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OUTLOOK

Mind the minds

China's education strategy and its implications for NATO

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> **"Learning without thought is useless. Thought without learning is dangerous."**
>
> (Confucius, Analects 2.15)

Long regarded as the 'world's factory,' China is now striving to position itself as the world's thinker and a leading innovator. Under President Xi Jinping's leadership, "moving faster to build a high-quality education system" has been given top priority in order to strengthen the country's innovation ecosystem.[1] Today, the People's Republic of China (PRC) has the largest

Summary

Education lies at the heart of China's grand strategy as it advances its global ambitions and reshapes strategic competition in non-traditional security terms, compelling NATO to rethink the 'China challenge' beyond the military domain.

China is racing at unprecedented speed to become a global education superpower, fuelling its scientific and technological dominance. Yet deep-seated structural weaknesses within its socio-educational system, together with mounting international mistrust, risk slowing its ascent.

NATO in its education and training institutions would be well placed to cultivate the critical thinking necessary for securing the intellectual edge.

1 "2025 Goals, Tasks Set in Government Work Report," The State Council of the PRC, accessed 31 October 2025, https://english.www.gov.cn/policies/featured/202503/07/content_WS67cb05cbc6d0868f4e8f093d.html.

system of higher education in the world,[2] with a gross enrolment rate of 60.80% in 2024 and over 48.46 million students enrolled across 3,119 higher education institutions nationwide.[3] It has also advanced through the Global Innovation Index more rapidly than any other country, ranking tenth among the 139 economies featured in 2025.[4]

What does China's knowledge-driven rise mean for NATO? How might China's growing role as an education powerhouse reshape the international security environment? And what lessons should NATO draw for its own agenda to maintain resilience and secure a strategic edge in future warfare? The answers to those questions depend primarily on NATO's evolving conceptualization of China's changing power. For the first time, the Alliance's 2022 Strategic Concept explicitly addressed the role of the PRC, qualifying the country's ambitions and policies as a serious challenge to Allied "interests, security and values."[5] However, the document did not designate China as a direct threat. It also stopped short of outlining how NATO should adjust its strategic posture.[6]

Against this backdrop, this study explores China's education strategy in Xi Jinping's 'new era' as a prism through which the intellectual architecture of its grand strategy can be discerned. Drawing primarily on official policy documents from the PRC Ministry of Education, this analysis evaluates China's education strategy by outlining its vision and milestones, identifying the ends and examining the means mobilized to pursue them. In so doing, the paper provides a snapshot of China's education development over the last decade, with a particular focus on the internationalization of China's higher education system, the challenges it faces and the resulting implications for NATO. The analysis locates the 'China challenge' primarily in non-traditional, non-military domains, where China's education strategy emerges as a key asset driving its technological primacy and reinforcing its global influence. Finally, this paper sets out recommendations to enhance the Alliance's cognitive readiness for 21st-century warfare as well as its preparedness to counter hybrid operations.

Decoding China's education strategy: vision and milestones

Since the establishment of Confucianism as state ideology during the Han dynasty (206 BCE-220 CE), education has been the bedrock of China's governance and ideological legitimacy. In today's China, it is regarded as a strategic pathway to the 'great rejuvenation of the Chinese nation,' decisive for the country's development and that of the Chinese Communist Party (CCP).[7] Extolled as the foundation of the 'Chinese dream,' education is framed as a guiding force of China's modernization and its 'renaissance' as a great world civilization. The centenary of the PRC's founding in 2049 – when China is expected to have become a 'prosperous, democratic, civilized, harmonious and modern socialist state' – is predicated on an innovation-driven development strategy that is fundamentally dependent on efforts to modernize education.

