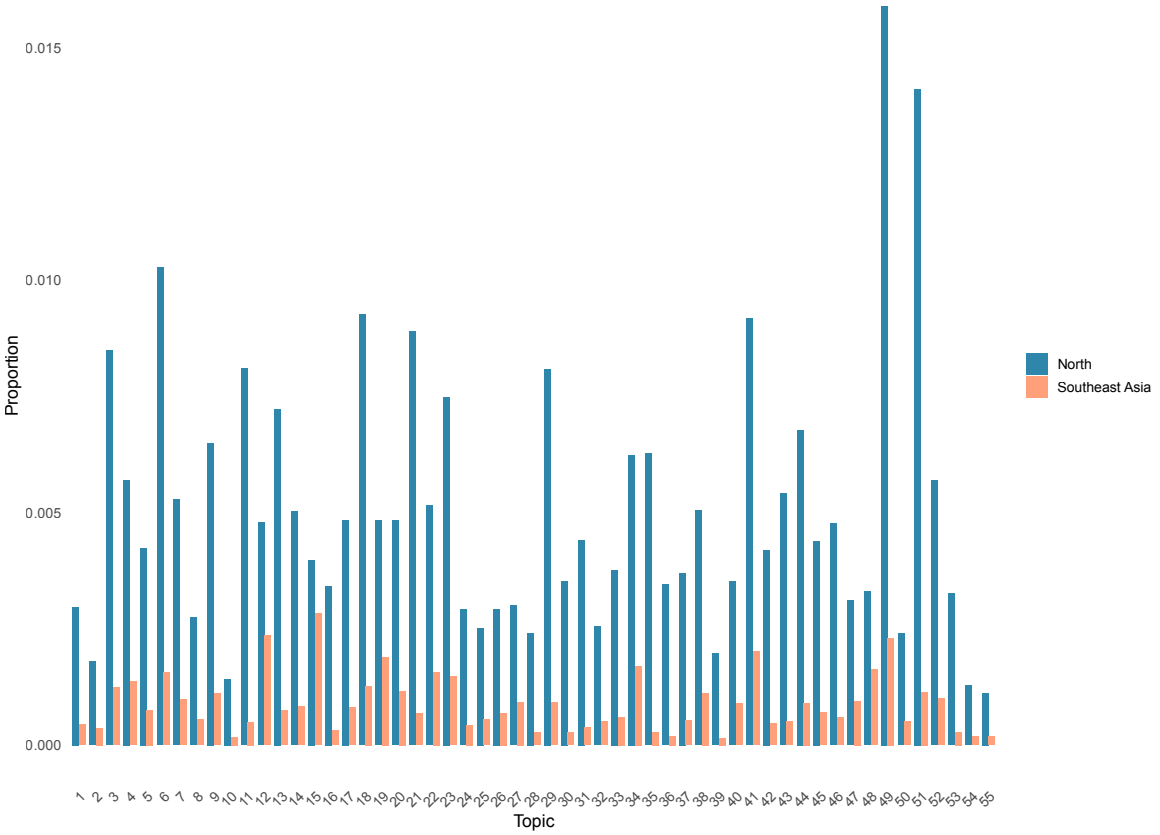
Only 608 scholars from the Global South were identified as active agents, those producing five or more publications within any rolling five-year period. This group comprises 215 scholars from Africa, 102 from Latin America, and 297 from Southeast Asia, amounting to less than three per cent of all Global South authors. The small size of this critical mass, together with the finding that more than four-fifths Global South authors published only a single paper, highlights the limited institutionalisation of higher education as a sustained research specialisation within many Global South systems.

Of the 252 key venues identified globally, 249 have published scholarship from the Global South, indicating broad engagement with international outlets. Regional patterns of venue preference, however, differ markedly. African scholars tend to publish in UK-based medical education journals as well as in South African regional outlets. Latin American researchers favour younger, regionally managed multilingual journals, many of which are indexed by SciELO. Southeast Asian scholars distribute their work across a diverse set of internationally originated journals, particularly those

focused on educational technology. These differentiated patterns reflect distinct strategies for balancing international visibility with regional relevance.

Topic comparison shows considerable convergence between Global South and Global North research foci, reflecting both the Global North's enduring epistemic influence and genuinely shared scholarly concerns (see Figure E2). In addition to the field-defining norms represented by T49 *Bridging Learning, Practice*, and Research and T51 *Theories and Discourse*, substantive common priorities appear in topics such as T3 *Students' Professional Preparation*, T6 *Student Experience on Campus*, and T41 *Classroom Instruction*. These themes address universal concerns related to labour market expectations, equity, and pedagogy.

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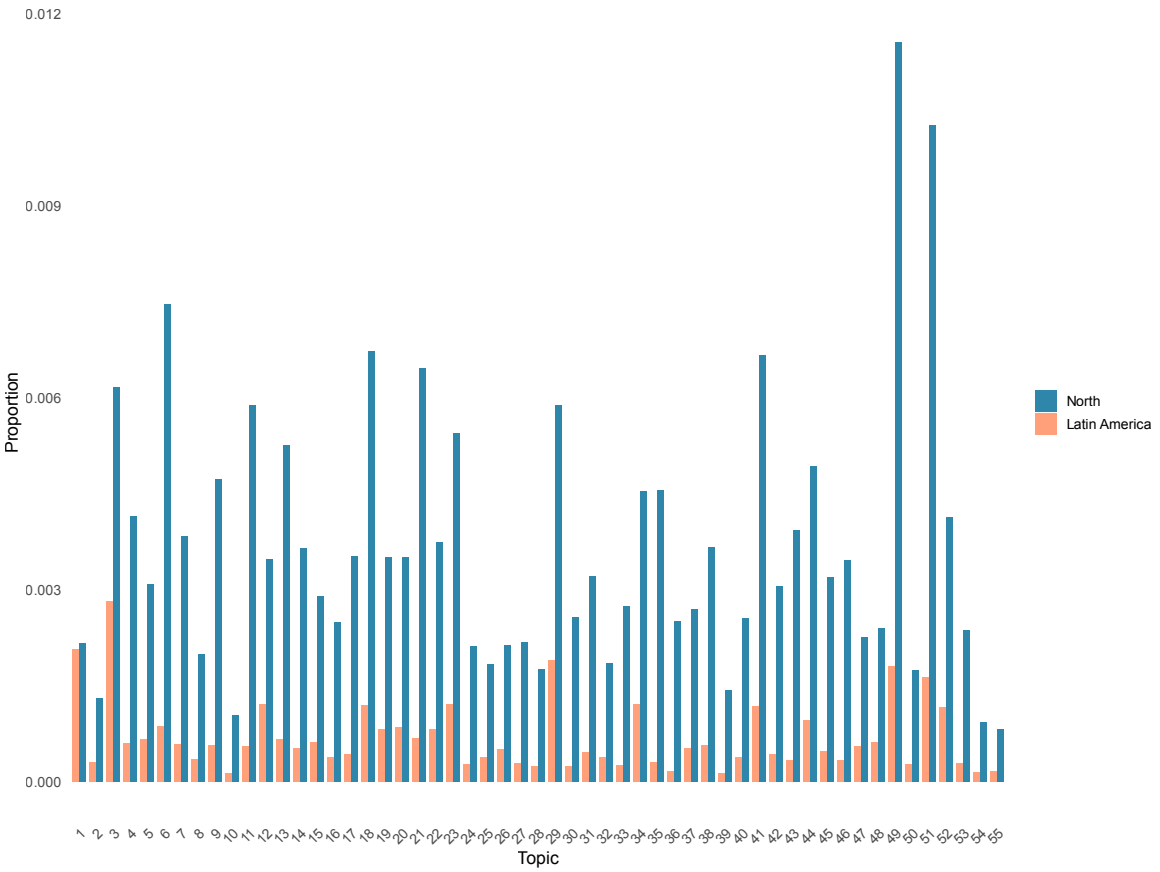
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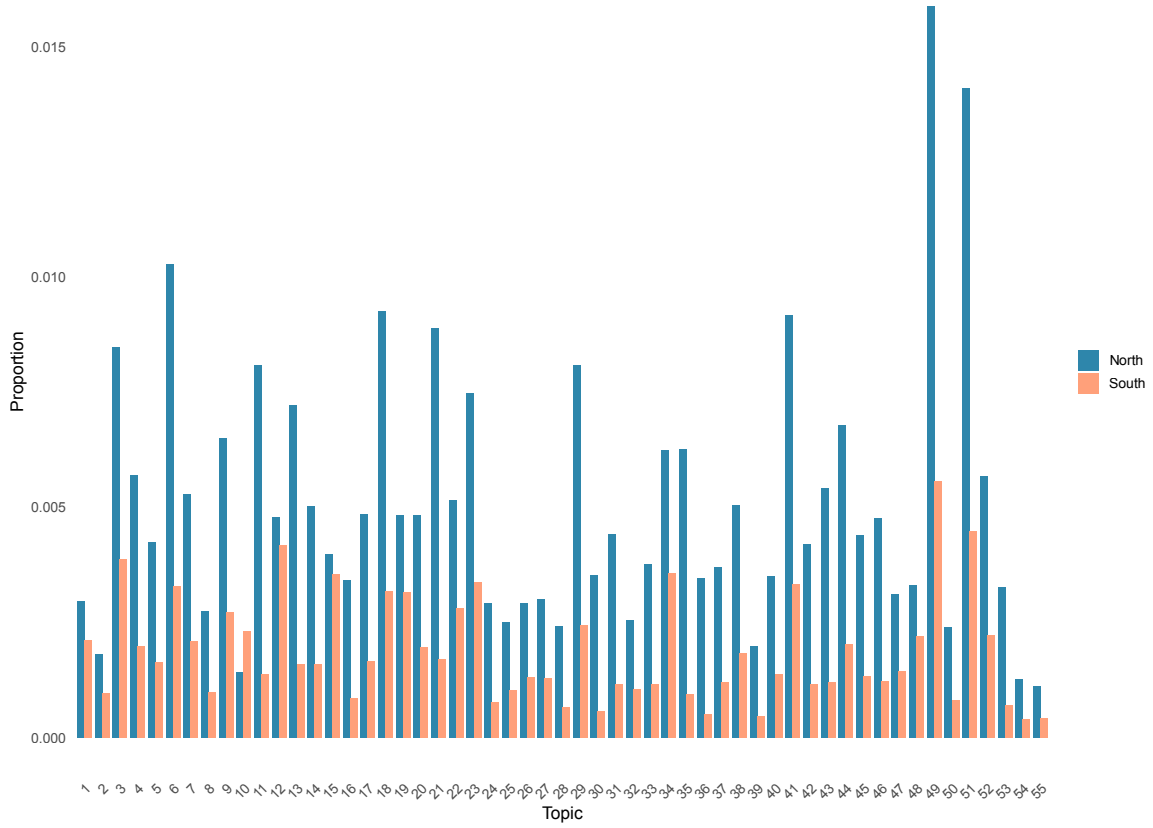

Figure E2. Topic Proportion Comparison between the Global South and the Global North

At the same time, the Global South exhibits distinct emphases. T12 *Methods_Statistics* highlights efforts to establish methodological legitimacy through quantitative approaches; T34 *Quality Assurance* reflects policy pressures arising from rapid system expansion; and T15 *Entrepreneurial Education* indicates strategic alignment with national development agendas. In contrast, the comparatively limited prominence of T21 *University Partnership and Outreach*, T11 *Student Retention and Pathways*, and T29 *Tertiary Chemistry Education* among Global South priorities illustrates how diverse socio-economic conditions, policy imperatives, and institutional environments shape regionally differentiated research trajectories.

Topic relative prevalence evolution analysis (see Figure E3 and E4) shows areas of both convergence and divergence between the Global South North. Nine of the fourteen leading Global South topics follow similar post-2005 patterns to those in the North. Their growth reflects the worldwide spread of digital pedagogies and student-centred values.

Five topics, however, move in different directions. T49 *Bridging Learning, Practice & Research* and T51 *Theories & Discourse* are declining in the Global South even though they are rising in the North. In contrast, T34 *Quality Assurance* and T41 *Classroom Instruction* are becoming more prominent in the Global South while interest in them decreases in the North. These increases reflect the pressures of system expansion and massification.

Overall, the Global South is not simply repeating Northern research trends. Instead, it is actively reshaping what is considered relevant and legitimate knowledge. This shift points to growing contextual differentiation and a slow but steady move toward greater epistemic autonomy.

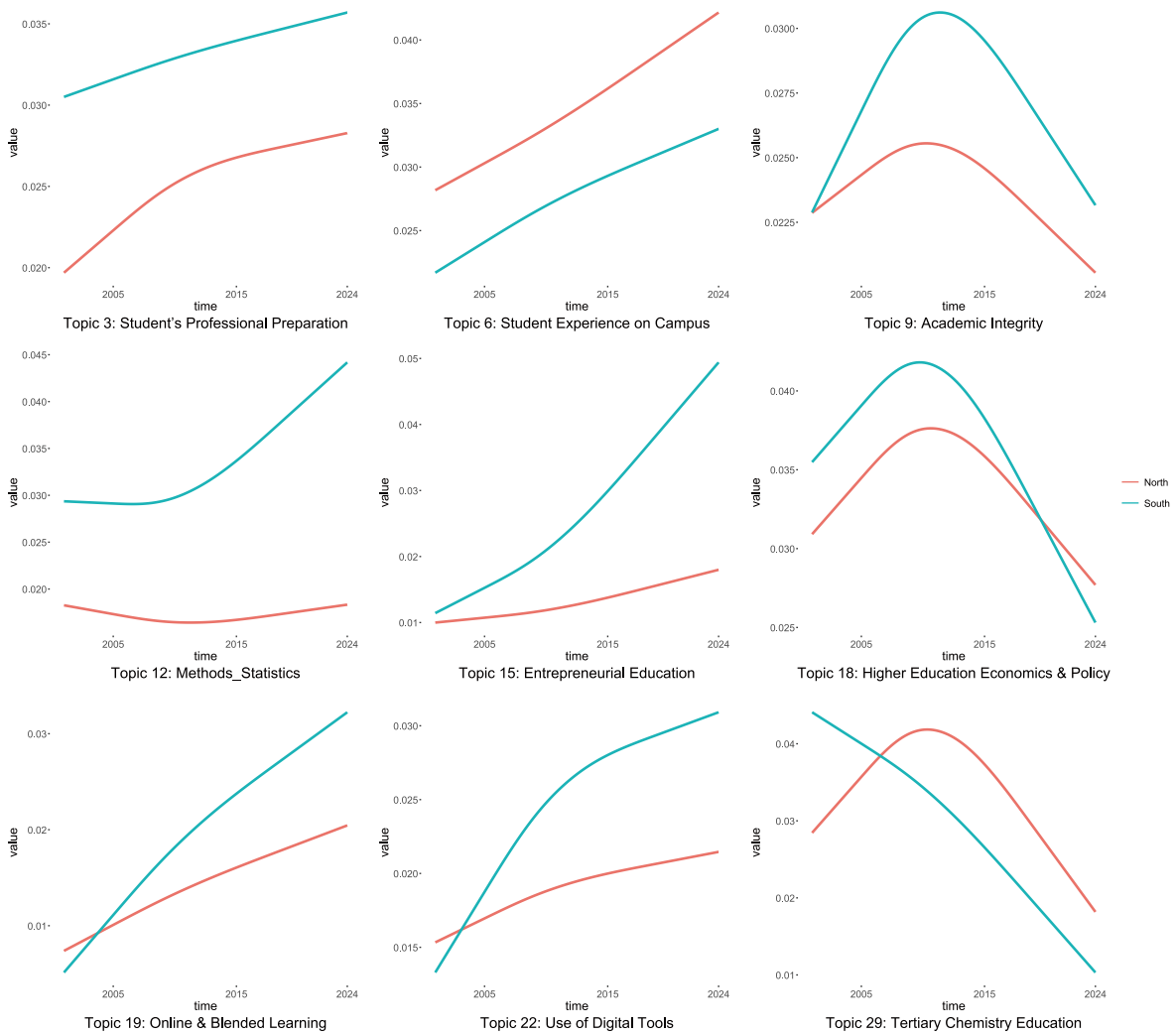

Figure E3. Convergent Evolutionary Trajectories of Top Quarter Topics in the Global South in Comparison with the Global North

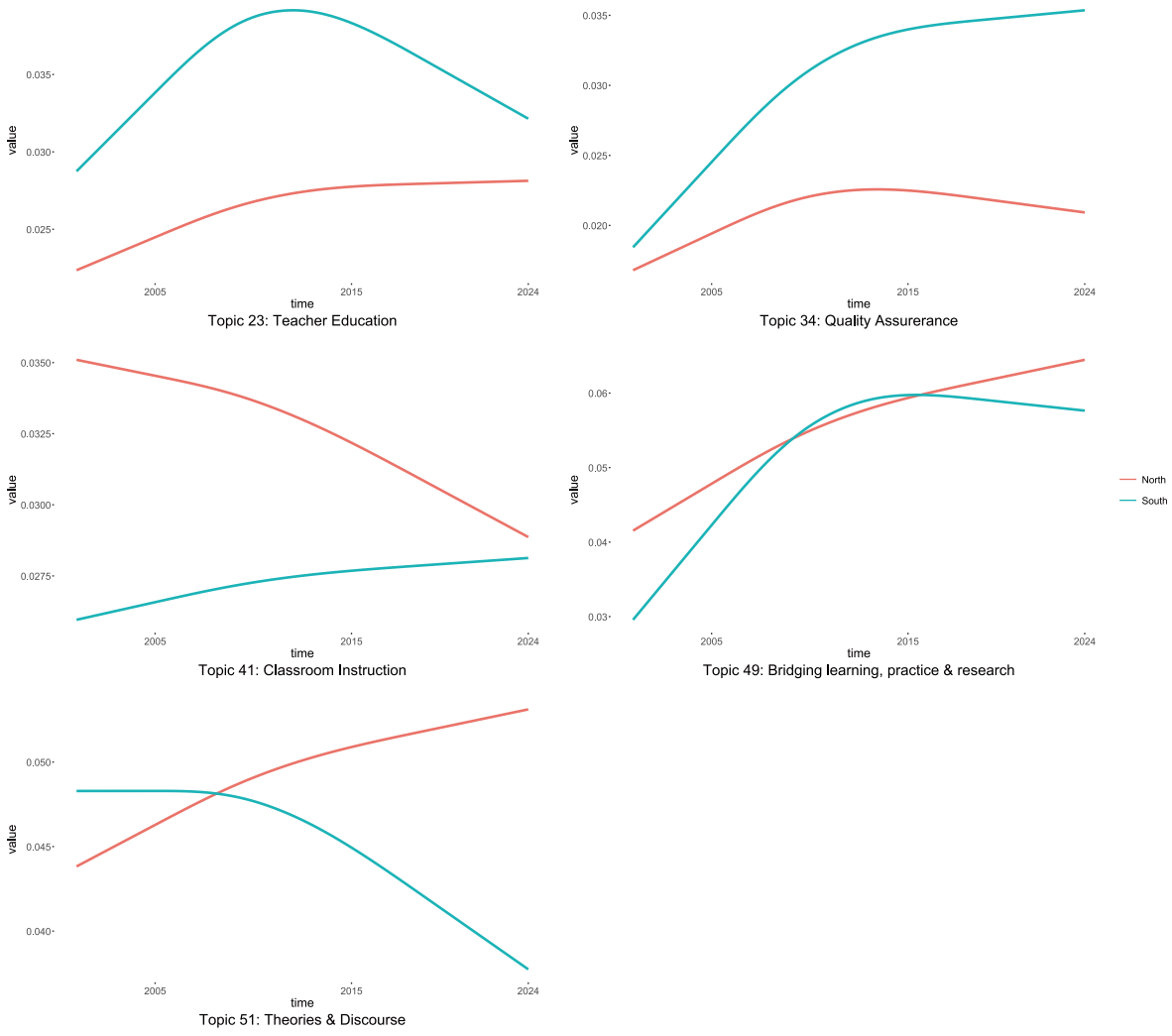

Figure E4. Divergent Evolutionary trajectories of Top Quarter Topics in the Global South in Comparison with the Global North

E4. HIGHER EDUCATION KNOWLEDGE PRODUCTION IN SOUTHEAST ASIA

Publication Output: Volume, Trends, and Collaboration

Southeast Asia's engagement with global higher education research follows a distinctive path of rapid growth and strategic alignment with modernisation goals. Over the 34 years covered in this report, the region produced 7,510 publications, which is about 3.52 per cent of the total indexed output. Although this share is relatively small, the research community has expanded quickly, especially since the mid-2000s. This rise parallels the region's broader economic transformation and the growing role of ASEAN as a platform for cooperation in higher education policy.

In Phase I (1991–2004), Southeast Asia contributed very little, producing fewer than six papers per year on average. During this period, the region remained loosely connected to global academic networks. The second phase (2005–2014) saw sharp acceleration, with annual output increasing more than twentyfold. National policy reforms drove this shift. Many countries prioritised world-class university development, research capacity building, and internationalisation. Malaysia and Singapore introduced performance-based funding and created targeted programmes to increase publication in internationally indexed journals (Mok, 2015). The phase III (2015–2024) is marked by steady expansion and diversification. By 2024, the region was producing more than 1,200 papers per year. This growth reflects the strengthening of domestic research systems and wider participation from ASEAN member states.

Collaboration patterns offer further insight into regional research strategies. Of the 7,510 publications analysed, 16.26 per cent were single-authored, placing Southeast Asia between Latin America and Africa. Co-authorship is dominated by within-region partnerships, which form the backbone of scholarly interaction and reflect a strong emphasis on building domestic and regional research capacity. Collaboration with the Global North, while present, is far more selective, indicating that Southeast Asian scholars engage internationally in a targeted manner that complements, rather than replaces, their regional networks.

Participation within the region is uneven (see Table E2). Malaysia, Indonesia, and Singapore contribute the majority of indexed outputs. Their stronger

research infrastructures, higher investment levels, and deeper global linkages explain this concentration. Thailand and Vietnam have expanded their contributions in recent years but still face capacity challenges. The Philippines occupies a middle position due to its long-standing English-language environment and historical ties to American higher education. By contrast, Cambodia, Laos, and Myanmar show very limited participation. These differences highlight persistent inequalities in research capacity and visibility across the region.

Table E2. Leading Countries by Publication Output in the Global South

Region	Country	Article Count	Proportion
Southeast Asia	Malaysia	2428	32.33%
	Indonesia	1617	21.53%
	Singapore	1244	16.56%
	Thailand	1053	14.02%
	Vietnam	679	9.04%
Latin America	Brazil	2492	42.83%
	Chile	1056	18.15%
	Colombia	1007	17.31%
	Argentina	475	8.16%
	Mexico	431	7.41%
Africa	South Africa	5226	61.15%
	Nigeria	645	7.55%
	Egypt	503	5.89%
	Ghana	464	5.43%
	Ethiopia	423	4.95%

Researcher Profiles and Participation

A total of 19,466 authors from Southeast Asia contributed to the 7,510 publications in our dataset. Of these, more than four-fifths authors published only once. Using our operational definition of active agents, we identified 297 Southeast Asian scholars who form the region's critical mass. They represent 1.59 per cent of all authors in the region, a share slightly below the global average of 2.04 per cent.