Following decades of rapid economic expansion, the PRC is gradually transitioning towards a "new national system" characterized by tighter control over capital allocation and the mobilization of "new quality productive forces" to secure breakthroughs in core technologies.[8] As China pursues self-reliance in science and technology (S&T), building a robust, multi-level education system capable of producing world-class innovators and talent has become central to advancing its industrial policy ambitions.[9] The strategic importance of education in this endeavour is vividly reflected in flagship initiatives such as *Made in China 2025*, the PRC's ambitious plan to transform the country into a manufacturing superpower, and its follow-up blueprint, *China Standards 2035*. The latter aims to set global benchmarks for emerging technologies including the Internet of Things (IoT), 5G and artificial intelligence (AI).

In China's vision, education modernization serves as the bridge connecting talent cultivation, knowledge production and technological innovation.[10] Recognizing the strategic role of education in Xi's long-term vision is therefore crucial for NATO. It illuminates the expanding pool of knowledge and expertise that China may draw on to develop new combat systems and enhance its military capabilities.

2 "More Chinese Receive Higher Education," The State Council of the PRC, accessed 31 October 2025, https://english.www.gov.cn/statecouncil/ministries/202205/18/content_WS62842db9c6d02e533532aced.html.

3 "2024 National Education Development Statistical Bulletin," (in Chinese), Ministry of Education of the PRC, accessed 31 October 2025, http://www.moe.gov.cn/jyb_sjzl/sjzl_fztjgb/202506/t20250611_1193760.html.

4 "China Ranking in the Global Innovation Index 2025," WIPO, accessed 31 October 2025, https://www.wipo.int/gii-ranking/en/china.

5 NATO, *NATO 2022 Strategic Concept* (Madrid: NATO, 29 June 2022), para.13.

6 Thierry Tardy, "Six Takeaways From NATO's New Strategic Concept," in *NATO's New Strategic Concept*, ed. Thierry Tardy (Rome: NATO Defense College, 2022), 11.

7 "Chen Baosheng: Education is of Decisive Significance to National Development," Ministry of Education of the PRC, accessed 31 October 2025, http://en.moe.gov.cn/features/70YearsofProgress/Remarks/201909/t20190929_401560.html.

8 "Xi Jinping: The Development of New Quality Productivity is an Intrinsic Requirement and an Important Focus for Promoting High-Quality Development," (in Chinese), Central People's Government of the PRC, accessed 31 October 2025, https://www.gov.cn/yaowen/liebiao/202405/content_6954761.htm.

9 "Xi Stresses Role of Education in Supporting Sci-Tech, Talent Development," Ministry of Education of the PRC, accessed 31 October 2025, http://en.moe.gov.cn/news/media_highlights/202503/t20250307_1181845.html.

10 "Working Together: Prioritizing Education Development and Transformation for a Better Future," Ministry of Education of the PRC, accessed 31 October 2025, http://en.moe.gov.cn/news/press_releases/202406/t20240616_1136019.html.

Three milestones define the trajectory of the PRC's education strategy in the medium to long term. The first is the establishment of the foundations of a high-quality education system by 2027. The second is the achievement of full educational modernization to become a strong country in education by 2035, which is a crucial midpoint towards the 2049 centenary goals. The third is to establish China as the global standard-setter and foremost destination for international education by 2049 (see figure 1).[11]

In parallel, Xi established a roadmap for developing China's ability to innovate. Long burdened by Western perceptions of the country as lagging behind in S&T, China has, under Xi Jinping's leadership, set ambitious targets to reverse this condition: by 2030, to build a talent system capable of cultivating innovation and attracting outstanding global expertise; by 2035, to secure a comparative advantage in talent competition across key fields, with China's high-level talent pools ranking among the world's foremost; and finally, to lay a solid talent foundation for building a modern, powerful, socialist country by 2049.[12]

As Xi remarked at the Central Talent Work Conference in 2021,[13] "the competition for comprehensive national strength is essentially a talent competition," and talent, Xi said, can only flourish in a competitive education system. According to the leadership's view, technological innovations from the 16th to the 20th century gravitated towards societies with strong development momentum and "high levels of civilization"– initially in Italy and subsequently in England, France, Germany and ultimately the United States.[14] Today, amid a new technological revolution, Xi sees China seeking to establish itself as a "world's talent centre and innovation highland," viewing education development as an indispensable choice for creating a better future.[15]

China's education and talent development targets are closely linked to the leadership's parallel ambitions for defence and the military industry. Pursuing a 'strong military' is seen as inseparable from building a 'strong country.' The aim is to build a modern military through integrated development in 'mechanization,' 'informatization' and 'intelligentization' by 2027, which marks the centennial

Figure 1. Where China's sees its future – integrated education, military and innovation strategy of the PRC (2027-2049). *Author's generation.*

11 "China Unveils Blueprint for Building Strong Education System by 2035," The State Council of the PRC, accessed 31 October 2025, https://english.www.gov.cn/policies/latestreleases/202501/20/content_WS678d85c6c6d0868f4e8eef83.html.

12 Ibid.

13 "Thoroughly Implement the Strategy of Strengthening the Nation through Talent in the New Era, and Accelerate the Building of a Major Global Centre for Talent and Innovation," (in Chinese), The State Council of the PRC, accessed 31 October 2025, https://www.gov.cn/xinwen/2021-12/15/content_5660938.htm.

14 Ibid.

15 For an official English-language summary of Xi Jinping's speech at the 2021 Central Talent Work Conference, see "Xi Calls for Accelerating Building of World Centre for Talent, Innovation," The State Council of the PRC, accessed 31 October 2025, https://english.www.gov.cn/news/topnews/202109/29/content_WS6153c339c6d0df57f98e108d.html.

of the founding of the People's Liberation Army (PLA); to complete 'full military modernization' by 2035; and to build a 'world-class military' by mid-century.[16]

Against this backdrop, professional military education has gained renewed significance. China's "new type" of military officer must possess university-level education, technical competence and the physical fitness required for modern, high-tech warfare.[17] To this end, the PRC Military Service Law (revised in 2021) extended the enlistment age to 24 for graduates of regular higher education institutions, and to 26 for postgraduate students.[18] Moreover, the new Regulation on Conscription Work states that priority should be given to graduates of colleges and universities.[19] China's military research apparatus has simultaneously undergone significant reform. The 77 colleges and universities of the PLA and the People's Armed Police were reorganized into 44 institutions, and a new Military Scientific Research Steering Committee and new research institutes and academies were created.[20] In May 2025, the Chinese defence ministry announced the opening of three military academies to cultivate high-quality, professional personnel: the PLA's Ground Force Service Academy in Hefei, Anhui province, the PLA Information Support Force Engineering University in Wuhan, Hubei, and the PLA Joint Logistics Support Force Engineering University in Chongqing.[21]

Since the 18th National Congress of the CCP, military-civil fusion – officially framed as the deep integration of defence and military modernization with economic and societal development – has become a key strategy for next-generation military-technological innovation.[22]

Within this framework, education modernization is considered an integral component of the same strategic enterprise, whose ends, means and ways are explored in the following sections.

The ends

The Chinese government issued two key documents about China's education modernization strategy in 2019: the *Implementation Plan for Accelerating the Modernization of Education (2018-2022)* and *China Education Modernization 2035,*[23] whose core objectives are outlined in the textbox below.

	The ten strategic tasks of China's education modernization
(i)	Make the study and implementation of 'Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era' a top priority
(ii)	Develop a high-quality education system 'with Chinese characteristics' and world-leading standards
(iii)	Promote high-quality education at all levels
(iv)	Achieve equal access to basic public education services
(v)	Build a lifelong learning system that serves all citizens
(vi)	Enhance the ability to cultivate top-notch talents
(vii)	Build a high-quality, professional and innovative teaching contingent
(viii)	Accelerate educational reform in the information age
(ix)	Create a new landscape of opening up education to the world
(x)	Advance the modernization of the education governance system and capacity