The disciplinary profile of active scholars in the region reflects a distinctive intellectual landscape. A clear majority have been trained in, or are currently affiliated with, faculties of education, underscoring the field's traditional academic home. Substantial representation also comes from engineering, followed by scholars with medical training. Economists form a noticeably larger share of the community than in the global pattern, where they make up fewer than seven per cent, highlighting Southeast Asia's strong orientation toward connecting higher education research with economic development and industry linkages. This tendency is further echoed in the prominence of the T15 *Entrepreneurial Education* topic. Southeast Asia also stands out for its stronger participation from engineering scholars, whose presence exceeds the global average. The shares of academics based in education and medical faculties closely mirror worldwide patterns.

Table E3. Disciplinary Background of Active Authors in the Global South

Discipline	Southeast Asia		Latin America		Africa		Global	
	Count	Proportion	Count	Proportion	Count	Proportion	Count	Proportion
Education	171	57.58%	40	39.22%	141	65.58%	5132	61.69%
Engineering	97	32.66%	36	35.29%	70	32.56%	2077	25%
Medical	77	25.93%	11	10.78%	31	14.42%	2119	25.47%
Economy	31	10.44%	4	3.92%	14	6.51%	557	6.70%
Total	297	/	102	/	215	/	8319	/

The geographical distribution of active agents in Southeast Asia shows strong institutional concentration (see Table E4). Malaysian universities host a substantial share of active scholars, with Universiti Malaya, Universiti Sains Malaysia, Universiti Putra Malaysia, and Universiti Teknologi Malaysia collectively accounting for 67 active agents. Singapore's two research-intensive universities—Nanyang Technological University and the National University of Singapore—together host 66 active scholars. In Indonesia, research capacity is concentrated in Universitas Indonesia and Universitas Negeri Malang. Thailand's Mahidol University hosts seven active scholars, and the University of Santo Tomas in the Philippines hosts a further two. Together, these institutions account for more than half of the region's 297 active scholars.

This high concentration may indicate uneven research funding and infrastructure across Southeast Asian countries. It also relates to differences in English-language proficiency, levels of international publishing experience, and the long-standing advantages enjoyed by Singapore and Malaysia in building research-intensive university systems. The dominance of elite institutions highlights their success in cultivating active research communities, but it also underscores the need for broader capacity-building across the region's diverse national contexts.

Table E4. Leading Universities Hosting Active Scholars in the Global South by Region

Region	Affiliation	Count	Country
Southeast Asia	Nanyang Technol Univ	46	Singapore
	Univ Malaya	24	Malaysia
	Univ Sains Malaysia	23	Malaysia
	Natl Univ Singapore	20	Singapore
	Univ Negeri Malang	14	Indonesia
	Univ Putra Malaysia	12	Malaysia
	Univ Teknol Malaysia	8	Malaysia
	Univ Indonesia	7	Indonesia
	Mahidol Univ	7	Thailand
	Univ Santo Tomas	2	Philippines
Latin America	Pontificia Univ Catolica Chile	10	Chile
	Univ Los Andes	8	Colombia
	Univ Chile	8	Chile
	Univ Andes	8	Colombia
	Univ Fed Ceara	5	Brazil
	Univ Andres Bello	5	Chile
	Tecnol Monterrey	3	Mexico
	Univ Desarrollo	3	Chile
	Univ Tarapaca	3	Chile
	Univ Nacl La Plata	1	Argentina
Africa	Univ KwaZulu Natal	24	South Africa
	Stellenbosch Univ	19	South Africa
	Univ Johannesburg	15	South Africa
	Univ Cape Town	14	South Africa
	North West Univ	13	South Africa
	Univ Witwatersrand	13	South Africa
	Univ Western Cape	12	South Africa
	Univ Pretoria	10	South Africa
	Univ Free State	10	South Africa
	Cape Peninsula Univ Technol	9	South Africa

Knowledge Dissemination Venues

Southeast Asian scholars disseminate their higher education research through a distinctive mix of publication venues that reflects both global engagement and regional priorities. Of the 252 key venues identified worldwide, authors from the region have published in 236. This extensive reach shows

that Southeast Asia places strong emphasis on international visibility and active participation in global academic networks.

Table E5 presents the top ten venues for publishing Southeast Asian higher education research, ranked by publication volume. Journals focusing on educational technology and digital learning appear prominently in this list. The International Journal of Instruction, Education and Information Technologies, and the I*nternational Journal of Emerging Technologies in Learning* together account for 8.6 per cent of the region's total output.

Table E5. Leading Journals Publishing Higher Education Research from Southeast Asia

	Journal Title	Number of Publications	Publisher Location
1	International Journal of Instruction	293	Turkey
2	Education and Information Technologies	190	United States
3	International Journal of Emerging Technologies in Learning	177	Austria
4	BMC Medical Education	168	United Kingdom
5	Cogent Education	149	United Kingdom
6	Journal of Technical Education and Training	146	Malaysia
7	Journal of Applied Research in Higher Education	144	United Kingdom
8	Journal of Chemical Education	129	United States
9	International Journal of Early Childhood Special Education	124	Turkey
10	IJOLE-International Journal of Language Education	103	Indonesia

Two regionally managed journals appear among the top ten publication venues for Southeast Asian scholars: the *Journal of Technical Education and Training* from Malaysia and *IJOLE – International Journal of Language Education* from Indonesia. Their prominence shows that locally managed outlets can gain international visibility. The Malaysian journal reflects the region's strong focus on technical and vocational education and skills development, while *IJOLE* addresses multilingual education needs central to Southeast Asia.

Medical education journals hold a strong presence. *BMC Medical Education* ranks fourth with 168 publications, reflecting sustained attention to clinical training and health professions pedagogy. The *Journal of Chemical Education* remains a significant outlet, highlighting long-standing chemistry education research communities in Malaysia, Thailand, and Indonesia.

Research Agenda

The research agenda of Southeast Asian higher education scholars shows a strong developmental orientation focused on system modernisation, quality improvement, and economic alignment (see Table E6). While the region engages with globally prominent topics, it also demonstrates several distinctive emphases.

Table E6. Top-Quartile Topics in Higher Education Research in Southeast Asia

Topic Number	Topic Label	Average Proportion
15	Entrepreneurial Education	5.79
12	Methods_Statistics	4.83
49	Bridging learning, practice & research	4.72
41	Classroom Instruction	4.11
19	Online & Blended Learning	3.88
34	Quality Assurerance	3.48
48	EFL Education	3.33
22	Use of Digital Tools	3.23
6	Student Experience on Campus	3.19
23	Teacher Education	3.02
4	Student's Motivation & Academic Achievement	2.81
18	Higher Education Economics & Policy	2.6
3	Student's Professional Preparation	2.54
20	Methods_Scale	2.38

T15 *Entrepreneurial Education* is the region's most prominent topic and more than triple the Global North average (1.81%). This emphasis reflects regional strategies to address youth unemployment, support economic diversification, and promote innovation-driven growth. Policies in Singapore, Malaysia, and Thailand have encouraged universities to cultivate entrepreneurial skills and mindsets, positioning institutions as engines of economic development.

T34 *Quality Assurance* is another major priority, reflecting system expansion and ongoing debates around governance, institutional standards, and accountability. This contrasts with more established systems where quality frameworks are already embedded. The prominence of this topic aligns with a broader global shift from macro-level analysis to institutional processes, though this shift is especially pronounced in Southeast Asia.

Methods-focused topics, T12 *Methods_Statistics* and T20 Methods_Scale, together account for 7.21 per cent, the highest share among Global South regions. This reflects aspirations for methodological rigour aligned with global standards and the influence of research evaluation systems that prioritise measurable outcomes. The strong focus on scale development and validation may indicate active efforts to build contextually appropriate measurement tools.

T48 *EFL Education* is another distinctive priority. English proficiency is central to economic competitiveness and regional integration, reinforced by national language policies and ASEAN's use of English as its working language. This stands apart from Latin America and Francophone Africa, where local languages retain greater scholarly authority.

Despite its distinctive emphases, Southeast Asia also follows several global trends. T22 *Digital Tools*, T19 *Online & Blended Learning*, and T41 *Classroom Instruction* form a major group of topics. Together, they reflect the global move toward digital transformation. They also respond to regional needs, such as dispersed geography and linguistic diversity.

Student-related themes show a similar pattern. T6 *Student Experience* on Campus, T4 *Student Motivation & Achievement*, and T3 *Student Professional Preparation* are all prominent. In Southeast Asia, these topics often highlight first-generation students, transition challenges, and employability. These concerns arise from the rapid massification of higher education in the region.

Overall, Southeast Asian higher education research demonstrates a coherent, applied, and problem-oriented agenda aligned with national development goals. Its strong focus on quantitative methods, quality assurance, entrepreneurship, and digital transformation reflects deliberate policy choices aimed at economic competitiveness and modernisation. Rather than mirroring Global North models, the region shows strategic selectivity, engaging with global standards while pursuing contextually grounded questions.

E5.
HIGHER EDUCATION KNOWLEDGE PRODUCTION IN LATIN AMERICA

Publication Output: Volume, Trends, and Collaboration

Latin America has limited visibility in internationally indexed higher education research. Across the period examined, the region contributed 5,819 publications to WoS, accounting for only 2.73 per cent of global output. This figure significantly understates regional scholarship, as a large share of Latin American research circulates through Spanish- and Portuguese-language journals, institutional repositories, and regional indexing systems which are not captured by WoS.

In Phase I Latin America's WoS-indexed output averaged fewer than eight papers per year, reflecting the dominance of local publication circuits rather than the absence of research. The Phase II saw moderate growth, with output reaching about 75 papers annually by 2014. This rise aligned with the shift in national evaluation systems that encouraged international publishing, and increased involvement in international networks such as those supported by EU–LAC mobility programmes (Sanahuja, 2013). The phase III shows sharper growth, exceeding 495 papers yearly by 2024, though the region remains underrepresented relative to its population, economy, and higher education system size.

Importantly, WoS captures only one dimension of Latin America's scholarly landscape. The region has built strong alternative infrastructures centred on open access, linguistic diversity, and regional relevance. By 2024, SciELO indexed more than 1,800 journals, including over 200 in education, while Redalyc provided open access to more than 1,300 journals across Latin America, Spain, and Portugal. These platforms embody a commitment to knowledge as a public good rather than a commodity, operating under values distinct from impact factor–driven publishing.

Internationally visible output is highly concentrated (see Table E2). Brazil dominates with 2,492 papers, nearly half of the region's total, supported by its large academic system and evaluation policies favouring WoS-indexed publication. Chile and Colombia form a strong second tier, followed by Argentina and Peru. Mexico is comparatively underrepresented in this dataset despite its national size.

Given this landscape, Latin American scholars often

adopt dual publication strategies: publishing in regional platforms to reach domestic audiences while selectively contributing to WoS-indexed journals for institutional recognition and participation in global debates. This approach reflects what Beigel (2013) describes as "dependent autonomy", a stance that combines engagement with global systems and commitment to regionally grounded knowledge production.

Researcher Profiles and Participation

A total of 17,615 Latin American authors contributed to the 5,819 WoS-indexed publications in our dataset. Most of them published only once, and only a small group met our definition of active agents. We identified 102 active agents. Although this proportion appears low, it largely reflects the limited coverage of Latin American scholarship in WoS. When regional platforms such as SciELO are included, the community of sustained higher education researchers is expected to become considerably larger.

The geographical distribution of active agents in Latin America also shows clear institutional concentration (see Table E4). Chile and Colombia host the largest clusters, with Pontificia Universidad Católica de Chile, Universidad de Chile, Universidad Andrés Bello, and Universidad de Tarapacá together contributing a significant share of active scholars, and Universidad de los Andes and Universidad de los Andes (Colombia) each hosting eight. Brazil's Universidade Federal do Ceará adds a smaller but notable group, while Mexico's Tecnológico de Monterrey and Argentina's Universidad Nacional de La Plata contribute only a few active agents. Taken together, these institutions account for over half of Latin America's active higher education researchers captured by WoS.

The disciplinary profiles of Latin America's active scholars diverge noticeably from global and regional norms (see Table E3). Fewer than half are based in faculties of education, highlighting a more interdisciplinary research culture than in Southeast Asia or Africa. Engineering scholars constitute a substantial share, reflecting strong traditions in technical and applied fields. Medical affiliations appear less frequently than in other regions, and links to economics and management are particularly limited.

Knowledge Dissemination Venues

Latin American scholars display the most distinctive publication pattern among the three Global South regions, favouring regionally managed and multilingual journals while engaging selectively with mainstream international outlets. Of the 252 global key venues, Latin American authors have published in 224 (88.89%), showing both broad international engagement. Table E7 lists the top ten WoS-indexed venues for publishing higher education research from Latin America. Three of these venues are regionally managed—*Revista Ibero-Americana de Estudos em Educação, Revista Conrado*, and *Profile*. Two publish in multilingual or non-English formats. Another journal, *HOW*, although managed from the United Kingdom, also accommodates local languages. Together, these four venues account for 508 papers, or 8.73 per cent of Latin America's WoS-indexed output. Their distribution across Brazil, Cuba, and Colombia demonstrates a stronger regional publishing infrastructure than that found in Southeast Asia or Africa.

Table E7. Leading Journals Publishing Higher Education Research from Latin America

	Journal Title	Number of Publications	Publisher Location	Primary Languages
1	Journal of Chemical Education	203	United States	English
2	Revista Ibero-American a de Estudos em Educação	161	Brazil	Portuguese, Spanish
3	Frontiers in Education	138	Switzerland	English
4	Revista Conrado	138	Cuba	Spanish
5	Profile-issues in Teachers Professional Development	119	Colombia	English
6	European Journal of Physcis	107	United Kingdom	English
7	Education Sciences	103	Switzerland	English
8	BMC Medical Eucation	99	United Kingdom	English
9	International Journal OF Sustainability in Higher Education	97	United Kingdom	English
10	How-A Colombia Journal for Teachers of English	90	United Kingdom	Portuguese, Spanish

This regional prominence aligns with Latin America's long-standing commitment to epistemic autonomy. Regional journals allow scholars to publish in Spanish and Portuguese, maintain open-access principles, and prioritise regional relevance. These regionally managed outlets demonstrate that international visibility does not necessarily require Northern management or English-only publishing.

Disciplinary education journals also have strong presence. The *Journal of Chemical Education* ranks first, and the *European Journal of Physics* sixth, indicating substantial STEM education research, particularly in Brazil, Mexico, and Argentina. *BMC Medical Education* appears but is less dominant than in Southeast Asia or Africa. The *International Journal of Sustainability in Higher Education* reflects growing interest in environmental issues, consistent with regional debates on environmental justice and alternative development. Open-access multidisciplinary journals such as *Frontiers in Education* and *Education Sciences* also rank highly, although their article processing charge models pose potential financial barriers.

Research Agenda

Latin America's higher education research agenda is the most sociologically oriented and theoretically engaged among the Global South regions. Its intellectual foundations, shaped by dependency theory, critical pedagogy, and longstanding traditions of historical and social analysis, give the region a distinctive thematic profile (see Table E8). While Latin American scholars work across the full global topic spectrum, they consistently emphasise reflexive scholarship, social purpose, and epistemic autonomy.

Table E8. Top-Quartile Topics in Higher Education Research in Latin America

Topic Number	Topic Label	Average Proportion
T3	Student Professional Preparation	7.50
T1	Historical & Bibliometric Analysis of Scholarship	5.52
T29	Tertiary Chemistry Education	5.05
T49	Bridging Learning, Practice & Research	4.80
T51	Theories & Discourse	4.36
T12	Methods_Statistics	3.23
T23	Teacher Education	3.23
T34	Quality Assurance	3.22
T18	Higher Education Economics & Policy	3.17
T41	Classroom Instruction	3.15
T52	Engineering Education	3.09
T44	Student Knowledge Acquisition	2.55
T6	Student Experience on Campus	2.33
T20	Methods_Scale	2.27

A defining feature is the prominence of T1 *Historical & Bibliometric Analysis* of Scholarship. This topic occupies an unusually central position in Latin American research, reflecting a deep commitment to examining how knowledge is produced, circulated, and recognised. T3 *Student Professional Preparation* is another leading theme. Yet its meaning in Latin America differs markedly from how it appears in other Global South regions. Rather than focusing primarily on employability or entrepreneurial mindsets, T3 research foregrounds formación: the cultivation of ethical commitment, social responsibility, and critical awareness. This Freirean inflection positions universities as spaces for nurturing socially engaged professionals.

Latin American scholarship also exhibits strong engagement with T51 *Theories & Discourse*. Work in this area frequently draws on regional thinkers such as Paulo Freire, Boaventura de Sousa Santos, Enrique Dussel, and indigenous epistemologies. Rather than importing theoretical models from the Global North, Latin American researchers often develop or adapt conceptual tools grounded in their own historical and cultural contexts.

A second distinctive cluster centres on disciplinary education, especially T29 *Tertiary Chemistry Education* and T52 *Engineering Education*. These topics highlight the region's strong disciplinary research traditions and the vibrancy of STEM education communities in Brazil, Mexico, and Argentina.

Methodologically, Latin American higher education research displays notable pluralism. While quantitative work within T12 *Methods_Statistics* and T20 *Methods_Scale* is present, it sits alongside ethnography, participatory action research, historical studies, and case-based inquiry. This diversity reflects commitments to contextual understanding and participant voice.

Taken together, Latin America's higher education research agenda is the most intellectually distinctive and epistemologically self-conscious among the Global South regions. Its emphasis on reflexive scholarship (T1), socially grounded professional formation (T3), regionally rooted theorisation (T51), and disciplinary depth (T29, T52) demonstrates a tradition that positions education as inherently political and socially engaged.

E6.
HIGHER EDUCATION KNOWLEDGE PRODUCTION IN AFRICA

Publication Output: Volume, Trends, and Collaboration

Africa's engagement with global higher education research presents the most complex and uneven patterns among the three Global South regions. Across the study period, the continent contributed 8,546 publications indexed in WoS, representing the largest overall share of Global South, yet this figure conceals significant internal disparities, distinctive collaboration practices, and a strategic positioning shaped by long-standing structural constraints.

In phase I publication levels were minimal. This reflected the deep legacies of colonialism, weak research infrastructure, resource scarcity, brain drain, and political instability, which constrained academic development across much of the continent. Higher education research remained emergent, with scholarly attention largely focused on primary and secondary education. The phase II saw marked expansion. Growing political stability in key countries, South Africa's rise as a research leader, increased recognition of higher education's importance, and capacity-building investments by governments and international organisations all contributed to a rapid increase in scholarly output. This period marked Africa's entry into global higher education debates in a more sustained way.

The phase III shows continued and accelerated growth. South Africa's leading role remains central, but new research activity has emerged from Nigeria, Egypt, Ghana, and Ethiopia. Expanded doctoral training across the continent and widening international collaboration networks have helped cultivate a larger cohort of African-based scholars contributing to global research platforms.

Collaboration patterns reveal further structural dynamics (see Table E1). Africa has the highest proportion of single-authored publications among the Global South regions, and a large share of multi-authored work involves North–South partnerships. This heavy reliance on Northern collaborators may indicate both structural constraints and strategic choices, especially in fields such as medical education where international funding and laboratory infrastructure are critical. In contrast, intra-African collaboration and South–South partnerships account for only a small share of publications. Linguistic fragmentation, scarce funding for intra-African mobility, weak regional research networks, and enduring incentives to partner with Northern institutions all constrain continental collaboration. The dominance of South African publishers may inadvertently reinforce outward-looking orientations, as South African scholars often collaborate more with Northern partners than with colleagues elsewhere in Africa.

Participation in WoS-indexed publication remains highly concentrated geographically within Africa (See Table E2). South Africa alone accounts for over three-fifths of the continent's higher education publications in our dataset, a dominance that has actually increased over time. Nigeria, Egypt, Ghana and Ethiopia contributes less than 10 per cent, respectively. These five countries collectively represent about 85 per cent of African higher education research indexed in WoS. The remaining 49 African countries contribute only modestly. Central and Francophone West Africa, in particular, remain under-represented within WoS despite having active higher education sectors.

Language further shapes patterns of representation. Anglophone countries, especially South Africa, Kenya, Nigeria, and Ghana, appear prominently due to the linguistic advantages of publishing directly in English. By contrast, Francophone scholarship often circulates in separate regional ecosystems (countries such as Senegal, Cameroon, Côte d'Ivoire, and the Democratic Republic of Congo), including long-established Francophone publishing networks and platforms associated with the Agence Universitaire de la Francophonie. Lusophone African systems (Angola, Mozambique, Guinea-Bissau, Cape Verde) similarly connect more strongly to Brazilian and Portuguese networks than to Anglophone publication circuits.

For these reasons, WoS-indexed "African higher education research" largely reflects Anglophone output, particularly from South Africa, with only partial visibility of Francophone, Lusophone, and indigenous knowledge traditions. Any interpretation of continental patterns must therefore recognise that globally indexed data capture only a segment of Africa's diverse higher education scholarship.

Researcher Profiles and Participation

A total of 18,725 authors from Africa contributed to the 8,546 publications in our dataset, constituting the largest author pool among the three Global South regions examined. Of these, nearly 85 per cent authors published only once, consistent with patterns observed in other regions and reflecting higher education research's interdisciplinary character and the episodic engagement of scholars from other fields.

We identified 215 active scholars in Africa. This group represents just over one per cent of primary-affiliated African authors. Yet this figure conceals striking geographical concentration: nearly two-thirds active agents are based in South Africa, with far smaller clusters in Nigeria, Ghana, and Ethiopia, and only a handful spread across the rest of the continent.

South Africa's dominance is indeed obvious across every dimension of African higher education research. Of the 8,546 publications identified, South Africa alone accounts for more than 5,200, an extraordinary share that far exceeds contributions from all other African countries, with Nigeria a distant second. This pattern extends to the institutional level as well: all of the top ten universities host most active scholars in Africa are located in South Africa (see Table E4).

Outside South Africa, active research communities are concentrated in a small number of flagship universities, including the University of Ghana, Makerere University in Uganda, and several Ethiopian institutions such as Hawassa University and Bahir Dar University. Even so, their combined output remains modest when compared with South Africa's extensive institutional ecosystem. This extreme concentration reflects South Africa's historical advantage in research infrastructure, much of which survived apartheid and expanded after 1994, contrasted with chronic under-resourcing across many other African systems.

The disciplinary backgrounds of Africa's active scholars also reveal distinctive patterns shaped by continental development priorities (see Table E3). Affiliations with education faculties account for nearly two-thirds of all active scholars, the highest proportion among the Global South regions and notably above the global average. This reflects the strong institutionalisation of education research,

particularly in South Africa and Kenya. Engineering backgrounds form another significant group, aligning with broader Global South patterns and exceeding the global norm, a trend that corresponds to the continent's emphasis on infrastructure development and technological capacity. Medical affiliations, while present, remain more limited compared with global and Southeast Asian patterns, though they exceed those observed in Latin America. Representation from economics and management faculties is modest but sits between the stronger business orientation seen in Southeast Asia and the minimal engagement evident in Latin America.

Knowledge Dissemination Venues

African scholars' choice of publication venues shows a distinctive pattern marked by strong concentration in South African–managed journals, selective engagement with medical education outlets, and limited diversification across the broader international publishing landscape. African authors have published in 230 of the 252 key venues identified globally. Yet this breadth masks the overwhelming dominance of South Africa's publishing infrastructure.

As shown in Table E9, six of the top ten venues for African higher education research are managed by South Africa. These six outlets collectively account for nearly one-fifth of all African publications in our dataset, a degree of concentration not seen in any other region. The *South African Journal of Higher Education (SAJHE)* alone contributes a substantial share of the continent's total output and has achieved notable international visibility. Even so, SAJHE functions largely as a national journal, with most articles focused on South African issues and only occasional attention to wider continental contexts. The other South African journals in the top tier follow similar patterns, prioritising South African and southern African perspectives.

The absence of journals from other African regions in the top ten is striking. No major outlets from West, East, North, or Central Africa appear, despite the presence of active higher education systems across these regions. Francophone Africa, in particular, remains invisible in WoS-indexed venue rankings: countries such as Senegal, Cameroon, and Côte d'Ivoire host longstanding academic communities, yet no French-language education journals have attained WoS visibility. This gap reflects not a lack of scholarly activity but the structural marginalisation of non-Anglophone African knowledge production.

Table E9. Leading Journals Publishing Higher Education Research from Africa

	Journal Title	Number of Publications	Publisher Location
1	South African Journal of Higher Education	649	South Africa
2	BMC Medical Education	321	United Kingdom
3	Cogent Education	236	United Kingdom
4	Africa Education Review	229	South Africa
5	South African Journal of Education	199	South Africa
6	International Journal OF Educational Sciences	177	South Africa
7	Journal of Education	170	South Africa
8	Education as Change	166	South Africa
9	Education and Information Technologies	154	United States
10	Higher Education	136	Netherlands

This concentration carries contradictory implications. On the one hand, South African journals show that African-managed outlets can gain international recognition, offer accessible publication pathways for scholars across the continent, and foreground Africa-specific priorities without reliance on Northern editorial control. On the other hand, the degree of concentration means that "African" higher education research in WoS is, in practice, largely South African research, reproducing unequal dynamics within the continent itself.

Beyond South African journals, *BMC Medical Education* ranks second and highlights Africa's strategic position within global health research. Africa's disease burden and epidemiological contexts create opportunities for scholars to generate knowledge on medical training in resource-constrained environments and on health workforce development, domains in which African scholarship often leads rather than follows global debates.

Cogent Education also features prominently, reflecting the appeal of open-access venues for scholars who face barriers when submitting to highly selective journals. The presence of *Education and Information Technologies* suggests growing engagement with digital learning, with African research often highlighting challenges related to unstable electricity, limited connectivity, and high data costs. It is also notable that *Higher Education*, a flagship journal in the field, appears among the top ten venues, demonstrating African scholars' capacity to publish in prestigious global outlets.

The African publishing landscape presents a paradox: strong engagement with international venues and impressive national capacity in South Africa, combined with limited regional diversification and under-representation of non-South African and non-Anglophone scholarship. Unlike Latin America or Southeast Asia, where multiple countries sustain regionally visible journals, Africa's WoS-indexed infrastructure remains overwhelmingly South African. This pattern raises important questions about continental representation, linguistic inclusivity, and the visibility pathways available to scholars across Africa's diverse higher education systems.

Research Agenda

Africa's higher education research agenda presents the most explicitly political and transformative thematic profile among the three Global South regions. It is shaped by post-colonial critique, strategic engagement in global health research, and sustained attention to system-building challenges under resource constraints (see Table E10).

Table E10. Top-Quartile Topics in Higher Education Research in Africa

Topic Number	Topic Label	Average Proportion
T49	Bridging Learning, Practice & Research	6.45
T51	Theories & Discourse	6.13
T10	Decolonisation	5.20
T12	Methods: Statistics	3.95
T6	Student Experience on Campus	3.78
T9	Academic Integrity	3.74
T34	Quality Assurance	3.61
T23	Teacher Education	3.53
T18	Higher Education Economics & Policy	3.47
T19	Online & Blended Learning	2.98
T22	Use of Digital Tools	2.66
T15	Entrepreneurial Education	2.60
T41	Classroom Instruction	2.52
T7	Applied Curriculum & Graduate Skills	2.38

T10 *Decolonisation* is the most distinctive feature of African higher education research. It accounts for 5.20 per cent of African publications, nearly eight times the global average, fourteen times the share observed in Southeast Asia, and almost three times that of Latin America. This prominence reflects a sustained intellectual and political project unique to the continent. African scholarship on T10 encompasses curricular reform that centres African histories and philosophies; institutional transformation that interrogates colonial governance structures; epistemological reconstruction that validates African knowledge systems, including Ubuntu; and critical analysis of research politics that question who defines agendas and who benefits from knowledge produced about Africa.

The strength of T10 is rooted in the continent's uneven experiences of political independence, the acute visibility of epistemological marginalisation in inherited curricula. Critical social movements, such as *Rhodes Must Fall* and *Fees Must Fall* in South Africa between 2015 and 2017, also propel decolonisation

to the forefront of academic debate. South Africa contributes roughly 71 per cent of all publications in this topic, reflecting both its broader research dominance and the particular intensity of transformation debates in the post-apartheid period.

T49 *Bridging Learning, Practice & Research* ranks first at 6.45 per cent. African research in this area places particular emphasis on practice-based learning, work-integrated learning, and community engagement. These concerns speak directly to structural unemployment, the need to improve graduate employability, and the broader question of higher education's relevance to Africa's development priorities. They also reinforce calls for universities to act as engaged institutions connected to community needs rather than operating as isolated academic enclaves.

T51 *Theories & Discourse* ranks second at 6.13 per cent, a level well above Southeast Asia and broadly comparable to Latin America. African scholarship within this topic shows strong engagement with post-colonial theory, critical race theory, African philosophy, and feminist epistemologies. This emphasis distinguishes Africa from Southeast Asia's more applied orientation. It reflects an understanding that theory-building is central to epistemic autonomy and challenges long-standing hierarchies in which Northern scholars construct theory while Southern scholars are positioned merely as empirical contributors.

Several system-development topics show heightened prominence in the African context. T34 *Quality Assurance* reflects ongoing efforts to establish robust quality mechanisms within rapidly expanding systems and in response to the growth of private higher education. T9 *Academic Integrity* also features strongly and sits well above the global average, signalling rising concern about plagiarism and questionable research practices as systems massify and publication pressures intensify. T18 *Higher Education Economics & Policy* captures debates around funding constraints, private sector expansion, and the tension between widening access and maintaining quality. Taken together, these topics indicate that African higher education systems are still actively constructing and refining their governance frameworks rather than operating within fully institutionalised and stabilised structures.

It is noteworthy that medical education topics each contribute less than two per cent. For this reason, none of them appears in the first-quartile list. However, when combined, they account for 9.40 per cent of African higher education research. This group includes T33 *Nursing & Clinical Education*, T38 *Methods_Experimental*, T45 *Competency-Based Decision-Making*, T46 *Medical & Pharmacy Education*, T2 *Dental Education*, and T36 *Surgical Residency Training*. This strong combined presence reflects Africa's distinctive position within global medical education networks. Research on training health professionals for resource-constrained environments, aligning curricula with local disease burdens such as HIV/AIDS, malaria, tuberculosis, and maternal health, and developing contextually adapted pedagogies has become an area in which African scholarship demonstrates genuine global leadership.

Several topics that are prominent in other regions receive comparatively limited attention in Africa. T15 *Entrepreneurial Education* accounts for only 2.60 per cent, less than half the share observed in Southeast Asia. This may reflect a more cautious reception of entrepreneurship rhetoric. T1 *Historical & Bibliometric Analysis* appears at a very low level, far below the prevalence seen in Latin America, suggesting weaker engagement with reflexive field-mapping or historical analyses of the field. T52 *Engineering Education* and T48 *EFL Education* also remain minimal. The limited presence of T48, in particular, is likely shaped by the linguistic advantage enjoyed by Anglophone African scholars, who face fewer English-language barriers in international publishing than their counterparts in other Global South regions.

E7. COMPARATIVE REGIONAL PATTERNS AND CHARACTERISTICS

This comparative analysis of higher education research in Southeast Asia, Latin America, and Africa shows that the Global South is not a single, uniform periphery. Each region forms its own knowledge space. Each also carries distinct intellectual traditions, strategic priorities, and ways of engaging with global academic systems. All three regions face similar structural challenges. These include limited resources, linguistic barriers, and under-representation in major indexing systems. Yet their responses differ. These differences reflect each region's specific historical experiences, policy settings, and epistemic orientations.

Africa contributes the largest volume of WoS-indexed publications among the three regions. Intra-regional concentration differs sharply. Africa is the most uneven, with South Africa producing the overwhelming majority of the continent's WoS-indexed research. Latin America shows a more moderate pattern, with Brazil as the leading contributor but several other countries making visible contributions. Southeast Asia has the most balanced distribution, with Malaysia, Indonesia, and Singapore each playing significant roles while still sharing space with other national systems.

Southeast Asia shows the most consistent rise, moving from very low publication levels in the early 2000s to a large and steadily expanding output today, supported by strong state investment in research capacity. Latin America's growth within WoS is more modest, but this understates its true productivity because much of its scholarship circulates through regional platforms. Africa has experienced a steep recent surge, driven largely by South Africa's expanding research system.

Southeast Asia has developed the largest critical mass of active scholars, despite its mid-sized author pool, suggesting a stronger degree of field specialisation. Africa also maintains a sizable group of active agents, though most are based in South Africa. Latin America has the smallest WoS-captured critical mass, but this reflects indexing limitations rather than actual capacity.

Africa shows the highest concentration of scholars based in education faculties, indicating the strongest institutionalisation of higher education research. Latin America shows the most interdisciplinary profile, with education playing a comparatively smaller role. Southeast Asia sits between these two positions. Engineering backgrounds are consistently

prominent across all three regions, well above the global average, reflecting shared developmental priorities.

The most striking divergence appears in the representation of scholars from economic and management backgrounds. Southeast Asia has the strongest presence, reflecting its business-oriented and entrepreneurship-focused agendas. Africa occupies a moderate position, while Latin America shows very limited engagement in this area.

The three regions follow distinctly different publication-venue strategies. Latin America has built the strongest regional infrastructure. Several regionally managed and multilingual journals from Brazil, Cuba, and Colombia appear among the top outlets, suggesting a deliberate commitment to publishing in Spanish and Portuguese. Latin American scholars therefore use a dual strategy: they publish locally for regional relevance and selectively target international journals for global visibility.

Southeast Asia shows early signs of developing its own regional platforms, with two journals from Malaysia and Indonesia gaining prominence. Even so, the region's most influential venues remain Northern-managed. This pattern may be attributed to policy incentives that prioritise high-impact international publication and the linguistic diversity that makes region-wide journal development more difficult.

African scholars publish widely in international outlets, yet the continent's own infrastructure is overwhelmingly concentrated in South Africa. Most leading African journals are South African, and journals from West, East, North, and Central Africa are largely absent from major indexes. This concentration sidelines Francophone scholarship and means that "African" publishing infrastructure is, in practice, largely South African.

Southeast Asia follows an applied and developmentalist research agenda. T15 *Entrepreneurial Education* positions universities as engines of economic innovation, while T34 *Quality Assurance* suggests concerns arising from rapid system expansion. The region shows the strongest commitment to quantitative methods, a major focus on digital transformation, and a unique emphasis on T48 *EFL Education*, where English proficiency is treated as strategic human capital.

Latin America pursues a more autonomous and critically reflexive agenda. Strong engagement with T1 *Historical & Bibliometric Analysis* and the distinctive framing of T3 *Student Professional Preparation* manifest the influence of Freirean thought and dependency theory. The region demonstrates confidence in its own theorisation through T51 *Theories & Discourse* and maintains active disciplinary inquiry in areas such as T29 *Tertiary Chemistry Education* and T52 *Engineering Education*. Its methodological pluralism combines quantitative, ethnographic, and participatory approaches.

Africa demonstrates a dual strategy that combines epistemological critique with strategic engagement in areas where it holds clear expertise. T10 *Decolonisation* is central, reflecting a broad project of curricular, institutional, and epistemological transformation. Strong engagement with T51 *Theories & Discourse* and T49 *Bridging Learning, Practice & Research* aligns with efforts to connect universities to societal needs. Medical education topics form another major cluster, where research on training for resource-constrained environments positions African scholars as important contributors to global knowledge. System-building concerns appear in areas such as T34 *Quality Assurance* and T9 *Academic Integrity*.

These agendas represent different strategic responses to global knowledge hierarchies. Southeast Asia strengthens competitive integration by embracing international discourse while maintaining its own developmental priorities. Latin

America asserts epistemic autonomy by building regional alternatives and engaging globally on selective terms. Africa balances transformative critique with strategic participation in fields where it holds comparative advantages. The three regions therefore demonstrate not convergence toward Northern priorities, but the construction of contextually grounded scholarly identities.

This regional analysis shows that the central–peripheral framework identifies important structural inequalities but cannot fully explain the complexity, diversity, and agency within Global South knowledge production. The future does not lie in replacing one hierarchy with another, but in cultivating a *glonacal ecology of knowledge* in which multiple scales, actors, and epistemologies coexist and evolve through sustained engagement rather than assimilation. Such an ecology requires broader forms of recognition that go beyond citation metrics. It also depends on stronger regional publishing infrastructure, more equitable collaboration practices that safeguard Southern epistemic authority, and resistance to linguistic dominance through expanded indexing of non-English scholarship. Above all, it demands valuing epistemic diversity as essential for addressing complex global challenges.

Part

F

National Higher Education Research Spaces: Three Case Studies

F1. WHY A COMPARATIVE APPROACH MATTERS

Comparative and international education has argued that education systems are best understood relationally rather than in isolation to help reveal the ways in which national systems internalise, interpret, or resist forces from the global space (Altbach, 2016; Bray et al., 2014). In this report, the relational stance underpins the methodological approach to analysing the cross-national patterns of how the historical development of higher education system, funding architectures, and regulative policies have shaped the production and dissemination of national higher education research (Torres et al., 2022; Marginson & Xu, 2023). The comparative analysis draws on not only features distinctive to one country but also a broader reflection on the dynamic circulation of ideas, labour force, institutional models, and recognition in the global space (Phillips & Schweisfurth, 2014).

Part F adopts this country-comparative lens to examine higher education research in the United States, the United Kingdom, and Mainland China. The United States exemplifies a large, diversified system in which a stable group of public research universities sustain the world's largest volume of higher education scholarship. While the United Kingdom maintains a comparatively smaller research output and researcher community, it exhibits globally leading influence in knowledge dissemination through its established journal publishing system. The U.K. therefore holds a strategic role as the editorial gatekeeper and manages to shape the discursive conditions of global visibility in the field of higher education. Mainland China represents a rapidly expanding system empowered by its substantial R&D expenditure and supportive policy frameworks. Located at the intersection of global and national research spaces, Mainland China saw both a growing English-language global presence and an enduring Chinese-language national foundation. Mainland Chinese researchers in higher education were found to uphold national pragmatic orientation while integrating international norms in their attempt to navigate both spaces.

Our findings reinforce the argument that knowledge production operates in a multi-scalar spatiality where global and national systems are operated and governed through distinctive languages, epistemologies and objectives (Gao et al., 2025). Comparing the U.S., U.K., and Mainland China therefore allows us to trace how higher education research activities are structured by historical missions and institutional infrastructure at the national level, as well as shifting positions in the production and circulation of knowledge and recognition at the global level. Findings reveal diverse pathways through which countries seek to attract global visibility, establish discourse recognition, and implement scholarly agendas.

F2.
THE UNITED STATES

The United States has been the world's largest producer of higher education research, a position shaped by the scale, diversity, and resources of its higher education and research system. A stable group of large public research universities contribute substantial academic workforce, extensive infrastructures, and rich empirical settings through which higher education can be examined. Co-authorship patterns remain overwhelmingly national in scope, reflecting a strong domestic orientation in knowledge production. Although long influenced by traditions rooted in psychology and large-scale longitudinal research design, the field has undergone a gradual methodological shift, with qualitative, interpretive, and configurative approaches gaining more prominence. It exemplifies a model of global visibility and impact grounded in established scholarly workforce and institutional infrastructures.

The Development of U.S. Higher Education

From the early colonial origins, U.S. higher education institutions have evolved into a remarkably diverse system. The first colleges such as Harvard University (1636) and other colonial institutions were established in the 17th and 18th centuries primarily to train clergy and civic leaders (Thelin, 2019). The 19th century brought major transformations where private liberal-arts colleges and state universities proliferated. In particular, the Morrill Land Grant Act of 1862 and its successor in 1890 were implemented to promote access to higher education, enhance scientific research in agricultural and engineering areas, and provide broader service to the public sector (Geiger, 2017). These land-grant institutions significantly reshaped the higher-education landscape by integrating science, engineering and practical instruction into the mission of public universities (Geiger, 2017).

In the late 19th and early 20th centuries, the American research university began to emerge following in part the German university tradition with a strong emphasis on original research investigation and the granting of doctoral degrees (Veysey, 1981). Concurrently, institutions that would later become community colleges started to emerge in the early 20th century, establishing vocational and technical provisions to further broaden access. The mid-20th century expansion saw the proliferation of specialised institutions such as arts colleges, health-professions schools, as well as tribal colleges that serve indigenous populations (O'Banian, 2019). In particular, the rise of what Clark Kerr (2001) termed as the "multiversity" exemplified a model of large public universities that integrate teaching, research, and various partnerships with the industry and government at scale (Marginson, 2016).

By the post-World War II era, the American system had transitioned from a relatively homogeneous collegiate system to a highly pluralistic ecosystem. It encompasses a spectrum of institutions from research-intensive doctoral universities to small liberal-arts colleges, regional public institutions,

community colleges, and special-focus schools, each responding to different educational needs and societal changes (Thelin, 2019). This diversity is accompanied by a concentration of globally elite institutions. The United States is home to 11 of the top 20 institutions in the Times Higher Education World University Rankings 2026 (Times Higher Education, 2025), demonstrating its academic excellence and research innovation.

Over time the financing of the system evolved into a complex mix of federal and state appropriations, tuition revenue, philanthropic donations, and research grants, with the balance varying widely across institutional types. State funding for higher education began to decline since the 1980s, shifting a greater share of costs to students through rising tuition fees especially at public four-year institutions (Laderman et al., 2023). Federal student-aid programmes such as Pell Grants and federally backed loans were introduced to expand access but has simultaneously increased reliance on debt-financing among students (Laderman et al., 2023). Private institutions depend more heavily on tuition and endowments, reinforcing resource disparities across the sector (Cooley, 2015). While U.S. higher education arguably offers world-leading standards in teaching and research, its funding model has been extensively criticised for exacerbating socioeconomic and institutional stratification (Hamilton et al., 2024; Marginson, 2016).

Regarding the funding architecture for scientific research, about 54 per cent of public R&D funding in the U.S. goes to out-house performers including universities and businesses while 46 per cent is directed to in-house or governmental performers such as the Defense Advanced Research Projects Agency (NSF, 2025). These funding are allocated through major federal funding agencies with diverse distributions of out-house and in-house performers. For instance, the National Science Foundation (NSF) allocates the vast majority of its funding (94%) to universities and businesses, whereas the Department of Energy directs only about 27 per cent to these sectors. NSF supported for roughly a quarter of all federal basic and applied research conducted by U.S. colleges and universities through competitive, peer-reviewed grants (NSF, 2025). These grants aim to build infrastructure, recruit doctoral programmes and sustain high level of scholarly output and international collaboration (James & Singer, 2016). More recently, NSF has formalised "lead-agency" schemes with other national funders such as U.K. Research and Innovation (UKRI) to support opportunities for international collaboration (Owen, 2021).

In summary, U.S. higher education has evolved from a small cluster of colonial colleges into a highly differentiated ecosystem shaped by waves of widening participation, mission diversification, and policy intervention. While the system is internationally recognised for its leading contributions to teaching and research, it is also widely criticised for its steep institutional hierarchies and lack of inclusivity. At the same time, funding agencies such as the NSF have played a crucial role in strengthening research infrastructure, enabling universities and colleges to sustain high levels of scientific output.

Publication Output: Volume, Trends, and Collaboration

Building on extensive research infrastructure and strong funding support, the United States had been the world's largest producer of scientific publications until it was overtaken by China after 2016, largely as a result of China's rapid expansion in STEM fields (NSB, 2024). The United States has nevertheless retained its global leadership in the humanities and social sciences (HSS), accounting for the largest world share (28.3%) and producing more than twice the HSS output of the second-largest contributor, the United Kingdom, in WoS in 2023 (Yang & Li, 2025). Noticeably, recent evidence shows that both the U.S. and U.K. have seen a decline in the volume and global share of HSS publications after 2019 (Yang & Li, 2025). Scholars attribute this trend partly to

declining federal support and research funding in HSS in the United States, compounded by public and institutional perceptions that these fields are becoming less relevant to contemporary careers (Newfield, 2025).

Our data show that the field of higher education research has continued to expand in scale in the United States. The U.S. remains the dominant producer (publishing roughly four times the output of the second-largest contributor) and accounted for nearly two-fifths of global publications between 1991 and 2024, despite a gradual decline in its world share (see Table F1). Annual publication output rose modestly from 87 publications in 1991 to 862 in 2004, before accelerating sharply to reach 6,968 publications in 2024 (see Figure F1).

Regarding the collaboration mode of knowledge production, the United States has seen a high level of collaboration primarily in the form of domestic. The share of co-authored publications experienced an initial drop and then increased steadily after 2005, reaching 86.0 per cent in 2024. Among these co-authored outputs, domestic collaborations remained the majority, although their share fell slightly from 82.8 per cent in 1991 to 69.9 per cent in 2024, as international co-authorship increased over the same period. More specifically, two-country collaborations remained more common than publications involving multiple countries. Nonetheless, both modes have expanded continuously, indicating a trend toward increasingly international and networked teams in higher education research in the United States.

Table F1. U.S. Higher Education Research Publications: Number and World Share by Phase

	Number of publications produced by the US	Number of publications globally	World share
P1 (1991-2004)	7,300	11,927	61.21%
P2 (2005-2014)	25,300	58,030	43.6%
P3 (2015-2024)	49,873	138,674	35.96%
Total	82,473	208,631	39.53%

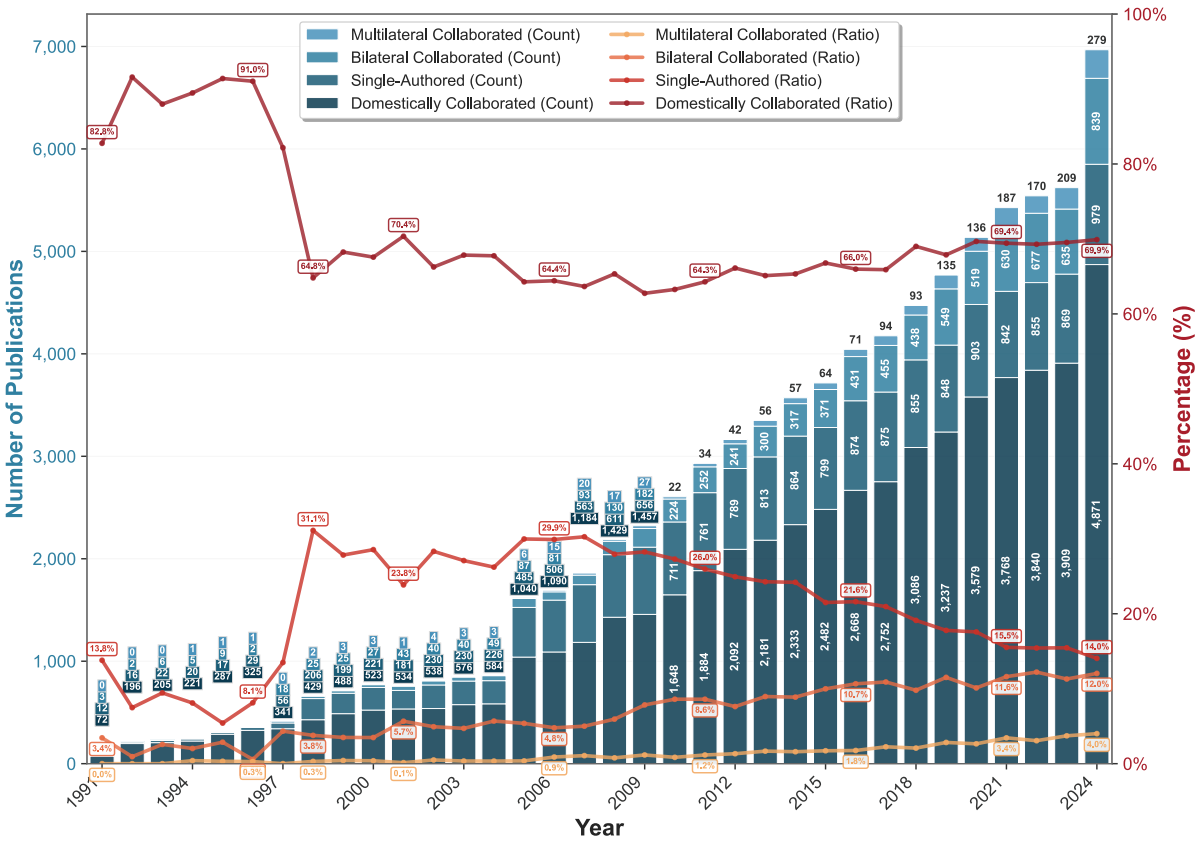

Figure F1. U.S. Higher Education Publication Output and Collaboration Modes (1991-2024)

International research collaboration across the world has become a central driver of national research productivity and impact over the past two decades (Adams & Szomszor, 2024). In 2022, approximately two-fifths of U.S. research publications across all disciplines included at least one international co-author, a proportion higher than China (18.7%) but lower than Germany (55.8%) and the U.K. (66.6%) (NSB, 2024). Noticeably, the proportion of international collaboration in U.S. HSS research appeared to be considerably lower than other leading research nations. Between 2000 and 2023, only 19.4 per cent of U.S. HSS publications were international co-authored, compared to 37.9 per cent in Mainland China, 36.8 per cent in Germany, and 31.9 per cent in the U.K. (Yang & Li, 2025). This indicates that HSS research in the United States remains strongly domestically grounded, a pattern mirrored in the predominance of domestic co-authorship within the field of higher education research.