The overall objective is to create a "strong education system of socialism with Chinese characteristics" that will feature "powerful ideological and political leadership, talent competitiveness, a scientific and technological underpinning, livelihood security, social synergy and international influence," as further articulated in the *Outline of the Plan for Building an Education Powerhouse (2024-2035)* issued in January 2025 by the CCP Central Committee and the State Council.[24]

16 "Full Text: Resolution of the CPC Central Committee on the Major Achievements and Historical Experience of the Party over the Past Century," The State Council of the PRC, accessed 31 October 2025, https://english.www.gov.cn/policies/latestreleases/202111/16/content_WS6193a935c6d0df57f98e50b0.html.

17 "Xi Signs Order to Publish Regulations on Military Professional Education," Ministry of National Defence of the PRC, accessed 31 October 2025, http://eng.mod.gov.cn/xb/News_213114/TopStories/4875886.html.

18 "Law of the People's Republic of China on Military Service," (in Chinese), Ministry of National Defence of the PRC, accessed 31 October 2025, http://www.mod.gov.cn/gfbw/fgwx/15943603.html.

19 "Regulations on Conscription Work of the People's Republic of China,"(in Chinese), State Council and Central Military Commission, accessed 31 October 2025, https://www.gov.cn/zhengce/content/2023-04/12/content_5750986.htm.

20 "China's National Defence in the New Era," White Paper, The State Council Information Office, accessed 31 October 2025, http://english.scio.gov.cn/2019-07/24/content_75026800_5.htm.

21 "Spokesperson: China to Establish 3 New Military Academies," The State Council Information Office of the PRC, accessed 31 October 2025, http://english.scio.gov.cn/m/pressroom/2025-05/16/content_117878381.html#:~:text=The%20Central%20Military%20Commission%20%28CMC%29%20has%20decided%20to,talent%20training%2C%20a%20Chinese%20defense%20spokesperson%20said%20Thursday.

22 "Opinions on Promoting the Deep Integration of Military-Civil Fusion in the National Defence Science and Technology Industry," (in Chinese), The State Council of the PRC, accessed 31 October 2025, https://www.gov.cn/zhengce/content/2017-12/04/content_5244373.htm.

23 "The General Office of the Central Committee of the Communist Party of China and the General Office of the State Council issued the Implementation Plan for Accelerating the Modernization of Education (2018-2022)," (in Chinese), accessed 31 October 2025, https://www.gov.cn/zhengce/2019-02/23/content_5367988.

24 "The Central Committee of the Communist Party of China and the State Council issued the Outline of the Plan for Building an Education Powerhouse (2024-2035)," (in Chinese), accessed 31 October 2025,https://www.gov.cn/zhengce/202501/content_6999913.htm.

This document marks the country's first comprehensive national action plan to transform China into a global education powerhouse. It emphasizes the relevance of ideological education and the construction of a world-class university system to make China an independent and influential global knowledge hub. Pushing for the acceleration of the development of Science, Technology, Engineering and Mathematics (STEM) education institutions, the blueprint encourages high-level foreign campuses to offer programmes in China, introducing new majors such as intelligent maritime technology and interdisciplinary engineering designed to support Chinese high-tech industries, particularly those situated in the Guangdong-Hong Kong-Macao Greater Bay Area. At the same time, it calls for a more intense participation in global education governance, particularly in digital education.

At the core of these strategies lies the well-established role of education as "the grand plan of the country and the Party," centred on the fundamental questions of "who to cultivate, how to cultivate and for whom."[25] It is therefore necessary to explore how this framework is enacted in practice and to identify the mechanisms and means by which education is harnessed to advance national objectives.