A closer examination of the United States' international collaboration profile shows that its principal partners include Euro-American countries such as Canada, the United Kingdom, Australia, and Germany, as well as emerging research powers such as Mainland China, South Korea, Turkey and Taiwan , China (see Table F2). Collaborations with the emerging countries and regions have expanded markedly since early 2000s in line with their rising research capacities. Against the backdrop of escalating geopolitical tensions between China and the United States, which have had adverse effects on STEM collaboration since 2018 (Jia et al., 2024), the field of higher education research appears to have been less directly affected regarding the volume of collaborative publication. China remains one of the U.S.' most significant partners in higher education research, with co-authored outputs continuously increasing from 93 publications in 2020 to 178 publications in 2024.

Table F2. Leading Collaborative Countries/Regions of the United States in Higher Education Publications

	Countries / Regions	Number of publications
1	Canada	1696
2	UK	1105
3	Mainland China	1027
4	Australia	821
5	South Korea	576
6	Germany	465
7	Netherlands	348
8	Turkey	340
9	Taiwan, China	314
10	Spain	285

In short, the United States continued to see growth in productivity of higher education publications and remains the largest global contributor in this field, despite a recent decline in its overall HSS output and global share. While domestic co-authorship remains dominant, international collaboration has grown steadily, with rising engagement particularly with Mainland China and other emerging research systems, amid broader geopolitical tensions.

Researcher Profiles and Participation

The number of active researchers in higher education research affiliated with the United States increased substantially from 1991 to 2024, especially during phase II (see Table F3). The number of active researchers globally has seen a similar rising trend, suggesting a simultaneous expansion of the field both in the United States and elsewhere in the world. In particular, the United States' global share of active researchers declined slightly across the three phases, which may be attributed to rising participation from non-U.S. scholars and increasing international openness in the field.

Table F3. Active U.S.-Affiliated Higher Education Researchers: Number and World Share by Phase

	Number of U.S.-affiliated active researchers	Number of active researchers globally	World share
P1 (1991-2004)	83	158	52.53%
P2 (2005-2014)	1,816	4,201	43.23%
P3 (2015-2024)	3,179	7,813	40.68%
Total	3,244	8,025	40.41%

Centres of Knowledge Production

At an institutional level, our data shows that key hubs of knowledge production in higher education in the United States remain highly centred in large public research universities. Referencing the *Carnegie Classification of Institutions of Higher Education*, the leading framework that provides a nuanced understanding of institutional diversity across the U.S. higher education landscape (Shulman, 2001), we classify institutions into Doctoral Universities (further divided into R1: Very High Research Activity, R2: High, and R3: Professional), Master's Colleges and Universities, Baccalaureate Colleges, Associate's Colleges (community colleges), Special Focus Institutions (e.g., arts or health professions schools) (Shulman, 2001).

All of the universities listed as leading knowledge producers in higher education (see Table F4) fall under the category of "Doctoral Universities – Very High Research Activity (R1)" based on the Carnegie Classification. These include institutions such as University of Michigan, Harvard University, University of Wisconsin–Madison, Purdue University, and University of California, Los Angeles, which are nationally recognised for their substantial research capacity, abundancy of research funding, a large body of conferred doctorates and robust institutional infrastructure. Meanwhile, smaller or more specialised institutions classified as R2 (High Research Activity) or "Special Focus" institutions under the Carnegie system are absent from this leading-producer list. The latest criteria for R1 university involves at least USD $50 million per year on R&D and at least 70 research doctorates per year, underscoring the importance of research funding and personnel in sustaining research outputs (NCES, 2025).

Table F4. Leading Universities in the United States in Higher Education Research Publications by Phase

	Producers	Outputs
P1 (1991-2004)	University of Michigan	166
	University of Georgia	135
	Harvard University	134
	University of Maryland College Park	124
	University of Wisconsin Madison	118
	University of California Los Angeles	117
	Michigan State University	114
	University of Minnesota Twin Cities	111
	University of Iowa	109
	Ohio State University	100
P2 (2005-2014)	Purdue University	458
	University of Michigan	436
	University of Minnesota Twin Cities	403
	Michigan State University	395
	University of Wisconsin Madison	382
	University of Georgia	354
	Harvard University	336
	Indiana University Bloomington	331
	University of California Los Angeles	318
	Ohio State University	308
P3 (2015-2024)	University of Michigan	1073
	Harvard University	1026
	Michigan State University	1012
	Purdue University	885
	Ohio State University	843
	University of Wisconsin Madison	803
	University of Minnesota Twin Cities	765
	University of Georgia	762
	University of Texas Austin	721
	Indiana University Bloomington	701

Noticeably, with the exception of Harvard University (non-profit private university), all leading producers of higher education research are large public universities, including land-grant institutions, state flagships, and research-intensive campuses within the University of California system. Their prominence reflects distinct historical missions and structural advantages. Land-grant universities, such as Michigan State University and University of Georgia, were created under the Morrill Acts and explicitly tasked with integrating teaching, research, and public service while expanding access to higher education (Geiger, 2017), thereby creating strong empirical contexts for studying equity, governance, and institutional complexity of higher education. State flagships such as University of Michigan and UC campuses such as University of California, Los Angeles likewise have developed extensive doctoral programs to sustain large research output. In the United States public universities collectively award the majority of doctorates including in education, effectively sustaining the scholarly labour pipeline (NCES, 2025).

By contrast, private universities, particularly for-profit institutions, disproportionately concentrate degree production in high-return fields such as business and devote comparatively fewer resources to schools of education (Lovenheim & Smith, 2023). Harvard is one of only a small number of private universities that maintain a large, comprehensive Graduate School of Education (HGSE), a major research faculty producing substantial scholarship on governance, learning, policy, and institutions. Most highly selective private universities like Yale, Princeton, Dartmouth, Brown either do not have schools of education or maintain education programs that are small, professional, or practice-oriented rather than major research producers (Labaree, 2006). This positions Harvard as structurally distinct within the private sector. These structural driven factors systematically position public universities as the central engines of higher education scholarship in the United States.

In addition, strong continuity is evident among the leading producers across three phases. Institutions such as University of Michigan, Michigan State University, University of Georgia, University of Wisconsin–Madison, University of Minnesota Twin Cities, Harvard University, and Ohio State consistently appear across the three phases. This pattern indicates a stable leading group with deep-seated institutional advantages and sustained research capacity rather than a rotating set of producers driven by intensified competition.

Knowledge Dissemination Venues

Defining "key venues" as journals that published more than 100 articles in any consecutive five-year period, we found that the United States hosted the largest share in Phase I, accounting for more than three-fifths of all key higher education journals. Its share then declined to about one third in the following phases (see Table F5), which positioned the U.S. as the second-largest site of knowledge dissemination.

Table F5. Key Venues in Higher Education Research Hosted by the United States: Number and World Share by Phase

	Number of U.S.-hosted active journals	Number of active journals globally	World share
P1 (1991-2004)	45	74	60.81%
P2 (2005-2014)	77	221	34.84%
P3 (2015-2024)	80	248	32.26%

The geographical shifts shown in Figure F2 reflect broader transformations in the U.S. higher education research and publishing landscape. Historically, the concentration of scholarly journals along the East Coast especially in states like New Jersey, Pennsylvania, and New York aligns with the presence of long-established research universities, major academic presses, and professional associations. The geography of scholarly publishing is closely tied to the historical clustering of research-intensive institutions and legacy publishers, many of which were founded in the north-eastern United States (Larivière et al., 2015).

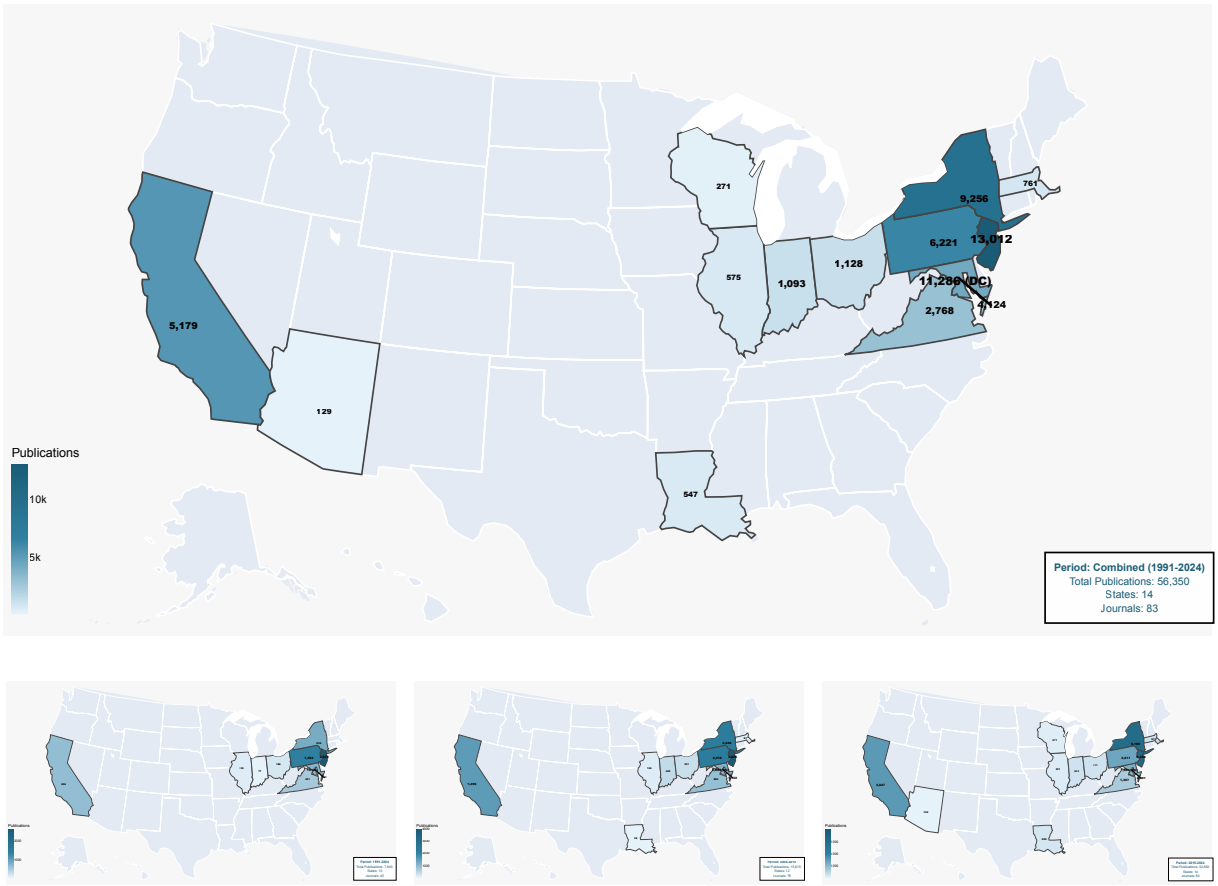

Figure F2. Geographical Heatmap of Key Venues Hosted by Different States in the United States

The growth of Washington, D.C. as a journal hub in phase II and surpassing New Jersey as the leading East Coast node in the next phase reflect the increasing policy orientation of higher education research and the rise of organisations headquartered in the capital. This includes national associations, policy think tanks, and professional societies that either launched journals or acquired editorial control of existing titles (see Slaughter & Rhoades, 2004). The visibility, funding access, and advocacy infrastructure of the D.C. region helped attract editorial offices and new journal ventures, contributing to its rapid expansion. As higher education research expanded in areas such as federal policy analysis, student finance, accountability systems, and equity initiatives (Fyfe et al., 2017), Washington, D.C. became a logical locus for journal establishment and editorial activity.

The emergence of California from 2005 onward similarly corresponds to the growing national and international prominence of West Coast research universities and systems, particularly the University of California which expanded research output and editorial leadership roles. The California higher education ecosystem, with its strong research capacity and diversified institutional missions, increasingly shapes national research agendas (Johnson, 2016), helping explain its rise as a site for new journal activity.

Research Agenda

As discussed at the global level, Topic 49 and 51 captures the core paradigm of the higher education field. T49 *Bridging Learning, Practice & Research* illustrates the central role of higher education scholarship as understanding and facilitating educational practices and policymaking based on rigorous evidence. Specific terms involved in T51 *Theories & Discourses* suggests the theoretical frameworks applied in higher education research,

such as the Foucauldian approach, John Dewey's educational thoughts, and postmodernism approach. A close examination of thematic patterns reveals that U.S. higher education research is anchored in pedagogy and student experience, alongside evolving lines of inquiry in psychology, medicine, and technology shaped by shifting national priorities.

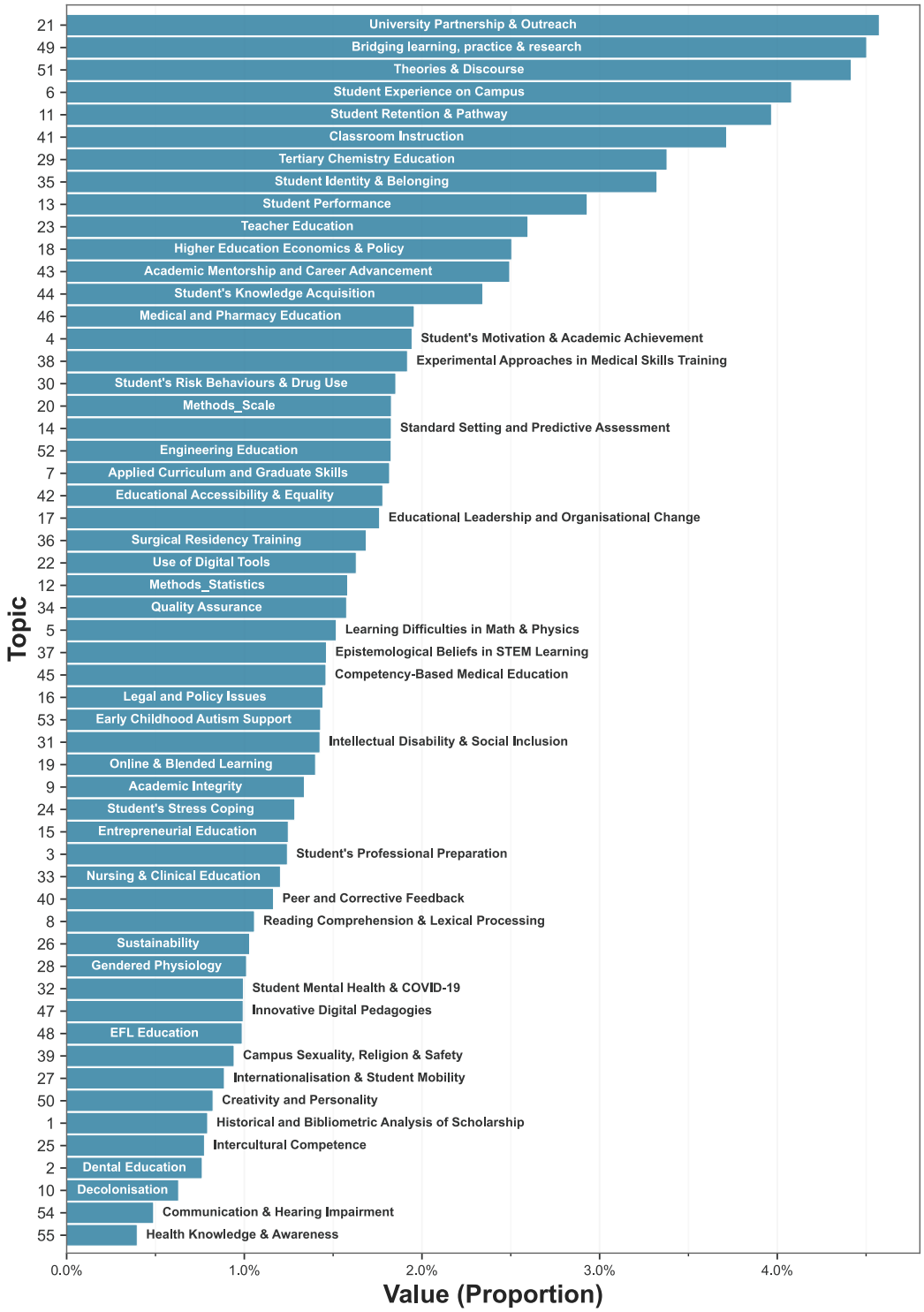

Figure F3. Topic Distribution of Higher Education Publications Produced by the United States

Topics related to pedagogy and student experiences constitute the largest share of U.S. higher education research (see Figure F3), encompassing areas such as *Student Performance* (T13), *Teacher Education* (T23), and *Classroom Instruction* (T41). This emphasis indicates that micro-level perspectives on how students perceive and navigate higher education have long shaped the field (Fuller et al., 2011). Notably, *University Partnership and Outreach* (T21) emerged as a frequently examined theme, reflecting the distinctive U.S. multiversity model characterised by extensive engagement with civil society, industry, and government (Kerr, 2001). Diversity, equity, and inclusion (DEI) also featured prominently, as evidenced by topics such as *Student Identity and Belonging* (T35), underscoring DEI's central role in the historical development of U.S. higher education (Barnett, 2020).

In terms of collaboration patterns and thematic focus, domestically co-authored publications closely mirror the overall topic distribution, indicating a broadly coherent national research agenda. Although international collaborations and single-authored publications exhibited minor variations, both retained a strong emphasis on pedagogy and classroom dynamics. Internationally co-authored work showed a relatively greater focus on *Classroom Instruction* (T41), while single-authored papers placed more emphasis on *Tertiary Chemistry Education* (T29), suggesting that individual researchers may pursue more specialised or discipline-specific lines of inquiry.

Examining the evolution of research topics in the United States from 2005 to 2024 reveals that, although pedagogy and student experiences remain prominent, many related areas experienced either gradual decline or fluctuation over time (see Figure F4). For example, topics such as *Quality Assurance* (T34) and *Engineering Education* (T52) showed a steady decrease in scholarly attention, while *Entrepreneurial Education* (T15) and *Internationalisation and Student Mobility* (T27) displayed more variable patterns. This suggests a shifting thematic landscape in which longstanding areas of focus are increasingly subject to change.

Several noticeable upward trends emerged in research areas related to psychology, technology, and DEI. Most psychological themes such as *Student Motivation and Academic Achievemen*t (T4) and *Students' Stress-Coping* (T24) have attracted growing scholarly attention, while certain aspects such as *Early Childhood Autism Support* (T53) and *Creativity and Personality* (T50) have shown a modest decline. Technology-oriented topics, including *Online and Blended Learning* (T19) and *Innovative Digital Pedagogies* (T47), have expanded steadily, reflecting broader technological advancements during this period. DEI continues to hold a central position in U.S. higher education research, with sustained focus on *Intellectual Disability and Social Inclusion* (T31), *Student Identity and Belonging* (T35), and *Campus Sexuality, Religion, and Safety* (T39), despite a minor decrease in attention to *Decolonisation* (T10) as a more generic topic.

Notably, many medical-related research topics declined in prominence since 2005, with only limited exceptions such as *Experimental Approaches in Medical Skills Training* (T38) and *Competence-Based Medical Education* (T45). Other areas, including *Dental Education* (T2) and *Gendered Physiology* (T28), showed varying degrees of decline. A similar pattern is evident in research on economics and policy, where topics such as *Students' Professional Preparation* (T3) and *Academic Mentorship and Career Advancement* (T43) experienced reduced scholarly attention over time.

National R&D expenditure data indicate that while science and engineering fields grew substantially in 2023 (by 10.7% and 11.5% respectively), the most pronounced proportional increase occurred in non-science and engineering fields, which expanded by 17.8 per cent ($1.0 billion) (NSF, 2024). This category includes much of the work underpinning psychological inquiry, digital learning innovation, and equity-oriented research, aligning with what our findings identifies as growing in prominence. At the same time, sustained growth in life-sciences subfields particularly health sciences and biological

and biomedical sciences, which together accounted for 48 per cent of all university R&D growth helps contextualise the continued scholarly attention to student well-being, stress-coping, and disability inclusion (NSF, 2024). By contrast, the observed decline in medical-education topics may reflect the fact that the surge in life-sciences funding is concentrated in applied biomedical and clinical research rather than in medical pedagogy, thereby shifting institutional priorities away from education-focused inquiry in these fields.

Overall, the rise of psychological, technological, and DEI-related themes alongside the decline of medical, economic, and policy-focused topics signals a reorientation in the intellectual agenda of U.S. higher education scholarship. These shifts echo the broader changes in educational, social, and institutional demands in the United States since 2005.

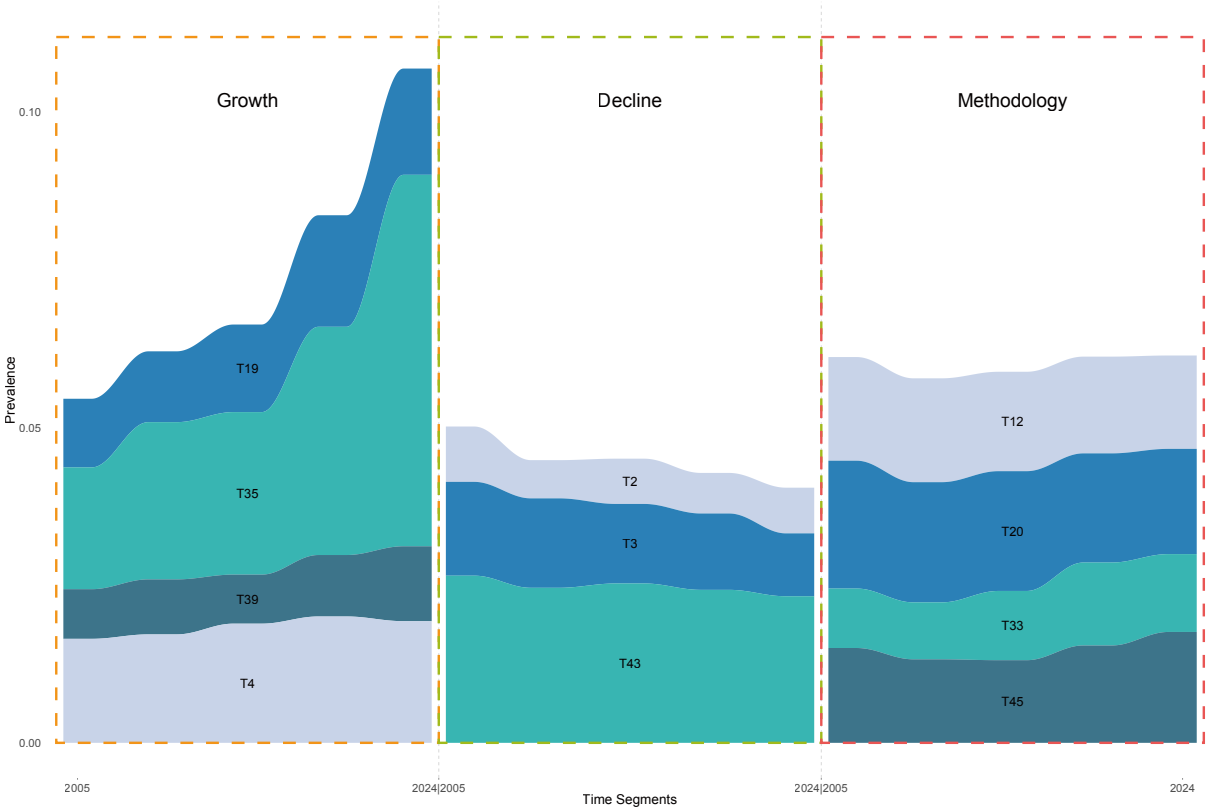

Figure F4. Evolution of the Relative Prevalence of Selected Topics in the United States (2005–2024)

Methodological Orientation of U.S. Higher Education Research

Regarding the methodologies applied in higher education research, the field has historically been shaped by psychology and measurement sciences, with early higher education studies adapting student-attrition models, motivational theories, and experimental logics to examine student experiences (Ethington, 1990; Fuller et al., 2011). This orientation favoured large-scale datasets and longitudinal designs, exemplified by studies such as the National Longitudinal Study of the High School Class of 1972. As higher education system in the United States became more complex and externally engaged, methodological approaches diversified as well to incorporate insights from organisational studies, finance, and policy analysis, drawing on more text-based survey and interview data (Normand, 2020; Volpe et al., 2025). Notably, from the late 1980s to 2010, the field experienced a gradual paradigm shift from causal, measurement-driven inquiry toward more qualitative and interpretive approaches (Muñoz-Najar Gálvez et al., 2020).

Our topic analysis reinforces this methodological shift: qualitative and configurative approaches have become increasingly prominent between 2005 and 2024 (see Figure F4). In particular, *Nursing and Clinical Education* (T33) and *Competence-Based Medical Education* (T45) show growing use of qualitative methods, systematic reviews and Delphi methods. By contrast, quantitatively oriented topics manifested by terms such as inferential statistics (T12 *Methods_Statistics*), and reliability and validity (T20 *Methods_Scale*) have declined over time. This pattern suggests that the earlier turn toward qualitative inquiry in education research (Muñoz-Najar Gálvez et al., 2020) has continued into the higher education domain, further displacing purely quantitative frameworks and diversifying the methodological pool in the post-2005 period.

To summarise, the U.S. higher education system has evolved into a highly diverse ecosystem with a large number of world-leading research-intensive universities. Driven by a growing body of higher education researchers who are highly concentrated in large public research universities, U.S. continues to dominate the production of higher education research globally. Nonetheless, its broader HSS productivity and world share have dropped since 2019 due to funding precarity and political uncertainties. While collaboration remains primarily domestic, international partnerships especially with China and other East Asian systems continue to expand. Regrading topics, research consistently centre on pedagogy and student experience but has increasingly integrated topics in psychology, technology, and DEI. Methodologically, the field is shifting toward more qualitative and interpretive approaches in alignment with the broader paradigmatic change in the education discipline in the United States.

F3.
THE UNITED KINGDOM

The United States and the United Kingdom represent two of the most influential national systems in global higher education research with distinct historical missions, organisational governance, and funding arrangements. The U.K. operated within a comparatively more centralised policy environment, where state-led reforms, selective funding mechanisms, and structured research evaluation frameworks have played a defining role. Despite producing a quarter of U.S. publication volume, the U.K. occupies a unique position as the largest site of knowledge dissemination worldwide, hosting more than 40 per cent of active higher education journals. This has given the U.K. considerable influence over editorial gatekeeping and discourse power in the field (Demeter, 2020). Therefore, the U.K. represents an alternative route to scholarly impact, leveraging journal infrastructure and discursive authority rather than scale alone.

The Development of U.K. Higher Education

The development of higher education in the United Kingdom traces back to medieval foundations. Teaching at University of Oxford is documented from 1096, and the University of Cambridge dates its origin to scholars gathering in 1209 (Scott, 2018). Three Scottish universities, St Andrews, Glasgow and Aberdeen, were later founded in the 15th or 16th centuries (Scott, 2018). In the 19th century, the sector began to expand in response to industrialisation and the demand for science, engineering and civic higher education (Anderson, 2006). Chartered institutions such as University College London and King's College London emerged, and the so-called "Red Brick" universities appeared in major industrial cities such as Birmingham, Manchester, Leeds (Anderson, 2006).

In the following post-war era, a series of policy initiatives set out to expand student number and scientific manpower. A landmark moment came with the Robbins Report (1963) from the Committee on Higher Education which declared that higher education should be available to all who are qualified by ability and attainment, laying a foundation for the expansion and diversification of new institutions (Anderson, 2006). Following Robbins, the 1960s saw the emergence of the so-called "Plate Glass" universities such as Sussex, York, and Lancaster, as well as the formalisation of the binary divide between universities and polytechnics (Graham, 2002). This binary divide was then abolished in 1992 through the Further and Higher Education Act which granted university status to former polytechnics and colleges, thereby creating a more unified sector (Graham, 2002). The later Dearing Report (1997) further articulated a 20-year vision aiming at widening participation, lifelong learning, and institutional diversity, The gross enrolment rate of tertiary education in the U.K. reached to 61 per cent

in 2003 (World Bank, 2025).

Historically, U.K. universities were funded heavily through direct government grants via funding councils for both teaching and research (Marginson, 2018b). However, since mid-2000s, the U.K. shifted more cost onto students through policy such as the Higher Education Act 2004 (Marginson, 2018b). Over time the tuition fee cap was raised to £9,000 in England in 2012, further moving the U.K. system towards a market-oriented, fee-based model (Saunders, 2012). The gross enrolment rate of tertiary education underwent a subsequent decrease from 2003 (61%) to 2015 (56%) (World Bank, 2025). This shift from predominantly public subsidy to a mixed public–private funding model signals the U.K.'s accelerated turn toward a neoliberal framework, in which institutions increasingly operate as competitive service providers and students are positioned as consumers (Marginson & Yang, 2024).

Regarding the funding for research, The U.K. operates a dual-support model combining block grants (Quality-Related funding, QR) to support core research infrastructure with competitive project-based grants awarded by national research councils. QR funding is allocated based on the results of Research Excellence Framework (REF), a national evaluation exercise carried out roughly every 6–7 years that assesses research quality such as publications, impact beyond academia and research environment (UKRI, 2025a). Prior to 2018, national research councils operated independently under the Research Councils UK (RCUK) framework. The Higher Education and Research Act in 2017 unified them into UKRI, which now coordinates funding across seven disciplinary councils, Innovate UK, and Research England (UKRI, 2025b). Through this model, universities are supported both for baseline capacity and for winning external grants.

International engagement is a strategic priority for UKRI. Since its establishment in 2018, it has supported collaboration with over 8,000 organisations across 188 countries, with top partners being the US, Germany, France and Canada (UKRI, 2025c). U.K. is particularly active in international collaboration in social sciences. Economic and Social Research Council (ESRC), which operates under UKRI and supports disciplines such as economics, education, geography, social policy and psychology, reported over half of funded project involving collaborations with international partners (UKRI, 2025c).

In sum, the development of higher education and research in the United Kingdom progressed from its medieval foundations at Oxford and Cambridge to a significantly expanded and diversified sector shaped by industrialisation, post-war policy initiatives, and landmark reports such as Robbins (1963) and Dearing (1997), and Higher Education Act (2004). Over time, the funding model for higher education institutions shifted from predominantly public grants to a mixed public-private framework, with rising tuition fees reflecting a transition toward a more market-oriented higher education system. Funding for research in the United Kingdom gradually shifted toward a more centrally coordinated and internationally oriented structure.

Publication Output: Volume, Trends, and Collaboration

Although the total number of publications in the U.K. (22,336) over the period of 1991-2024 is approximately one-fourth of that produced in the United States (82,473), the U.K. has consistently ranked as the second largest producer globally. In terms of world share, the U.K. accounted for around 10 per cent of all higher education publications (see Table F6). It underscores the U.K.'s sustained and robust capacity for higher education research. More broadly, the United Kingdom also plays a key role in humanities and social sciences research. Its HSS publications accounted for around 14.2 per cent of world output (also as the second largest producer after the United States) in the WoS during 2000–2023 (Yang & Li, 2025).

Table F6. U.K. Higher Education Research Publications: Number and World Share by Phase

	Number of U.K. publications	Number of publications globally	World share
P1 (1991-2004)	1,777	11,927	14.90%
P2 (2005-2014)	7,880	58,030	13.58%
P3 (2015-2024)	12,679	138,674	9.14%
Total	22,336	208,631	10.70%

The evolution of productivity in higher education research in the United Kingdom from 1991 to 2024 reflects similar trend to that observed in the United States. It started with a modest growth during the initial phase and was followed by substantial expansion in the subsequent two decades (see Figure F5).

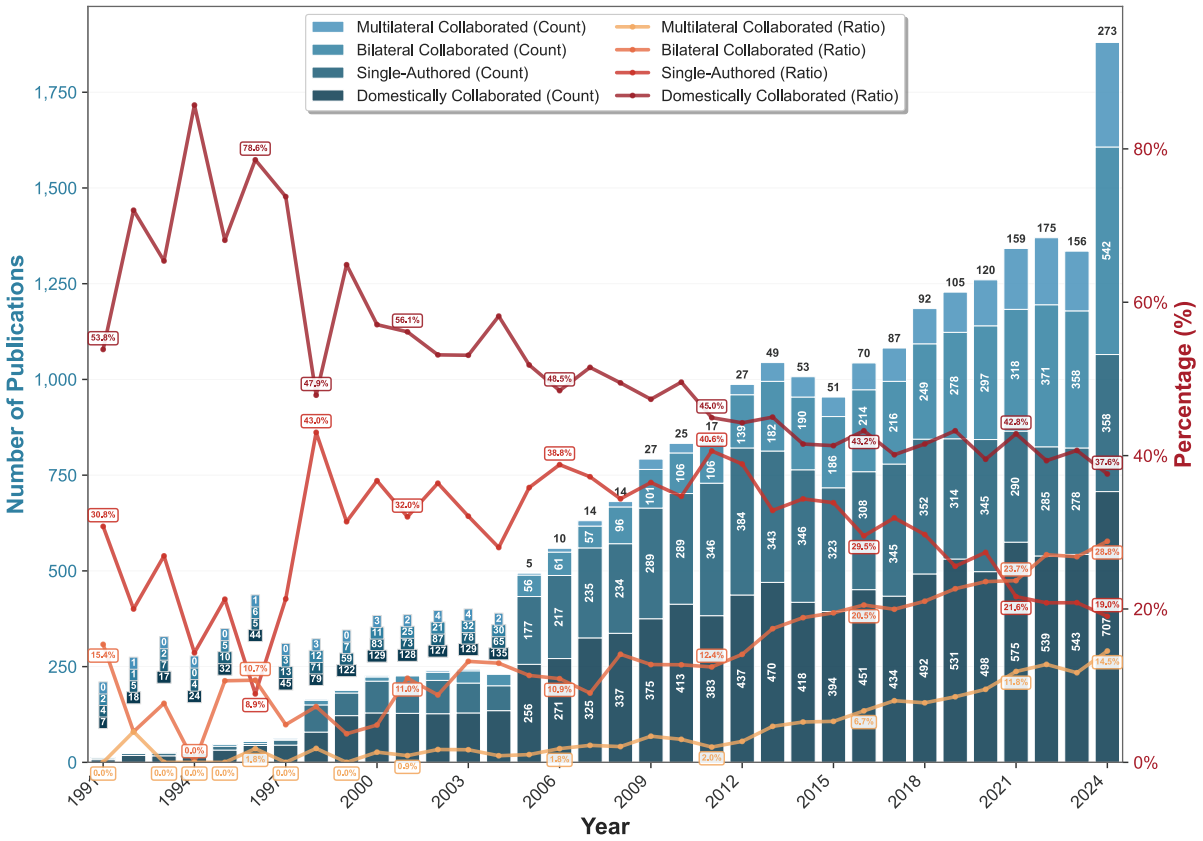

Figure F5. U.K. Higher Education Publication Output and Collaboration Modes (1991-2024)

The division between single and collaborative authorship in the United Kingdom also closely mirrors that observed in the United States. Since 1998, the share of co-authored publications has risen steadily, reaching approximately 81.0 per cent by 2024, while single-authored work has declined (19.0%). However, unlike the consistent dominance of domestic collaboration in the United States (69.9% in 2024), the United Kingdom experienced a marked decline in domestic collaboration from 78.6 per cent in 1996 to 37.6 per cent in 2024. Meanwhile international collaboration grew substantially to 43.4 per cent in 2024. Both bilateral and multilateral international collaborations increased sharply after 2004, reaching approximately 28.8 per cent and 14.5 per cent respectively in 2024 (see Figure F5).

The U.K.'s strong international engagement in higher education research aligns with broader patterns observed across the humanities and social sciences. Between 2000 and 2023, approximately 31.9 per cent of all U.K. HSS publications indexed in the WoS involved at least one international co-author, a proportion much higher than that of the United States (19.4 %) and comparable to Mainland China (37.9 %) and Germany (36.8 %) (Yang & Li, 2025). This shift is potentially driven by the growing international orientation of major funding bodies that increasingly encourage cross-border research collaboration (UKRI, 2025c).

A closer examination of U.K.'s international collaborator profile reveals key partners including the United States, and Commonwealth countries such as Australia, Canada and South Africa. Half of its major collaborators are European countries, including Netherlands, Ireland, Spain, Germany, and Sweden (see Table F7). Compared to the United States, fewer emerging science powers were visible in the list, except for Mainland China. This indicates that longstanding geopolitical relationships and Commonwealth linkages continue to shape U.K.'s international collaboration in higher education research.

Table F7. Leading Collaborative Partners of the United Kingdom in Higher Education Publications

	Countries	Number of publications
1	USA	1105
2	Australia	1067
3	Canada	458
4	Mainland China	400
5	Netherlands	351
6	Ireland	307
7	Spain	301
8	Germany	291
9	South Africa	262
10	Sweden	188

Researcher Profiles and Participation

Similar to the trends observed in the United States, the United Kingdom's world share of active researchers has declined across the three phases, reflecting more inclusive global participation of the field (see Table F8). Notably, the U.K.'s world share of active researchers generally mirrors its world share of publication volume over the three phases, indicating a relatively balanced scale between research labour and output.

Table F8. Active U.K.-Affiliated Higher Education Researchers: Number and World Share by Phase

	Number of U.K.-affiliated active researchers	Number of active researchers globally	World share
P1 (1991-2004)	31	158	19.62%
P2 (2005-2014)	578	4,201	13.75%
P3 (2015-2024)	814	7,813	10.42%
Total	863	8,025	10.75%

Centres of Knowledge Production

The data on the institutional venue of knowledge production reveal that within the U.K. higher education research, universities with established research capacities and reputations appeared as the most robust knowledge production centres, whereas institutions of more recent origin show limited representation.

As shown in Table F9, the federal University of London and University College London dominated the top output list over the phases. Traditionally elite institutions like University of Oxford and University of Cambridge surged in the second and third phases. The "red brick" universities (civic, industrial-city institutions founded in the late 19th/early 20th century) such as University of Manchester, University of Leeds, University of Birmingham are also well-represented in the table and show strong growth. Meanwhile, the "plate glass" universities (founded in the 1960s wave of expansion) such as University of York and University of Sussex are absent among the top producers, so are former polytechnics and recently chartered universities.

Our data suggest that while higher education access may have widened and institutional categories blurred in the U.K., research capacity is still accrued disproportionately to the more established and research-intensive institutions in the U.K.

Table F9. Leading Universities in the United Kingdom in Higher Education Research Publications by Phase

	Producers	Outputs
P1 (1991-2004)	University of London	141
	University College London	100
	King's College London	62
	University of Dundee	62
	University of Sheffield	59
	University of Leeds	55
	University of Birmingham	54
	University of Manchester	52
	Cardiff University	50
	University of Liverpool	49
P2 (2005-2014)	University of London	590
	University College London	420
	University of Oxford	254
	University of Manchester	249
	University of Nottingham	249
	University of Edinburgh	231
	University of Cambridge	214
	University of Birmingham	212
	King's College London	209
	University of Leeds	173
P3 (2015-2024)	University College London	859
	University of London	637
	University of Edinburgh	453
	University of Oxford	449
	University of Cambridge	380
	King's College London	362
	University of Manchester	333
	University of Nottingham	328
	University of Glasgow	310
	University of Bristol	309

Knowledge Dissemination Venues

Although the United Kingdom hosts a smaller research community and produces fewer publications in higher education compared to the United States, it has surpassed the U.S. as the world's leading site of knowledge dissemination since phase II. Across 1991–2024, U.K. consistently hosted for over two-fifths active journals worldwide (see Table F10). This indicates that the U.K. exercises disproportionate influence through its journal infrastructure, positioning itself as a dominant gatekeeper of higher education scholarship.

Table F10. Key Venues in Higher Education Research Hosted by the United Kingdom: Number and World Share by Phase

	Number of U.K.-hosted active journals	Number of active journals globally	World share
P1 (1991-2004)	34	74	45.95%
P2 (2005-2014)	101	221	45.7%
P3 (2015-2024)	100	248	40.32%

U.K.'s dominance in academic publishing is historically rooted in a unique convergence of early commercialisation, English-language advantage, and the embedding of publishing within academic prestige systems. Beginning in the post-war period, British publishers such as Pergamon Press and later Taylor & Francis, Wiley-Blackwell, and Routledge pioneered a commercial model that treated journals not as scholarly artefacts to be subsidised, but as scalable, profit-generating products sold to a growing international university market (Fyfe et al., 2017). Crucially, these firms capitalised on the rise of English as the lingua franca of science and scholarship, enabling U.K.-based publishers to expand globally and set editorial standards (Fyfe et al., 2017). Major commercial publishers have particularly expanded their control over scholarly output with the rise of digital publishing in the mid-1990s; the five largest publishers together accounted for more than half of all journal articles by 2013 (Larivière et al., 2015). This concentration was especially pronounced in the social sciences, where approximately 70 per cent of publications were produced by these firms, whereas the humanities, STEM and medical subjects remained comparatively independent partly due to the continued prominence of scholarly societies (Larivière et al., 2015).

At the same time, the U.K.'s growing reliance on publication-based prestige has further cemented journals as central gatekeepers of academic reputation (Wilsdon et al., 2015). Although the REF does not formally evaluate outputs using journal metrics such as impact factors or rankings, its emphasis on peer-reviewed publications has indirectly incentivised universities to prioritise outputs from highly ranked and internationally visible journals when selecting REF submissions (Wilsdon et al., 2015, pp. 68-69). This amplified the symbolic and evaluative power of some U.K.-based journals (Wilsdon et al., 2015), consolidating the country's influence over scholarly communication in higher education. Therefore, academic publishers have effectively "made themselves indispensable to the academic prestige economy" by tightly coupling publication with career progression, institutional status, and research funding (Fyfe et al., 2017, p. 17). This structural alignment helps explain why the U.K. remains the world's most influential hub for journal dissemination and publishing power despite having a smaller research base than the U.S.

Research Agenda

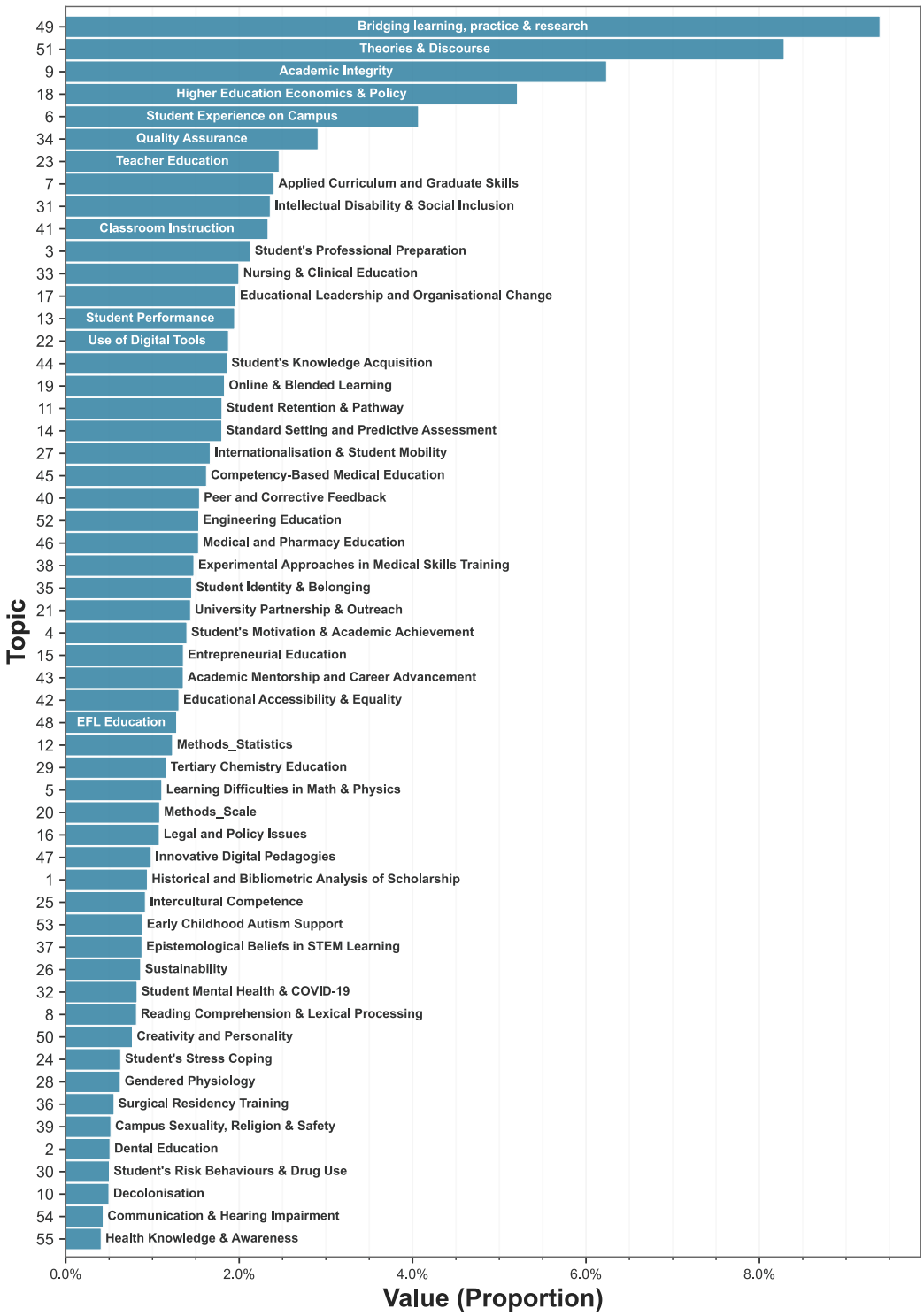

Figure F6. Topic Distribution of Higher Education Publications Produced by by the United Kingdom

The overall topical patterns in U.K. higher education research show both parallels and distinctions with those in the U.S. (see Figure F6). Topics addressing pedagogy and student experience feature prominently in the U.K., including *Student Experience on Campus* (T6), *Quality Assurance* (T34), and *Classroom Instruction* (T41). Yet notable differences emerge: *Academic Integrity* (T9) and *Higher Education Economics & Policy* (T18) appear more frequently in the U.K. than in the U.S., while areas such as *University Partnership & Outreach* (T21) and *Student Retention & Pathway* (T11) are comparatively under-represented. Remarkably, the prevalent topics across international collaborations, domestic collaborations, and solo authored works in the U.K. appear to follow a consistent pattern, indicating the mode of collaboration has only modest influence on topic choice.