The means

Unfolding against a backdrop of intensified conduct and anti-corruption campaigns across the Party and the Central Military Commission, China's education agenda comprises five core dimensions: patriotic education; national defence education; education 'with Chinese characteristics;' the internationalization of Chinese higher education; and digital education.

a.Patriotic education

Under Xi's leadership, patriotic education has emerged as a central principle of education policy at every level. The Patriotic Education Law,[26] adopted by China's National People's Congress in October 2023, formally incorporates programmes for studying the CCP's ideological work, particularly 'Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era.' Although children and students are the primary targets of ideological indoctrination, patriotic education is intended to permeate the whole of society, in service of the grand project of building a 'socialist spiritual civilization.' Within this vision, the PLA and China's People's Armed Police are responsible for implementing patriotic education in line with this law, promoting national reunification and opposing "Taiwan independence separatism."[27] The law even extends to "compatriots" from Hong Kong, Macao and Taiwan as well as to overseas Chinese, seeking to bolster their national spirit and harness collective power towards building a "stronger China." Shaping minds and sentiments thus has become central to the Party's effort to mould citizens who are ideologically aligned and emotionally mobilized to the cause of the 'Chinese Dream' of national rejuvenation.

b.National defence education

Closely linked to patriotic education, Xi's leadership sees national defence education as a central mechanism for cultivating 'socialist builders and successors.' Its purpose is to safeguard national identity against external threats and to reinforce loyalty to the Party and military preparedness. The revised National Defence Education Law,[28] which took effect in September 2024, has strengthened its practice in schools and incorporated military training in Chinese higher education institutions. Meanwhile, the PLA and the People's Armed Police have been tasked with dispatching military instructors to support national defence education activities, extending to all state organs, armed forces, enterprises, institutions and grass-roots self-government organizations. Overall, Xi's patriotic and defence educational campaigns have fostered a deep sense of nationalism among Chinese youth, with military service officially presented as a widely shared aspiration. Yet research suggests a more uneven reality, revealing divergent attitudes and, in some cases, outright resentment towards the programme, especially among urban students.[29]

c.Education 'with Chinese characteristics'

In a globalized world, preserving ideological unity while asserting a distinct 'China brand' in the global marketplace of ideas has become a key priority for the Chinese leadership. As "culture is the soul of a country and a nation," enhancing "cultural confidence" through ideological, political and moral education is seen as essential.[30] Strengthening 'cultural security' and building 'immunity' to foreign influence has thus developed into a pillar of national security.

The reintroduction of Chinese classical works and the resurgence of Confucian education are vivid manifestations of this conviction. In parallel, substantial efforts have been devoted to advancing the construction of philosophy and social sciences 'with Chinese characteristics.' In political science, for instance, this ambition has been most visi-

25 "Hold High the Great Banner of Socialism with Chinese Characteristics and Strive in Unity to Build a Modern Socialist Country in All Respects: Report to the 20th National Congress of the Communist Party of China," Central People's Government of the PRC, accessed 31 October 2025, https://www.gov.cn/xinwen/2022-10/25/content_5721685.htm.

26 "Law of the People's Republic of China on Patriotic Education," Central People's Government of the PRC, (in Chinese), accessed 31 October 2025, https://www.gov.cn/yaowen/liebiao/202310/content_6911481.htm.

27 Ibid.

28 "National Defence Education Law of the People's Republic of China," Central People's Government of the PRC, (in Chinese), accessed 31 October 2025, https://www.gov.cn/yaowen/liebiao/202409/content_6974369.htm.

29 Orna Naftali, "Youth military training in China: learning to 'love the army'," *Journal of Youth Studies*, 24, no.10 (2021): 1340-57.