Academic integrity features more prominently in U.K. higher education research than in other national systems, a pattern that reflects the U.K.'s distinctive regulatory and philosophical landscape. The U.K. has one of the longest-standing national frameworks for research integrity, including UK Research Integrity Office (UKRIO, founded in 2006), the 2009 Concordat to Support Research Integrity, and UKRI's mandatory governance requirements, which has made integrity a visible and well-institutionalised area of inquiry (UKRI, 2025d). The REF further amplifies this focus by requiring universities to evidence robust integrity processes in their research environment statements, creating strong organisational incentives to study and improve integrity practices (REF, 2025). This intersects with long lasting emphasis on integrity, fairness, and ethical reasoning in educational philosophy and assessment studies (Barrow, 2007; Hirst, 2013), as well as the U.K.'s global leadership in plagiarism detection and contract-cheating regulation (Carroll, 2002), all of which contribute to the high volume of academic integrity research observed in the U.K. topic profile.

A closer examination of topic evolution since 2005 reveals that psychology-related themes particularly student well-being have gained marked prominence in the U.K., mirroring the U.S. (see Figure F7). Topics such as *Student Motivation & Academic Achievement* (T4) and *Student Stress & Coping* (T24) show a clear upward trajectory, whereas other areas including *Student Knowledge Acquisition* (T44) and *Early Childhood Autism Support* (T53) show more modest fluctuations. Meanwhile, increasing attention has been directed toward pedagogy and student experience topics such as *Entrepreneurial Education* (T15) and *Internationalisation & Student Mobility* (T27). In the domain of DEI, some areas like *Student Identity & Belonging* (T35) and *Campus Sexuality, Religion & Safety* (T39) are rising in prominence, while others such as *Educational Accessibility & Equality* (T42) and *Communication & Hearing Impairment* (T54) are gradually declining. Most medically oriented topics have either decreased (e.g., T46 *Medical Pharmacy Education*) or fluctuated (e.g., T33 *Nursing & Clinical Education*), with the exception of *Dental Education* (T2), which continues to show growth. Although topics concerning economics and policy are among the most prominent in U.K. higher education research, nearly all exhibit downward trends (e.g., T16 *Legal & Policy Issues*; T21 *University Partnership & Outreach*), with only *Sustainability* (T26) and *Academic Mentorship & Career* (T43) showing upward trajectories among this group. Most methodological topics did not see much changes in prevalence since 2005.

In short, the U.K. higher education research broadly mirrors the U.S. emphasis on pedagogy and student experience, yet it assigns comparatively greater attention to themes such as academic integrity and higher education policy while devoting less focus to university outreach and student pathways. Since 2005, the U.K. landscape has shown a marked rise in psychology-related topics particularly those concerned with students' mental health, alongside some aspects in DEI. These patterns align closely with ESRC funding distributions. An analysis of 2,059 successful ESRC research grants and fellowships awarded between 2013–14 and 2018–19 shows that the most common primary subject (defined as the discipline that is the most prominent in the research) was psychology, closely followed by sociology,

together accounting for roughly one quarter of all awards (UKRI, 2021). This concentration of funding in the behavioural and social sciences provides a structural explanation for the strong and growing presence of psychological and student-experience themes in U.K. higher education research. Additionally, UKRI's strategic priorities for the 2023–2029 period, particularly "Securing Better Health, Ageing and Wellbeing" and "Creating Opportunities, Improving Outcomes", further reinforce national investment in research areas related to wellbeing, inequality, and social outcomes (UKRI, 2025), helping to shape the thematic contours observed in the U.K. topic pattern.

The United Kingdom represents a highly influential and structurally distinctive higher education research system. Rooted in medieval origins and later reshaped by Robbins, Dearing, and the 2004 Higher Education Act, the U.K. evolved into a mass, market-oriented, and research-evaluated sector guided by a mixed funding model and the REF.

Although it produces one-quarter of U.S. publication volume, it is consistently the second-largest global contributor with a strong international collaboration network, with nearly half of outputs involving cross-border collaborators. Crucially, the U.K. has become the world's leading site of knowledge dissemination, hosting over 40 per cent of active higher education journals based on established commercial publishers, English-language dominance, and prestige-driven evaluation. Research topics centre on pedagogy, academic integrity, with rising emphasis on psychology and wellbeing, aligning with the long-term strategic priorities of UKRI.

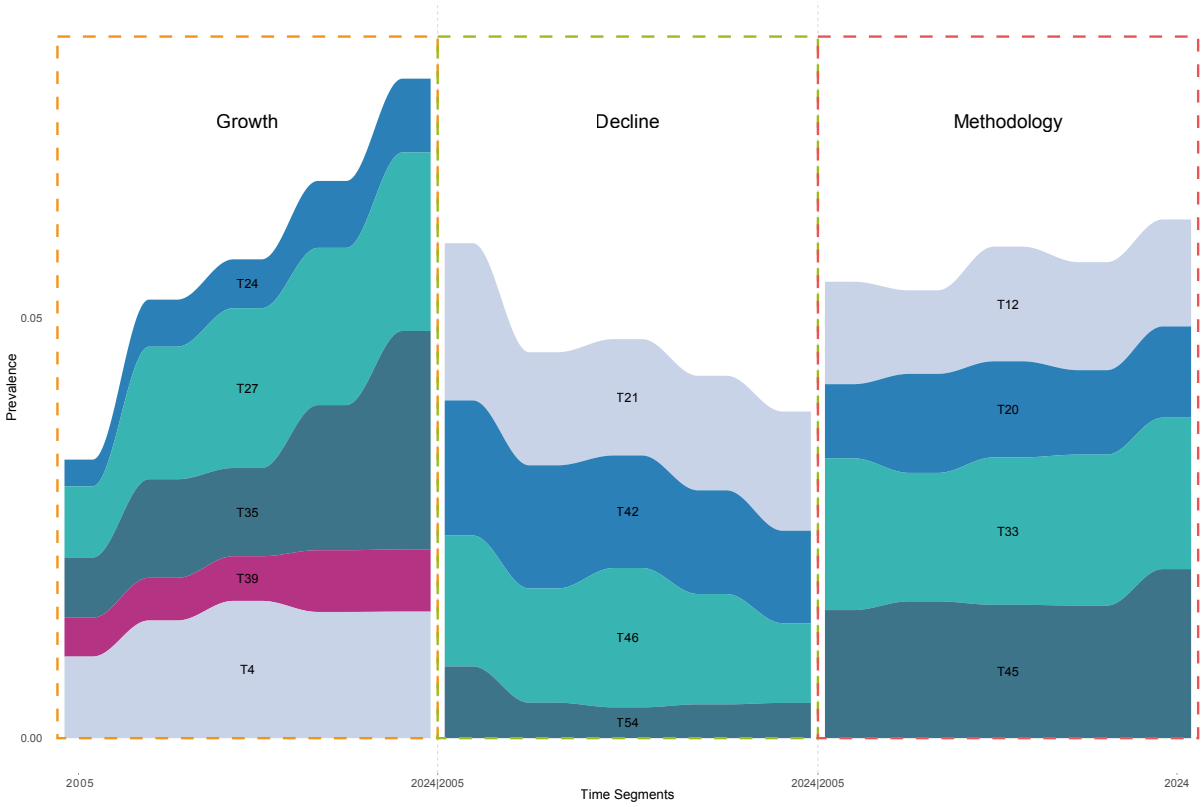

Figure F7. Evolution of the Relative Prevalence of Selected Topics in the United Kingdom (2005–2024)

F4. MAINLAND CHINA

The two cases above illustrate how the United States and the United Kingdom have come to global leadership in higher education research through distinct institutional pathways. Nonetheless, the current analysis is constrained by the salient English-language bias of the WoS database (89% indexed publications in English), systematically excluding large bodies of scholarship published in other languages such as Chinese, Spanish, and French (WoS, 2020). This is particularly consequential for the social sciences, where research is often embedded in local cultural, political, and epistemic traditions that do not readily translate across contexts (Hayhoe, 1993). To develop a more comprehensive understanding of the higher education research landscape in national and global spaces, it is necessary to adopt a multi-scalar lens that integrates and comparatively analyses national and global databases. While U.S. and U.K. have more locally oriented researcher community and academic journals, they join the global common pool of higher education knowledge more easily due to linguistic and institutional advantages.

The third case we selected to complement the global landscape is Mainland China, chosen for its rapid expansion, its growing role in international research collaboration, and the linguistic accessibility it offers for the analysis of Chinese-language scholarship. Mainland China represents one of the fastest-growing systems in higher education research, both in terms of publication volume and the size of its scholarly community. Its global share of publications increased from just 0.31 per cent in 1991–2004 to 4.91 per cent in 2015–2024, placing it fifth worldwide in the most recent phase. It also occupies a key position in global collaboration networks, ranking as the third-largest collaborator with the United States and the fourth with the United Kingdom. In addition, as the authors of this report are fluent in Chinese, examining Chinese-language outputs enables a more accurate and comprehensive analysis of knowledge production within the national research space. The comparative analysis of the U.S., U.K., and Mainland China provides a multi-scalar picture of higher education research. Mainland China has rapidly expanded from a marginal contributor to a significant producer of higher education research, supported by substantial funding support and a large and increasingly collaborative domestic scholarly community. At the same time, its knowledge production remains bifurcated across global and national spaces, with WoS capturing only a selective portion of a much larger Chinese-language ecosystem.

The Development of China's Higher Education in Global and National Spaces

The higher education system in the People's Republic of China (PRC) evolved through a series of distinct phases. Following the foundation of the PRC in 1949, the early period (roughly 1949-1965) was characterised by Soviet-style organisation of higher education with strong state control, modest enrolments and emphasis on ideological as well as technical training (Zheng & Kapoor, 2021). After a severe disruption of The Cultural Revolution (1966-1976), the "reform and opening up" initiative ushered in a period of growth and reform with expanding resource investment and student access (Mok, 2021). From the late 1990s into the 2000s China moved toward the mass-higher-education era, as enrolments grew rapidly and the state introduced major initiatives aimed at building world-class universities (e.g., Project 211 in 1995, Project 985 in 1998 and later the Double First-Class Construction plan in 2015) to elevate leading institutions and disciplines (Zheng & Kapoor, 2021).

Within the higher education system in Mainland China, institutions can be categorised along multiple dimensions. By ownership and governance, there are public/state-run colleges and universities, private institutions, and Sino-foreign cooperative institutions (Mok, 2021). By mission and academic level, the structure encompasses research universities offering Bachelor's, Master's and Doctoral degrees, professional/undergraduate institutions offering mostly Bachelor's degrees, and vocational institutions offering associate diplomas or undergraduate vocational degrees (Shen, 2022). By policy designation, elite-tier groupings such as Project 211, Project 985 and the Double First-Class Initiative identify institutions that receive targeted government support and preferential policy status (Shen, 2022). These classifications reflect a broadly tiered landscape of higher education in Mainland China with a relatively small set of elite research-intensive universities, a broader set of general undergraduate universities, and a large vocational or associate-degree sector (Yang, 2018).

Financing of higher education in China has undergone changes from a predominantly state-funded model to a more diversified funding base, though the state remains central. In the 1980s and early 1990s, government appropriations constituted the overwhelming majority of institutional funding, with public universities fully state-funded and tuition fees nearly non-existent (Han & Xu, 2019). With expansion of the sector and the shift towards a socialist market economy, cost-sharing mechanisms were introduced. Tuition fees were piloted in 1997 and became more broadly implemented by 1999 in public institutions (Mok, 2021). Non-government sources such as donations and income from affiliated enterprise activities began to contribute around the similar period (Mok, 2021). Additionally, funding is differentiated by institutions' administration mode. Universities directly under central ministries receive direct central government funding, while many others are funded via provincial or municipal governments (Shen, 2022). Private higher education institutions rely more heavily on tuition fees (Shen, 2022).

In particular, research funding in Mainland China has been centrally coordinated and expanded rapidly, reflecting the state's ambition to position itself as a global scientific and technological leader. China's total R&D expenditure reached RMB 3,327.8 billion in 2022 (approximately USD $811.9 billion), making it the second largest globally after the United States (USD $923.2 billion) (NSB, 2025). The National Natural Science Foundation of China (NSFC) remains the primary national funder of academic research across disciplines, complemented by large-scale "Major Science & Technology Projects" administered through the Ministry of Science and Technology and related agencies (Cao & Suttmeier, 2017). NSFC funding is distributed through a competitive, project-based system that allocates resources across disciplinary panels, with priority areas increasingly aligned to national strategies such as artificial intelligence,

biomedicine, and advanced manufacturing (Bai et al., 2021).

Since the 2000s, Chinese social science research has expanded its global presence in mainstream databases such as WoS and Scopus, with rising publication outputs, increased co-authorship, and a growing share of first-authored articles by Chinese scholars (Liu et al., 2015). The global and national systems of social science research in Mainland China can be understood as interconnected but qualitatively different in operation languages, epistemological traditions, and policy regulations (Marginson & Xu, 2023). Although Mainland China has gained increasing global visibility, it continues to sustain a robust national knowledge system operating primarily in Chinese language, grounded in local intellectual traditions and oriented towards national priorities (Marginson, 2022b). In this configuration of multi-scalar knowledge production, some Mainland Chinese higher education researchers move across global and national spaces and produce knowledge that vary in objectives, epistemologies, audiences, and forms of legitimacy (Gao et al., 2025). Our data presents more nuances in the dynamics of the two research spaces in Mainland China, where they coexist with heterogeneous governance logics and do not collapse into one another.

Publication Output: Volume, Trends, and Collaboration

Mainland China's WoS-captured productivity in higher education research has grown exponentially from 1991 to 2024, rising from a world share of only 0.31 per cent in Phase I to 4.91 per cent in the most recent phase (see Table F11).

Table F11. Mainland China Higher Education Research Publications in WoS: Number and World Share by Phase

	Number of publications produced by China	Number of publications globally	World share
P1 (1991-2004)	37	11,927	0.31%
P2 (2005-2014)	807	58,030	1.39%
P3 (2015-2024)	6,809	138,674	4.91%
Total	7,653	208,631	3.67%

More detailed data reveals that Mainland China's higher education research output indexed in the WoS did not begin to expand substantially until around 2005 (see Figure F8). Over the decade thereafter, phase III witnessed a marked acceleration, increasing from just 205 publications in 2015 to 1,826 in 2024.

The global position of Mainland China's higher education research is consistent with wider publication trends in HSS. Between 2000 and 2023, Mainland China ranked sixth worldwide in HSS outputs indexed in the WoS (Yang & Li, 2025), and by 2022 it had surpassed the United Kingdom to become the second-largest producer after the United States (Yang & Li, 2025). However, when viewed across all WoS-indexed disciplines, China's social science publications still represent a relatively small proportion of global output (approximately 1.4 per cent), compared with 8.5 per cent for the United States (NSB, 2025). This modest share of social science is shaped in part by structural factors, where global databases systematically privilege English-language scholarship and limit the visibility of research published in Chinese, as discussed earlier.

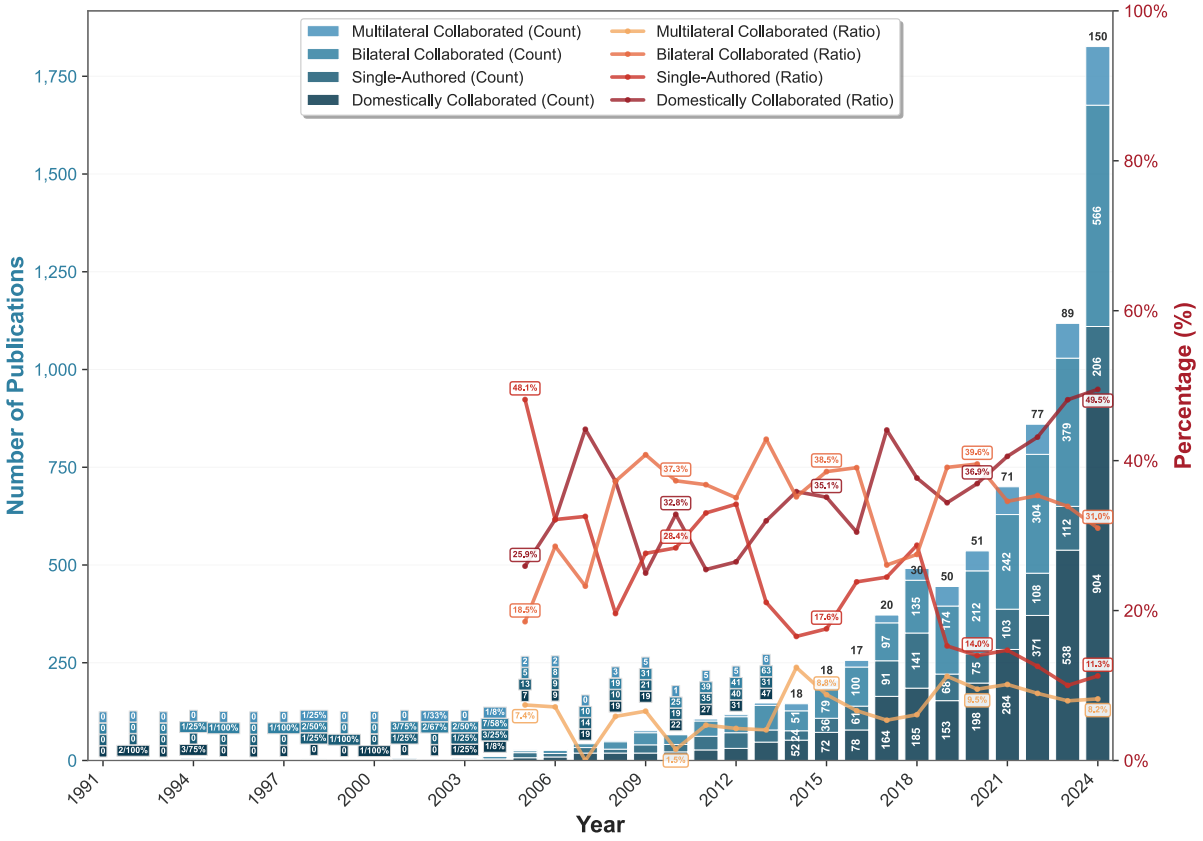

Figure F8. Mainland China Higher Education Publication Output and Collaboration Modes in WoS (1991-2024)

We analysed collaboration modes from 2005 onwards where productivity started to substantially grow (Figure F8). Higher education researchers in Mainland China display a higher collaboration propensity compared with counterparts in the U.S. or the U.K. Approximately 84.0 per cent of publications from Chinese higher education institutions between 1991 and 2024 involved at least one co-author (see Figure D7). Among these co-authored works, domestic and international collaborations were roughly equally split during 2005–2020, although from 2021–2024 a sustained upward trend in domestic co-authorship has emerged (see Figure F8). By 2024, international co-authorship accounted for 39.2 per cent and domestic co-authorship 49.5 per cent. This collaboration landscape mirrors patterns observed in China's broader social science research: among China's social science publications indexed in Scopus between 2010 and 2019, approximately 41.4 per cent were internationally co-authored, 48.8 per cent domestically co-authored, and 9.8 per cent single-authored (Liu et al., 2021).

China's international collaboration patterns in higher education research reflect both engagement with established social science centres and the influences of regional proximity. The United States, the United Kingdom, and Australia as major global producers of higher education research feature prominently among China's leading collaborators. At the same time, geographically and historically connected regions, including Hong Kong SAR, Macau, SAR, and Taiwan, China, constitute a substantial share of co-authored output (Table F12). Malaysia and Singapore also appear in the list, underscoring the strength of China's regional research networks in Southeast Asia.

These patterns largely mirror China's collaboration profile in the broader social sciences. While Japan and South Korea were active in China's wider social science co-authorship networks (Yang & Li, 2025), they do not appear among the top collaborators in

higher education research, suggesting that collaboration choices are shaped not only by geopolitical ties but also by disciplinary orientations.

Table F12. Leading Collaborative Countries / Regions of Mainland China in Higher Education Publications in WoS

	Countries / Regions	Number of publications
1	US	1027
2	Hong Kong SAR	587
3	UK	400
4	Australia	303
5	Taiwan, China	205
6	Canada	161
7	Macau SAR	154
8	Malaysia	136
9	New Zealand	112
10	Singapore	93

education research reflect both engagement with established social science centres and the influences of regional proximity. The United States, the United Kingdom, and Australia as major global producers of higher education research feature prominently among China's leading collaborators. At the same time, geographically and historically connected regions, including Hong Kong SAR, Macau SAR, and Taiwan, China, constitute a substantial share of co-authored output (Table F12). Malaysia and Singapore also appear in the list, underscoring the strength of China's regional research networks in Southeast Asia.

These patterns largely mirror China's collaboration profile in the broader social sciences. While Japan and South Korea were active in China's wider social science co-authorship networks (Yang & Li, 2025), they do not appear among the top collaborators in higher education research, suggesting that collaboration choices are shaped not only by geopolitical ties but also by disciplinary orientations.