30 *Study outline on Xi Jinping Thought on Culture* (Beijing: Xuexi Publishing House; People's Publishing House, 2024) (in Chinese): 1.

ble in the emergence of a 'Chinese School of International Relations' (IR), which challenges Western dominance over the discipline by advancing concepts drawn from China's history and philosophy.[31] This label, while not exempt from criticism within China itself, illuminates the pursuit of an independent epistemic space as well as the leadership's quest to enhance the country's 'discourse power.'

d.The internationalization of Chinese higher education

The tension between the cultivation of education grounded in the core values of 'socialism with Chinese characteristics' and the internationalization of China's education is at once constitutive of and challenging for its push to go global in higher education. Amid the securitization[32] of culture and education under Xi's rule, the internationalization[33] of China's higher education – encompassing student and faculty mobility, research cooperation, curriculum and programmes' internationalization and virtual learning – is at the forefront of the project to establish China as an education superpower under 'socialism with Chinese characteristics.' A key milestone in this 25-year process was the 2015 launch of the Double First-Class initiative. Building on the legacy of earlier projects such as Project 211 (1995) and Project 985 (1998), this initiative designated a select group of universities and disciplines which were to develop a world-class university system. By 2020, disciplines such as materials science reached world-class status, with significant advances also made in quantum science.[34]

According to The China Defence University Tracker,[35] at least 68 of the 147 universities that joined the Double First-Class initiative are supervised by China's defence industry agency – the State Administration of Science, Technology and Industry for National Defence – making use of the expanding civilian research and development base to accelerate military modernization. The declassification of 4,038 national defence-related patents in 2018 shows the integration between higher education and the defence sector, as Chinese universities and research institutes figured prominently among the top patent holders.[36] In Xi's 'new era,' military-civil integration is framed as a core responsibility of Chinese universities, which are expected to "contribute wisdom and strength to the realization of the Chinese dream and the strong army dream."[37]

The internationalization of PLA military academies has also become more prominent. In terms of outbound mobility, since 2012, the PLA has sent over 1,700 military personnel to study in more than 50 countries.[38] Notably, the National Defence University – the PLA's premier higher education institution – has established contacts with more than 100 countries and sent more than 2,500 scientists for training in overseas universities between 2007 and 2017.[39] The internationalization of China's higher education system functions as a strategic gateway into the global innovation ecosystem, a process that has been accelerated by the expansion of transnational education and education digitalization.

e.Digital education

In 2022, the Chinese Ministry of Education rolled out a comprehensive policy framework to advance digital education. The *2025 National Strategy for Digital Education*, along with China's *White Paper on Smart Education* pushes the integration of AI into the country's educational landscape to enhance digital literacy nationwide.[40] Top-tier Chinese universities such as Tsinghua University, Shanghai Jiao Tong University and the Harbin Institute of Technology have set up AI schools and launched AI general curricula. Establishing a tiered AI education system to guide students from foundational cognitive awareness to practical technological innovation is regarded as crucial to accelerating the transition from 'informatization' to 'intelligentization' – namely, the integration of AI into the PLA's command and decision-making processes. To support all this, institutional mechanisms are emerging to bridge academia, industry and the defence sector and ensure AI innovation resources are systematically shared. These include the establishment of research hubs such as the AI Military-Civil Fusion Innovation Centre in Tianjin and, reportedly, the High-End

31 See, among others: Tingyang Zhao, *All under Heaven: The Tianxia System for a Possible World Order*, trans. Joseph E. Harroff, foreword by Odd Arne Westad (Oakland: University of California Press, 2021); Xuetong Yan, *Leadership and the Rise of Great Powers* (Princeton: Princeton University Press, 2019); Yaqing Qin, *A Relational Theory of World Politics* (Cambridge: Cambridge University Press, 2018).

32 This trend refers to the 2014 introduction of Xi Jinping's 'comprehensive national security' concept, which expands security into non-traditional domains and elevates 'cultural security' alongside military, technological, and societal dimensions as a core 'guarantee' of national security.

33 The definition of the internationalization of higher education has been the object of intense scholarly debate over the last four decades, see Hans de Wit, "Internationalization in Higher Education: Critical Reflections on Its Conceptual Evolution," *International Higher Education,* 115 (2023): 14-16. Against the perceived universal application of Western-based definitions, Chinese scholars have advanced conceptualizations grounded in the domestic context; see, for example, Wei Liu, "The Chinese Definition of Internationalization in Higher Education," *Journal of Higher Education Policy and Management,* 43, no.2, (2021): 230-245.