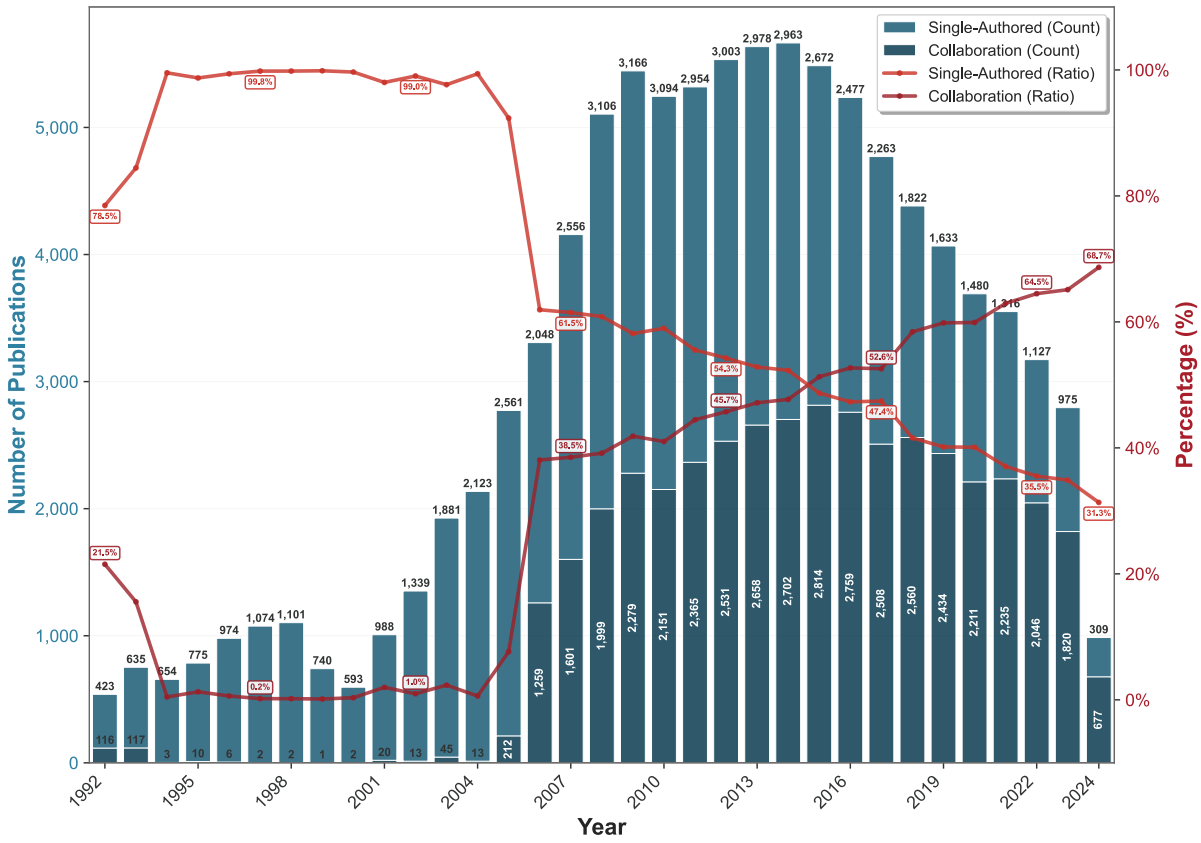

Figure F9. Mainland China Higher Education Publication Output and Collaboration Modes in CNKI (1992-2024)

Overall, Mainland China's growth of productivity in WoS and CNKI reflects both its strengthening domestic research capacity and its deepening integration into international scholarly networks, particularly with major Anglophone producers and regional partners. Meanwhile, the strong presence of domestic collaboration in both spaces reflects the expansion and strengthening of Mainland China's higher education research community.

Researcher Profiles and Participation

Mainland China's active higher education researchers indexed in WoS expanded markedly between 2015 and 2024, rising from virtually zero in 1991–2004 to around 2.77 per cent of the global researcher population in the most recent phase (see Table F13). In contrast, within the national research space, the most rapid expansion occurred earlier, during 2001–2005 and 2006–2010, when the number of active researchers grew by 216.45 per cent and 164.86 per cent respectively (see Table F14, see also Gao et al., 2025). The subsequent contraction of the researcher community in Table F14 mirrors the decline in CNKI-indexed productivity after 2015 discussed earlier. Existing studies also indicate that only a small subset of Mainland Chinese higher education researchers publish in both databases, with limited overlap between national and global systems (Gao et al., 2025). These patterns suggest that both the volume of publications and the size of the researcher community are substantially larger within the national system than in the global arena, highlighting the strength and depth of Mainland China's domestic research base.

Table F13. Active Mainland China-Affiliated Higher Education Researchers in WoS: Number and World Share by Phase

	Number of Mainland China-affiliated active researchers	Number of active researchers globally	World share
P1 (1991-2004)	0	158	0.00%
P2 (2005-2014)	32	4,201	0.76%
P3 (2015-2024)	216	7,813	2.77%
Total	217	8,205	2.64%

Table F14. Number of Active Higher Education Researchers in Mainland China in CNKI by Phase

	Number of active researchers in CNKI	Growth Rate
P1 (1992-1995)	91	/
P2 (1996-2000)	152	67.03%
P3 (2001-2005)	481	216.45%
P4 (2006-2010)	1,274	164.86%
P5 (2011-2015)	1,534	20.44%
P6 (2016-2020)	1,280	- 16.56%

Centres of Knowledge Production

The institutional pattern in Table F15 closely reflects the historical evolution of China's higher education system. In the early phase (1991–2004), the small number of WoS-indexed publications came from a dispersed set of institutions, including Sichuan University, Jiujiang University, and several medical universities. This dispersed pattern is consistent with the institutional structure of the development phase where universities were more specialised and research in the social sciences including higher education remained marginal and fragmented. From phase II onward, Mainland China's leading contributors shifted toward the country's elite comprehensive universities such as Beijing Normal University, Peking University, Tsinghua University, Zhejiang University, East China Normal University (ECNU), and Shanghai Jiao Tong University. These

institutions were among the earliest and most directly supported through Project 211 (1995), Project 985 (1998), and later the Double First-Class Initiative (2015). Such initiatives concentrated funding, doctoral training capacity, and research infrastructure in a small group of elite universities, enabling them to dominate publication output in higher education research.

Beijing Normal University's leadership from phase II manifests its longstanding national role as China's premier teacher-training and education research institution. Likewise, the rise of ECNU and Central China Normal University underscores the historical prominence of normal universities in the development of Chinese education research, dating back to the post-1949 commitment to teacher education and ideological formation (Hayhoe & Li, 2010). The emergence of institutions such as the Guangdong University of Foreign Studies and South China Normal University in the most recent decade reflects broader system expansion, where provincial universities especially in economically dynamic regions benefit from provincial investment, cross-border academic links, and the growing demand for policy-relevant higher education research (Zhang, 2022).

Overall, the institutional distribution seen in Table F15 illustrates how Mainland China's contemporary higher education research capacity has been shaped by hierarchical state funding, policy designations, and disciplinary specialisation. Elite comprehensive and leading normal universities dominate output because they benefit from centrally coordinated research funding (particularly through NSFC and ministerial support) and maintain extensive doctoral training pipelines. Their prominence thus mirrors the broader historical trajectory of Mainland China's higher education system to massified and stratified expansion under state-led excellence initiatives.

Table F15. Leading Universities in Mainland China in Higher Education Research Publications in WoS by Phase

	Producers	Outputs
P1 (1991-2004)	Sichuan University	5
	East China Normal University	2
	Fudan University	2
	Huazhong University of Science & Technology	2
	Jiujiang University	2
	South China Normal University	2
	Beijing Normal University	1
	China Medical University	1
	China Pharmaceutical University	1
	Guangxi University	1
P2 (2005-2014)	Beijing Normal University	53
	Peking University	44
	Tsinghua University	33
	East China Normal University	26
	Shanghai Jiao Tong University	26
	Zhejiang University	25
	Xiamen University	19
	Renmin University of China	15
	Huazhong University of Science & Technology	14
	Nanjing University	14
P3 (2015-2024)	Beijing Normal University	447
	Zhejiang University	257
	East China Normal University	252
	Central China Normal University	248
	Peking University	186
	Tsinghua University	180
	Shanghai Jiao Tong University	133
	South China Normal University	120
	Guangdong University of Foreign Studies	107
	Wuhan University	98

Knowledge Dissemination Venues

In terms of knowledge dissemination, data shows that only one Mainland Chinese journal, *ECNU Review of Education*, is indexed in SSCI, WoS, showing limited impact in global knowledge dissemination and editorial gatekeeping. We also analysed the leading higher education journals in CNKI to portray the national landscape of knowledge dissemination. The leading CNKI journals listed in Table F16 reflect the institutional design, policy priorities, and historical development of China's higher education system. Their prominence is closely tied to the role of provincial education authorities, the legacy of normal universities as hubs of education research, and the use of journals as policy communication and professionalisation channels in Mainland China.

Journals such as *Heilongjiang Researches on Higher Education* and Jiangsu Higher Education illustrate the central role of provincial education commissions and provincial normal universities in shaping the national knowledge system. Since the 1980s and 1990s, provinces have held significant responsibility for higher education administration and reform implementation (Liu & Dunne, 2009). This governance model has produced a dense provincial publishing ecosystem, in which journals are used to circulate local policy interpretations, showcase institutional practices, and support professional development within each region (Xie, 2011). Additionally, Journals like *China Higher Education* and *China Higher Education Research* are backed by national-level organisations such as the Ministry of Education. These journals function not only as academic platforms but also as policy conduits, translating national reforms (e.g., Project 211, Project 985, Double First Class) into scholarly discourse (Liu & Dunne, 2009).

Leading normal universities like ECNU establish journals such as the Journal of Higher Education and Higher Education Exploration, underscoring the legacy of teacher-training institutions as foundational

centres of education research. Since the 1950s, normal universities have been responsible for pedagogy, educational theory, and institutional research, producing a strong disciplinary tradition that persists in the journal landscape (Hayhoe & Li, 2010). Applied and professional journals such as Education and Vocation, China Adult Education, and Research in Higher Education of Engineering signal the state's emphasis on workforce development and applied degrees. These journals' strong outputs reflect priority areas in Mainland China's post-1999 massification era, during which vocational education, adult education, and engineering training became central to national strategies for economic upgrading (Wu & Ye, 2018). Their ranking in the top ten indicates the broad professional remit of Mainland China's higher education system, which integrates academic, vocational, and continuing education under its policy frameworks.

All top journals publish almost exclusively in Chinese, operate within national policy regimes, and target audiences of administrators, researchers, and practitioners within Mainland China. This indicates that Mainland China sustains a robust national knowledge system with its own publication circuit, editorial norms, and criteria of scholarly legitimacy, functioning alongside but not subsumed by the global WoS-indexed system.

Table F16. Leading CNKI Journals in Publishing Higher Education Research

	Journals	Paper Count
	Heilongjiang Researches on Higher Education	5594
2	China Higher Education	5229
3	Academic Degrees & Graduate Education	4400
4	Jiangsu Higher Education	4383
5	China Higher Education Research	4192
6	Education and Vocation	4048
7	Journal of Higher Education	3537
8	China Adult Education	3300
9	Higher Education Exploration	2829
10	Research in Higher Education of Engineering	2324

These patterns reveal higher education research in Mainland China characterised by rapid expansion, strong domestic collaboration propensity, and selective global engagement, with elite universities and normal institutions driving much of the growth. Despite limited global dissemination through WoS-indexed outlets, Mainland China sustains a dense and influential national publishing ecosystem, underscoring the coexistence of parallel global and national knowledge spaces featured different audiences, agendas, and evaluative criteria.

Research Agenda

Mainland China's engagement in the global higher education research space reveals a pattern that is both convergent with and distinct from the dominant Anglophone centres. While Mainland Chinese scholars participate in global thematic trends anchored in pedagogy and student experiences, their topic profile reflects a uniquely practice-oriented and internationally attuned research agenda shaped by national priorities.

The Global Space

Similar to the prevalent topic patterns identified in the U.S. and U.K., pedagogy and student experience related themes also occupy a central position in Mainland China's higher education research, though with distinct emphases (see Figure F10). *Classroom Instruction* (T41) and *Entrepreneurial Education* (T15) rank among the top five topics in Mainland China's WoS-indexed scholarship, which are less prominent in the U.S. or U.K. Other distinguishing themes include *Students' Professional Preparation* (T3), *EFL Education* (T48), and *Internationalisation & Student Mobility* (T27), reflecting both a strong practice- and application-oriented approach to knowledge production and a pronounced outward-looking orientation shaped by the country's internationalisation agenda and emphasis on English-language competencies (Demeter et al., 2025).

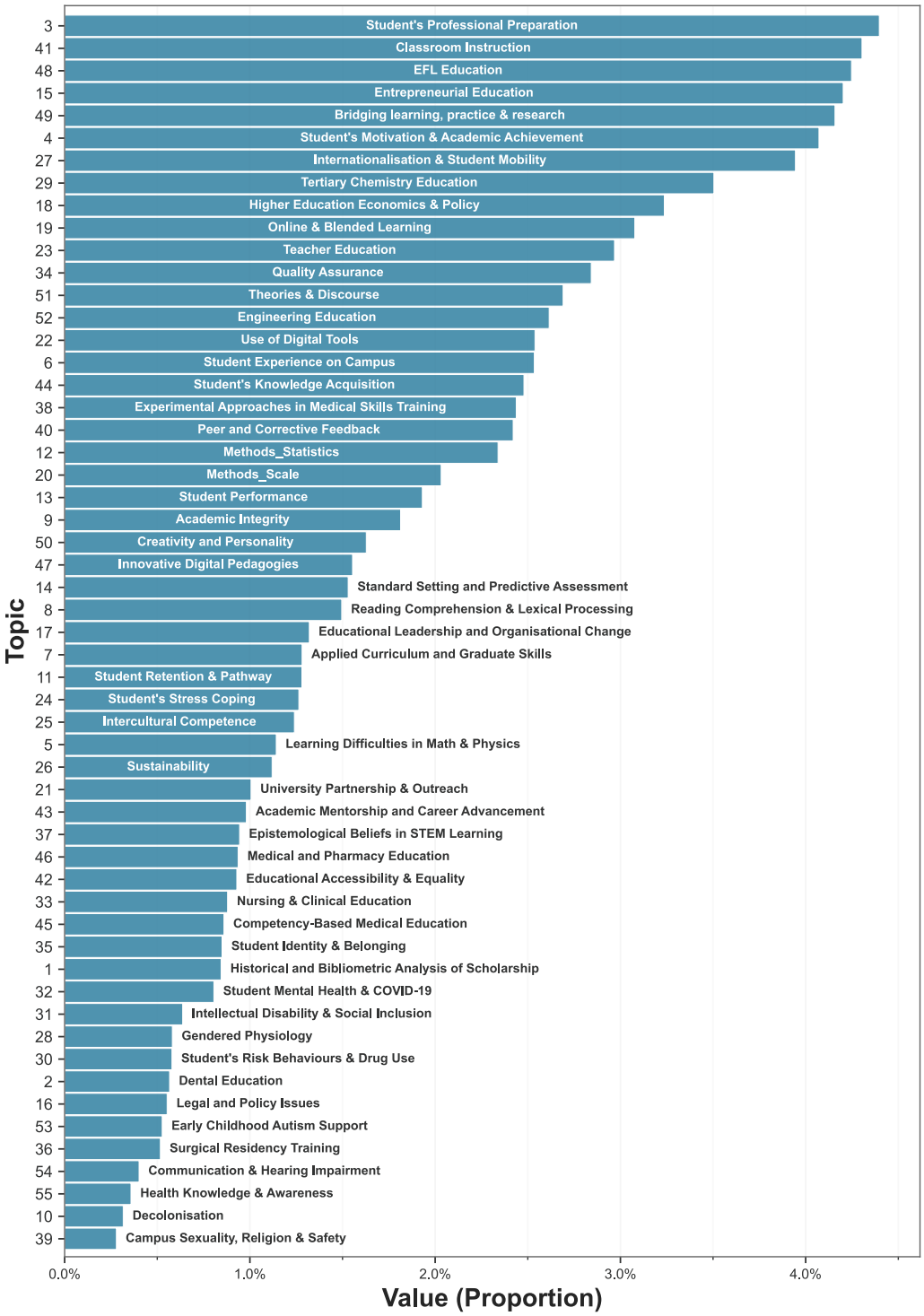

Figure F10. Topic Distribution of Higher Education Publications Produced by by Mainland China in WoS (1991-2024)

Meanwhile, the topic *Theories and Discourse* (T51) displays a comparatively low presence (falling outside the top ten topics), which suggests that analytical frameworks and theoretical lenses receive proportionally less attention among Mainland Chinese higher education researchers than is observed in the U.S. or U.K., thereby reinforcing the argument of Mainland China's strongly practical orientation. Largely similar topic patterns were found in domestic collaboration, international

collaboration, and solo work, with minor differences. For instance, the topic *Tertiary Chemistry Education* (T29) stands out more in domestic collaboration, potentially reflecting Mainland China's emerging global leadership in chemistry research (Wu et al., 2024). In international collaboration, topics such as *Internationalisation & Student Mobility* (T27) and *EFL Education* (T48) rank higher potentially because Mainland China-based researchers engaged in cross-border partnerships have greater access to international contexts and networks (Liu et al., 2015).

Regarding the evolution of topic popularity, Mainland China's higher education research exhibits a pronounced rise in all technology-related themes, including *Online and Blended Learning* (T19), *Use of Digital Tools* (T22), and *Innovative Digital Pedagogies* (T47), in contrast to the more fluctuating patterns of these topics observed in the U.S. and U.K. (see Figure F11). Their rise reflects Mainland China's technological ambition, aligning with recent national science and technology policies that emphasise 'coordinating education, science and technology, and talent development' as a strategic priority in the forthcoming 14th Five-Year Plan (2026–2030) (State Council of China, 2025). Meanwhile, *Sustainability* (T26) continued to gain traction since 2005, adding empirical weight to the wider scholarly discussion that Mainland China is seeking to reposition itself in the global economic, geopolitical, and ideological competition through innovation in sustainability and technologies (Moore, 2022).

As have been observed in the U.S. and U.K., psychological topics related to mental health (e.g., T24 *Student Stress Coping*; T32 *Student Mental Health & COVID-19*) have also gained prominence in Mainland China's higher education research while more classical cognition-oriented topics (e.g., T44 *Student Knowledge Acquisition*; T50 *Creativity and Personality*) have shown either fluctuation or decline. Concurrently, *Student Identity & Belonging* (T35) demonstrates a discernible upward trend with other DEI-related themes such as *Decolonisation* (T10) and *Intellectual Disability and Social Inclusion* (T31) appear to be waning in focus within China's higher education research landscape.

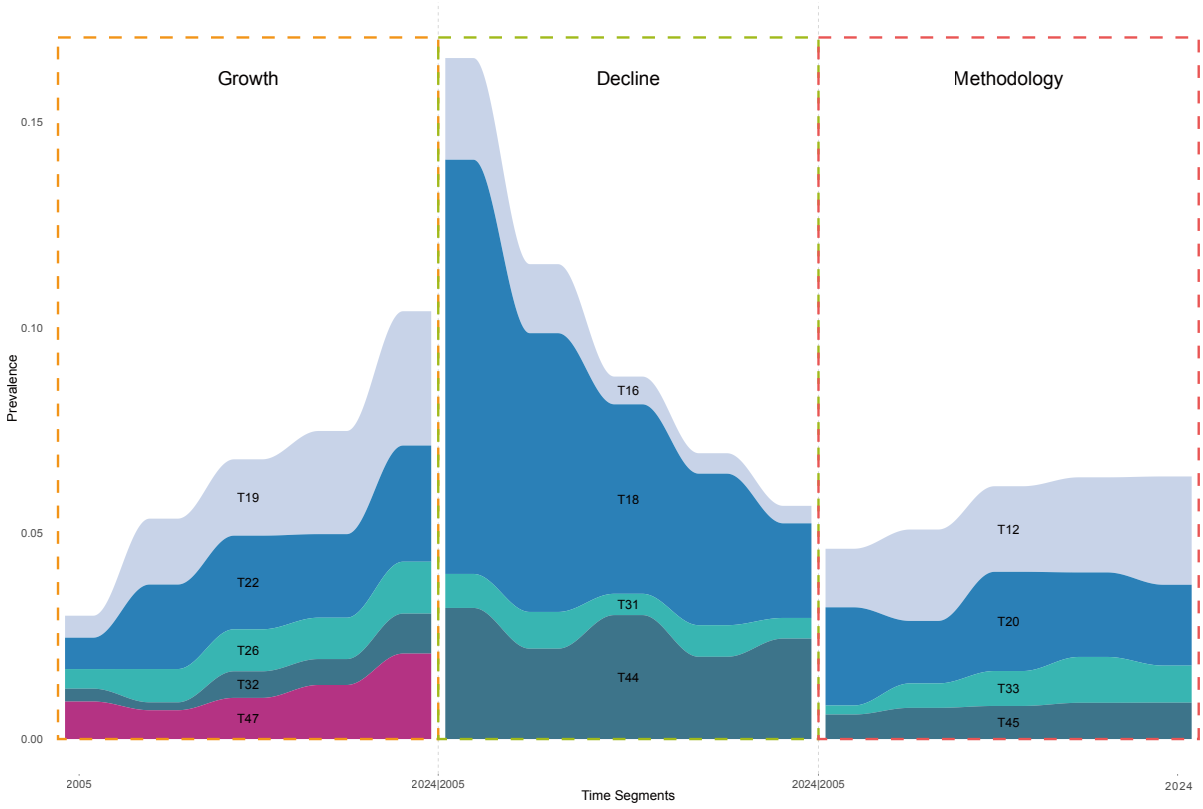

Figure F11. Evolution of the Relative Prevalence of Selected Topics in the Mainland China in WoS (2005–2024)

The National Space

Building on the STM analysis of CNKI publication data, our comparative examination shows that Mainland Chinese higher education researchers adopt markedly different emphases and approaches when working in global and national spaces. This finding aligns with Gao et al. (2025), who identified systematic heterogeneity between Mainland China's national research space and the global higher education research landscape.

Table F17. Research Topics Identified in CNKI Dataset (Ranked by Topic Size, Descending Order)

Topic Number	Label	Top 5 Highest Prob Terms	Average Proportion
T-C 25	National Building	China, society, construction, realisation, modernisation	5.18%
T-C 4	Problem-Solving Approach	Issue/problem, method, theory, discuss, propose	4.79%
T-C 11	History and Ideas of Universities	University, China, U.S. history, modern	4.42%
T-C 8	Talent Cultivation	Cultivate, talent, mode, application, aim	3.6%
T-C 37	Ideological Education	Political thought, politics education, ideology, ideological and political work, moral education	3.44%
T-C 7	Campus Culture	Culture, university, spirit, campus, value	3.42%
T-C 9	Conference Report	President, professor, national, conference, convene	3.34%
T-C 30	HE Reforms	Reform, HEI, system, national, deepen	3.26%
T-C 18	Postgraduate Education	Postgraduates, education, problem, supervisor, suggestion	3.2%
T-C 39	Knowledge Production	Knowledge, value, logic, system, produce	3.12%
T-C 20	Liberal Arts Education	Education, quality, liberal arts, idea, practice	2.97%
T-C 12	Teaching Evaluation	Teaching, evaluation, quality, promote, teacher	2.95%
T-C 6	Regional Development	Economy, development, structure, scale, region	2.75%
T-C 27	Students' Risky Behaviour	Influence, students, factors, variations, behaviour	2.68%
T-C 26	Career Development	Faculty, team, career, development, youth_faculty	2.66%
T-C 13	Community Service	Serve, cooperation, local, HEIs, development	2.61%
T-C 32	Quality Assurance	Quality, evaluation, guarantee, system, standards	2.58%
T-C 3	Laboratory Management	Management, laboratory, construction, security, mode	2.57%
T-C 19	Industry–University–Research Cooperation	Innovation, science & technology, coordinated, mechanism, transfer	2.56%
T-C 24	World-Class University	World, first-class, internationalisation, strategy, construction	2.55%
T-C 17	Power Relation	Organisation, power, relation, administration, academic	2.54%
T-C 21	Graduate Employment & Labor Market	Employment, graduates, problem, society, market	2.48%
T-C 40	University Governance	Governance, university, institution, interest, internal	2.22%
T-C 34	Students' Capability	Capability, research, innovation, practice, cultivate	2.13%
T-C 29	Curriculum Construction	Curriculum, discipline, design, system, construct	2.11%

Topic Number	Label	Top 5 Highest Prob Terms	Average Proportion
T-C 28	Technology Transfer	Research, indicator, input, effectiveness, funding	2.08%
T-C 22	Private HE	Private, law, risk, finance, independent college	2.0%
T-C 23	Discipline Construction	Discipline, construct, first-class, characteristics, interdisciplinary	1.86%
T-C 36	Classroom Instruction	Learning, teacher-student, classroom, interaction, teaching	1.85%
T-C 15	Experiment Teaching	Experiment, teaching, design, student, technology	1.71%
T-C 31	HE Policy	Policy, institution, transition, doctoral students, venue	1.65%
T-C 2	Academic Integrity	Academic, virtue, freedom, ethics, norms	1.61%
T-C 5	Teacher Education	Teacher, training, Normal University, internship, professionalisation	1.57%
T-C 35	Financial Aid	Student, aid, U.S. government, financial	1.55%
T-C 33	Resource Allocation	Resource, performance, allocation, sharing, assess	1.48%
T-C 38	University Enrolment	Admission, equity, examination, opportunity, enrolment	1.36%
T-C 10	Degree Awarding	Degree, discipline, Doctoral students, Postgraduates, thesis	1.33%
T-C 14	Human Capital	Capital, society, competition, market, mobility	1.19%
T-C 1	Entrepreneurial Education	Entrepreneurship, innovation, ecology, practice, student	1.11%
T-C 16	Engineering Education	Engineer, excellence, program, discipline, cultivate	1.07%
T-C 41	Regional Collaboration	Collaboration, ASEAN, promote, link, free trade	0.47%

Our data shows that Mainland Chinese researchers seem to emphasise micro-level topics (individual learning and experiences) in global space and prefer macro-level topics (legal, economic, and policy issues) in the national space. For instance, in WoS, micro-level themes such as *Classroom Instruction* (T41; T-C 36) rank as the second-largest topic, yet it occupied a comparatively minor position in CNKI. *Entrepreneurial Education* (T15; T-C 1) ranks fifth in WoS but falls among the least three represented topics in CNKI (see Table F17). Micro-focused topics like *Student Professional Preparation* (T3) and *Student Motivation & Academic Achievement* (T4) are notably prominent in WoS, whereas comparatively more macro-oriented themes in WoS such as *Legal and Policy Issues* (T16) and *Decolonisation* (T10) tend to appear in the less prevalent half in the list. While *Higher Education Economics & Policy* (T18) with a macro focus has larger presence in WoS, it saw a major decline of prevalence after 2005 (see Figure F11). This contrasts with CNKI patterns, where researchers devote significantly more attention to broader topics such as *National Building* (T-C 25) and *History and Ideas of University* (T-C 11), while more narrowly focused areas like *Experiment Teaching* (T-C 15) and *Engineering Education* (T-C 16) had less presence. CNKI topics also display a distinct regional focus through topics such as *Regional Development* (T-C 6) and *Regional Collaboration* (T-C 41), which are largely absent in WoS.

Earlier analysis suggests a strong practical orientation in Mainland China's WoS-indexed higher education research, reflected in its limited dependence on theory-driven approaches. This problem-solving ethos is even more pronounced in CNKI. Apart from *Human Capital* (T-C 14) and *Power Relation* (T-C 17), both of which have applied economic or governance dimensions, few topics engage explicitly with theoretical frameworks. Instead, the largest CNKI topics, *National Building* (T-C 25) and *Problem-Solving Approach* (T-C 4), underscore a research culture oriented toward serving national development goals and addressing practical institutional challenges rather than pursuing theory-led or curiosity-driven inquiry (Feng, 2010). This shared orientation across WoS and CNKI suggests a consistent ideological foundation underpinning Mainland Chinese higher education research, irrespective of whether the

thematic focus is micro or macro. It also resonates with long-standing speculative and dialectical traditions within Chinese humanities and social sciences, where the practical utility of research in addressing real-world problems is prioritised as a core epistemic value (Yu, 2018).

From a temporal perspective, macro-level topics relating to policy, economics, and ideological narratives (e.g., T-C 25, T-C 11, T-C 9, T-C 30) show decreasing prevalence over time (see Figure F12). Meanwhile, topics such as *Knowledge Production* (T-C 39) and *Academic Integrity* (T-C 2) exhibit rising attention. Additional upward-trending topics including *Industry-University-Research Cooperation* (T-C 19) and *Community Service* (T-C 13) highlight the growing emphasis on ecosystem partnerships between higher education and broader society. Similarly, the increasing prominence of *Talent Cultivation* (T-C 8) and *Technology Transfer* (T-C 28) reflects Mainland China's ambition to leverage technological innovation for educational and workforce development, mirroring trends observed in WoS. Collectively, these shifts illustrate evolving research priorities within Mainland Chinese higher education research and suggest potential global influences as China becomes more embedded in international scholarly networks (Zhao et al., 2025).

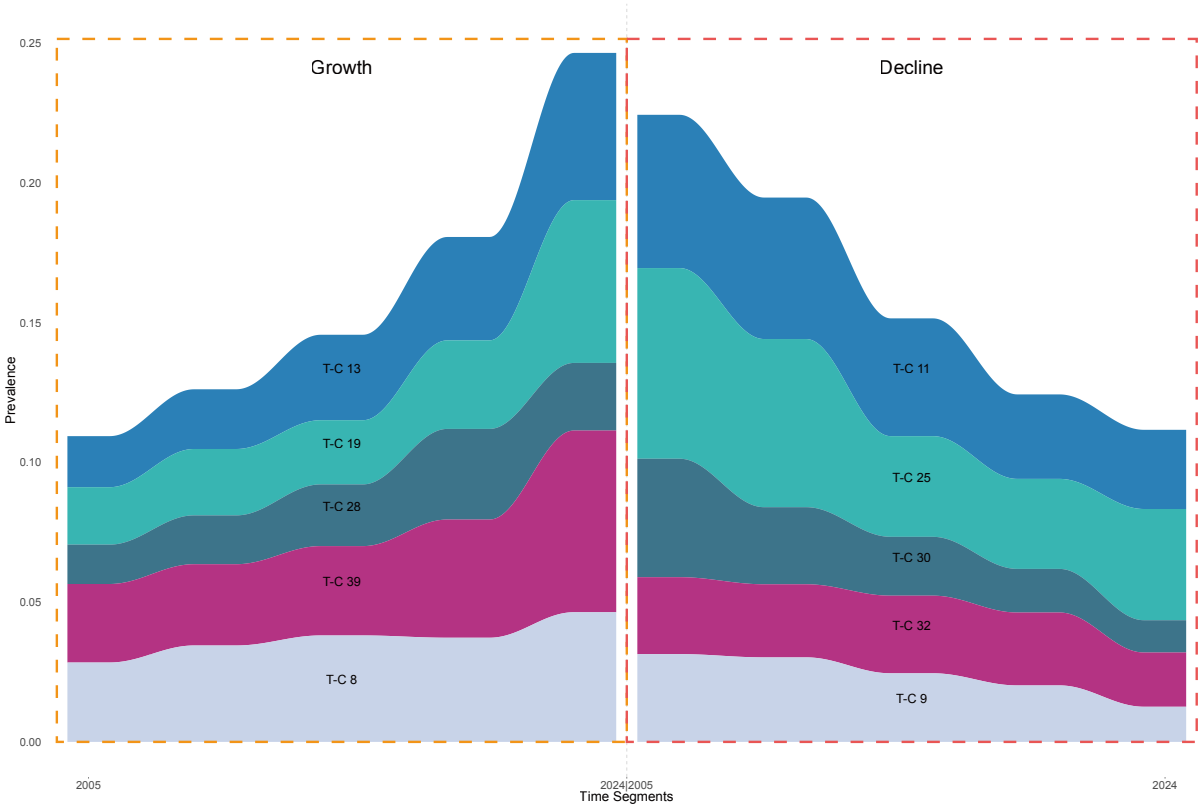

Figure F12. Evolution of the Relative Prevalence of Selected Topics in the Mainland China in CNKI (2005–2024)

Mainland China's higher education research displays a distinctive dual orientation across global (WoS) and national (CNKI) spaces. In WoS, scholars emphasise micro-level and practice-oriented topics such as classroom instruction, student preparation, and digital learning, reflecting a strong applied focus and alignment with national technology and talent-development priorities. In CNKI, however, research centres more heavily on macro-level, policy- and governance-oriented themes such as national development, university history, regional collaboration, and problem-solving approaches, underscoring the field's role in serving state agendas and institutional reform. Across both spaces, theoretical work remains comparatively limited, while practical relevance and developmental utility consistently shape the trajectory of Mainland Chinese higher education research.

While Mainland Chinese higher education researchers may adapt or recalibrate theoretical frameworks and methodological approaches to align with the norms of international journals (Marginson & Xu, 2023), our data suggests that they simultaneously cultivate research orientations that draw on their own intellectual traditions and strategic national priorities. These orientations differ from those prominent in the U.S. and U.K. and diverge subtly from the dominant themes observed in China's national research space, revealing a hybrid mode of engagement in which scholars negotiate between global norms and domestic agendas. In doing so, they navigate a unique pathway to global visibility that remain anchored in the national imperatives of capacity building and problem-solving, illustrating the multi-scalar balancing that characterises Mainland China's global knowledge production (Gao et al., 2025).

Overall, the Mainland China case reveals a higher education research system characterised by rapid growth, dense domestic collaboration, and leading institutional producers concentrated in elite comprehensive universities and normal universities. Knowledge production is organised through parallel global and national circuits: WoS-indexed work foregrounds micro-level, practice-oriented and technologically aligned topics, while CNKI-indexed scholarship prioritises macro-level, policy and nation-building agendas, all underpinned by a shared commitment to practical problem-solving and state-led development and less on theory-driven inquiry.

F5. COMPARATIVE ANALYSIS ACROSS THE THREE COUNTRIES

A cross-national reading of the United States, the United Kingdom, and Mainland China reveals that higher education research is neither a uniform global enterprise nor a loose aggregation of national traditions, but a multi-scalar field shaped through the continual negotiation between global pressures and locally embedded institutional, cultural, and epistemic forces. While all three systems participate in a shared global conversation particularly around pedagogy, student experience, and the rising prominence of wellbeing and technology, their engagements with the global field are patterned by historically sedimented missions, funding regimes, and ideological orientations that produce distinct trajectories of knowledge production and circulation.

The United States exemplifies an influential higher education research system where national practices and values largely reflect and embody global scientific norms. The scale and diversity of its research universities provide extensive empirical settings and methodological infrastructures that align with international standards for rigorous, evidence-based scholarship, despite being primarily inward looking based on substantial domestic collaboration networks. Higher education researchers in United States draw on a long-standing psychological and measurement tradition, while it has increasingly seen methodological diversification and an interpretivism orientation. This blend of internal diversity and global prestige reinforces a mode of engagement where global influence is exercised through the cumulative authority of its scholarly labour force and infrastructural depth, rather than through intentional strategic positioning.

The United Kingdom interacts with the global field through a different mechanism: rather than leading through scale, it exercises influence through discursive gatekeeping and the institutionalised authority of its publishing ecosystem. The REF and dual-support funding architecture encourage researchers to align closely with global journal conventions. This alignment works as a national strategy that leverages the U.K.'s structural advantage as the primary host of English-language higher education journals. U.K. nurtures a domestic academic culture that emphasises methodological rigor, policy relevance, and academic integrity. Meanwhile, it remains deeply connected to the global research enterprise through its dense international collaboration networks, featured with an orientation toward Commonwealth, European, and Anglophone scholarly communities. These

patterns show how the U.K. has turned editorial power and international networks into a form of national leverage and exercise scholarly influence through structural gatekeeping.

Mainland China, in contrast, embodies a system in which national forces both accommodate and resist global norms, producing a dual space model of knowledge production that is structurally different from the U.S. and U.K. While its WoS-indexed outputs increasingly reflect global norms linguistically and thematically, these outputs represent only one layer of a much larger research ecosystem. The CNKI space, grounded in Chinese-language scholarship and state-influenced research priorities, demonstrates how national epistemic traditions and policy logics continue to anchor knowledge production despite growing global visibility. Macro-level concerns such as national development, institutional governance, and regional coordination remain central, reflecting a model in which higher education research is closely linked to national policy needs. At the same time, globally active Mainland Chinese higher education scholars adopt hybrid strategies, modifying epistemic routes and emphasising applied micro-level topics to gain international recognition while still working within the state's wider vision for technology and talent development.

While all three systems devote considerable attention to pedagogy and student experience as the core issue in the field of higher education, their broader thematic orientations diverge in ways that reveal underlying funding structures, governance regimes, and epistemic traditions. The U.S. research landscape shows strong psychological, technological, and DEI-driven growth, shaped by diversified funding streams and a competitive research environment that rewards innovation and student-centred outcomes. In the U.K., topic patterns are influenced by the REF and ESRC's social-science remit, producing sustained attention to student experience, academic integrity, and policy-related research within a metrics-sensitive system. By contrast, Mainland China combines a practice-oriented, developmental logic in global publications with a macro-policy and nation-building agenda in national outputs, which may be attributed to the state-led nature of research funding, institutional hierarchy, and the practical epistemologies of Mainland Chinese social science. These patterns highlight how national research ecosystems produce distinctive thematic profiles, even as they converge around core concerns such as learning, wellbeing, and digital transformation.

These three cases reveal how national higher education systems internalise, rework, or resist global scientific norms in different ways. The U.S. largely shapes the global field by virtue of scale and institutional infrastructure. The U.K. structures it through editorial power, prestige logics, and international connectivity. Mainland China increasingly participates in global space but sustains a separate national knowledge order that reflects state-led steering and long-standing epistemic traditions. Their relationships to the global space are therefore not convergent but strategically differentiated. Across all three systems, interaction with the global space does not erase national particularities. Global norms and national systems interact with each other through institutional channels such as funding arrangements, evaluation mechanisms, linguistic structures, and epistemic cultures, and are reinterpreted in ways that reinforce or recalibrate those structures. The result is a higher education research field that is globally interconnected yet persistently uneven, where national histories and policy architectures continue to shape the meanings, methods, and trajectories of scholarly inquiry.

Part

G

Conclusion

This report set out to map, analyse, and interpret the global landscape of knowledge production in higher education research over a 34-year period from 1991 to 2024. Its ambition has been both empirical and conceptual: to generate a comprehensive, multi-scalar evidence base while also advancing a deeper understanding of how higher education research develops, diffuses, and shapes our collective imagination of higher education systems.

The scale and scope of evidence assembled for this report are unprecedented in the field. Drawing on more than 200,000 WoS-indexed articles, nearly 100,000 CNKI publications, and extensive metadata from journals, authors, institutions, and collaboration networks, the report integrates multiple methodological approaches, including bibliometrics, STM, and comparative case analysis to construct a layered and longitudinal picture of global knowledge production. By positioning English-language and Chinese-language corpora side by side, and analysing global, regional, and national dynamics, this report provides an empirical foundation unmatched by previous attempts to study higher education research at scale.

The report should be understood not merely as a descriptive compendium of outputs, but as a baseline infrastructure for future global studies of higher education research. It functions as a diagnostic tool, enabling researchers and policymakers to trace trajectories, identify structural imbalances, and assess capacity developments across regions. It also stands as a future-oriented interpretive framework, offering concepts, metrics, and comparative insights that can guide long-term monitoring of the field as higher education systems evolve under conditions of globalisation, digital transformation, demographic change, and shifting geopolitical orders.

Over the last three decades, higher education has emerged as one of the most influential institutions shaping human development and social organisation. At its core, higher education cultivates individuals, expands intellectual and moral capacities, and contributes to the formation of stable, adaptive, and equitable social orders. The knowledge produced about higher education therefore has profound consequences: it informs governance, shapes public debate, and influences how societies imagine the mission and value of universities.

Our analyses show that higher education research has transitioned from a relatively marginal academic domain into a globally recognised, institutionalised, and rapidly expanding field. The exponential rise in publications, proliferation of journals, strengthening of research communities, and diversification of methodologies all point to a maturing scientific field with increasing policy relevance and public visibility.

At the global level, we observe the consolidation of a field that is increasingly interdisciplinary, internationally networked, and methodologically pluralistic. Topic modelling reveals long-term shifts, including the rise of students' experience, identity and belong, internationalisation, digital transformation, and learning innovation. These developments reflect wider transformations in higher education systems under massification, marketisation, and global competition.

The report demonstrates that Global South regions contribute distinct agendas shaped by developmental priorities, linguistic and epistemic histories, and policy trajectories. Southeast Asia foregrounds innovation, competitiveness, and system development; Latin America centres inclusion and social justice; and African systems prioritise governance strengthening and expansion. These regional pathways show that knowledge production is embedded in contextual pressures and

institutional realities, contributing to a multi-polar global knowledge ecology.

Comparative analysis of the U.S., U.K., and Mainland China reveals three distinctive but interconnected systems of knowledge production. The U.S. operates a large, decentralised research ecosystem in which public research universities anchor high productivity, domestic collaboration predominates, and topics increasingly reflect psychological, technological, and DEI-oriented priorities. The U.K. embodies a centrally regulated and strongly internationalised system, where REF-driven incentives, dual-support funding, and a powerful publishing industry underpin its disproportionately significant role as the global hub of editorial gatekeeper. Mainland China presents a rapidly expanding, dual-circuit system, combining explosive growth in WoS-indexed outputs with an even larger and more policy-oriented national knowledge space; its researchers navigate between global norms and domestic agendas, producing micro-level, practice-oriented topics in WoS while retaining macro-level, developmental emphases in CNKI.

While the centre–periphery model continues to highlight structural imbalances in global science, our findings show that global higher education knowledge production is now better characterised as a glonacal ecology: a dense, interdependent system where global, national, and local dynamics interact continuously. Emerging regions are gaining influence, yet structural inequities persist; diversification has not replaced hierarchy but has rendered it more complex.

Crucially, knowledge about higher education helps shape the field itself. It frames how universities understand their missions, how policymakers design reforms, and how societies value higher education as both a public and private good. The field not only describes social order but actively participates in its formation.

Underlying the empirical evidence is a conceptual insight: higher education plays a foundational role in cultivating individuals and sustaining social order. Across traditions—from Confucian cultivation of *junzi*, to Humboldtian ideals of intellectual autonomy, to Deweyan visions of democratic learning—universities are viewed as institutions that shape reasoning, ethics, and civic responsibility.

As mass participation has expanded to include hundreds of millions of students globally, the developmental and societal roles of higher education have intensified. Knowledge about higher education shapes how societies imagine the role of universities and the kinds of individuals they aim to nurture. It influences whether higher education systems promote social mobility or reproduce inequalities; whether they advance democratic capacities or succumb to technocratic managerialism; and whether universities act as custodians of public goods or engines of market competition. In this sense, higher education research contributes directly to the formation of social order—not by prescribing behaviour, but by shaping the interpretive frameworks through which institutions and policymakers understand their choices.

For researchers, the findings of this report call for integrative, comparative, and longitudinal research designs, methodological pluralism, and deeper engagement with under-studied regions and non-English-language scholarship. For policymakers, the results underscore the need for stable funding, investment in local journals and multilingual platforms, support for research training, and recognition of higher education research as part of national knowledge infrastructure. For practitioners, the growing knowledge base offers practical insights into governance innovation, digital learning, quality enhancement, student support, and institutional resilience during rapid transformation.

Despite the breadth and depth of evidence assembled in this report, several important limitations must be acknowledged. First, research articles represent only a fraction of the knowledge produced within the higher education research community. The genre of the academic article is itself uneven: some publications introduce genuinely new concepts, data, or interpretations, while many others primarily reiterate existing arguments or offer

descriptive accounts without advancing the field conceptually or empirically. The exclusive focus on articles therefore provides only a partial view of the knowledge ecosystem, omitting working papers, policy briefs, institutional reports, scholarly books, and practice-oriented outputs that often have substantial influence on policy or institutional practice.

A second limitation arises from the fact that the primary empirical foundation of this study is drawn from the WoS, a database that is both Western-dominated and overwhelmingly English-language in orientation. Although this platform enables systematic and comparable global analysis, its coverage inevitably excludes substantial bodies of scholarship produced in national languages and circulated through local journals, institutional repositories, and country-specific education research platforms. Our use of CNKI as a complementary dataset illustrates how vibrant, extensive, and conceptually rich national knowledge spaces often remain unrecognised within global indexing systems. The Chinese case demonstrates the analytical value of examining national-language corpora, and highlights how much of the world's higher education research—from Germany, France, Japan, and many other countries—remains largely invisible in global databases.

Recognising these limitations is essential for interpreting the findings of the report. Future research will need to move beyond the narrow focus on journal articles and incorporate multiple forms of knowledge production, while also widening the geographical and linguistic coverage of datasets. Such efforts will contribute to a more complete and contextually grounded global understanding of higher education research.

Looking ahead, the field of higher education research stands at a moment of significant transformation, shaped by profound technological, social, political, and environmental change. The findings of this report underscore the need to build a global knowledge commons that is more inclusive, more interconnected, and better equipped to address the complexity of contemporary higher education systems. Strengthening this commons will require sustained commitment to open science practices, multilingual dissemination, and mechanisms that ensure fair and reciprocal collaboration across regions with differing levels of resources and research capacity. By reducing barriers to participation and enhancing the accessibility of research outputs, the field can foster a more equitable and dialogic global research environment.

Another pressing priority concerns the expansion of data infrastructures to support more nuanced and comprehensive analyses. Existing databases provide only partial visibility into the full landscape of scholarly activity, and future work would benefit from integrating multiple data sources, including international indexing services, national bibliographic platforms, funding databases, institutional repositories, and administrative records. More fine-grained metadata on authors, affiliations, funding flows, collaborations, and institutional characteristics would enable deeper insights into mobility patterns, research capacity building, and structural inequalities in global knowledge production. Building robust, interoperable data infrastructures will be essential for longitudinal monitoring and comparative analysis.

The future of the field will also be shaped by emerging research frontiers that are already beginning to transform higher education systems worldwide. Artificial intelligence and digitally mediated learning environments are reshaping pedagogical practice and institutional governance. Geopolitical tensions and shifting global alignments are influencing research collaboration, student mobility, and the flow of scientific talent. Demographic change is altering enrolment patterns, labour markets, and institutional sustainability. At the same time, the rise of micro-credentials, digital credential ecosystems, and alternative education providers is challenging traditional assumptions about the boundaries of higher education. These developments demand new conceptual frameworks, new methodological tools, and new forms of

interdisciplinary collaboration.

These opportunities point toward a field that is expanding, diversifying, and becoming ever more central to understanding how societies cultivate individuals and sustain social order. Higher education research occupies a unique position at the intersection of education, science policy, economics, and social transformation. As such, it is well positioned to illuminate the choices facing governments and institutions and to support the development of more resilient, inclusive, and forward-looking higher education systems. The next phase of work will require researchers, policymakers, and practitioners to collaborate in building a richer, more globally interconnected knowledge ecology—one capable of guiding higher education through the challenges and possibilities of the decades ahead.

This report marks the beginning of a longer-term effort to systematically document and interpret global developments in higher education research. We plan to produce a major five-yearly global report that will update the key indicators, revisit the multi-scalar landscape of knowledge production, and track emerging trends as the field continues to evolve. In the years between these major editions, we intend to publish special thematic reports focusing on specific aspects of the field. Together, the five-yearly global reports and the thematic special issues will form a sustained, cumulative knowledge infrastructure that strengthens collective understanding of the higher education research field worldwide.

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