34 "China to Further Promote the Double First-Class Initiative," Ministry of Education of the PRC, accessed 31 October 2025, http://en.moe.gov.cn/news/press_releases/202203/t20220301_603547.html.

35 "The China Defence Universities Tracker," ASPI, accessed 31 October 2025, https://www.aspi.org.au/report/china-defence-universities-tracker/.

36 Meia Nouwens and Helena Legarda, *China's Declassification of Defence Patents: Novel, but not (yet) a Game Changer*, (London: The International Institute for Strategic Studies, January 2018), 1-19.

37 "Follow the path of strengthening the military through science, technology, and culture; Serving the integrated development of the military and civilian sectors is the university's duty and mission," Ministry of Education of the PRC, (in Chinese), accessed 31 October 2025, http://www.moe.gov.cn/jyb_xwfb/s5147/201709/t20170928_315575.html.

38 "China's National Defence in the New Era," State Council Information Office of the PRC, (in Chinese), accessed 31 October 2025, https://www.gov.cn/zhengce/2019-07/24/content_5414325.htm.

39 "China's National Defence University builds ties with military academies in above 100 countries," Ministry of National Defence of the PRC, accessed 31 October 2025, http://eng.mod.gov.cn/xb/News_213114/TopStories/4821607.html.

40 "The "White Paper on Smart Education in China" and the launch of the National Education Digitalization Strategy Action 2.0," Ministry of Education of the PRC, (in Chinese), accessed 31 October 2025, http://www.moe.gov.cn/jyb_xwfb/xw_zt/moe_357/2025/2025_zt06/cgfb/202505/t20250507_1189603.html.

Laboratory for Military (Artificial) Intelligence at Tsinghua University, alongside initiatives spearheaded by the PLA's leading institutions for military science, such as the Academy of Intelligent Sciences and the National Innovation Institute of Defence Technology.[41]

Of all the aspects of China's education strategy, none carries greater implications for NATO and greater challenges for China itself than the internationalization and digitalization of its higher education. These pathways are examined in the next section.

The ways

China's internationalization of higher education primarily takes place through academic mobility, internationalization of curricula and programmes with overseas partners. The country's global reach, however, expanded significantly after the launch of the Confucius Institute (CI) project in 2004, aimed at promoting Chinese language and culture worldwide. Today, the CI network comprises 496 institutes and 757 Confucius Institutes Classrooms (CCs) in 160 countries, engaging over 1.25 million students worldwide.[42] In just two decades, the initiative's reach has outpaced all European cultural institutes, with the sole exception of the Alliance Française. The strongest presence is in Europe (183 CIs and 332 CCs), followed by Asia (143 CIs and 111 CCs), America (84 CIs and 193 CCs), Africa (67 CIs and 46 CCs), and Oceania (19 CIs and 75 CCs)(see figure 2[43]).

Unlike European cultural institutes, Confucius Institutes are typically established as joint ventures with foreign universities and are embedded into local administrative and normative structures. As such, they play a pivotal role in introducing Chinese language studies to universities where they were previously absent as well as consolidating their place within existing sinology departments. The Institutes' 'glocalization' has afforded them privileged access to foreign audiences while also enhancing the visibility of Chinese universities. Around 31% of Confucius Institutes' Chinese partner universities belong to the Double First-Class initiative, and many of them have established ties with the world's top universities.

In the Global South, where cooperation largely involves vocational institutions, Confucius Institutes have integrated language learning with skills training and workforce-oriented education. This approach aligns with the Belt and Road Initiative (BRI) framework and is another pathway to China's global academic power.

By launching the BRI, China has in fact positioned its higher education institutions to expand their reach, establishing new 'brain pathways' for human capital de-

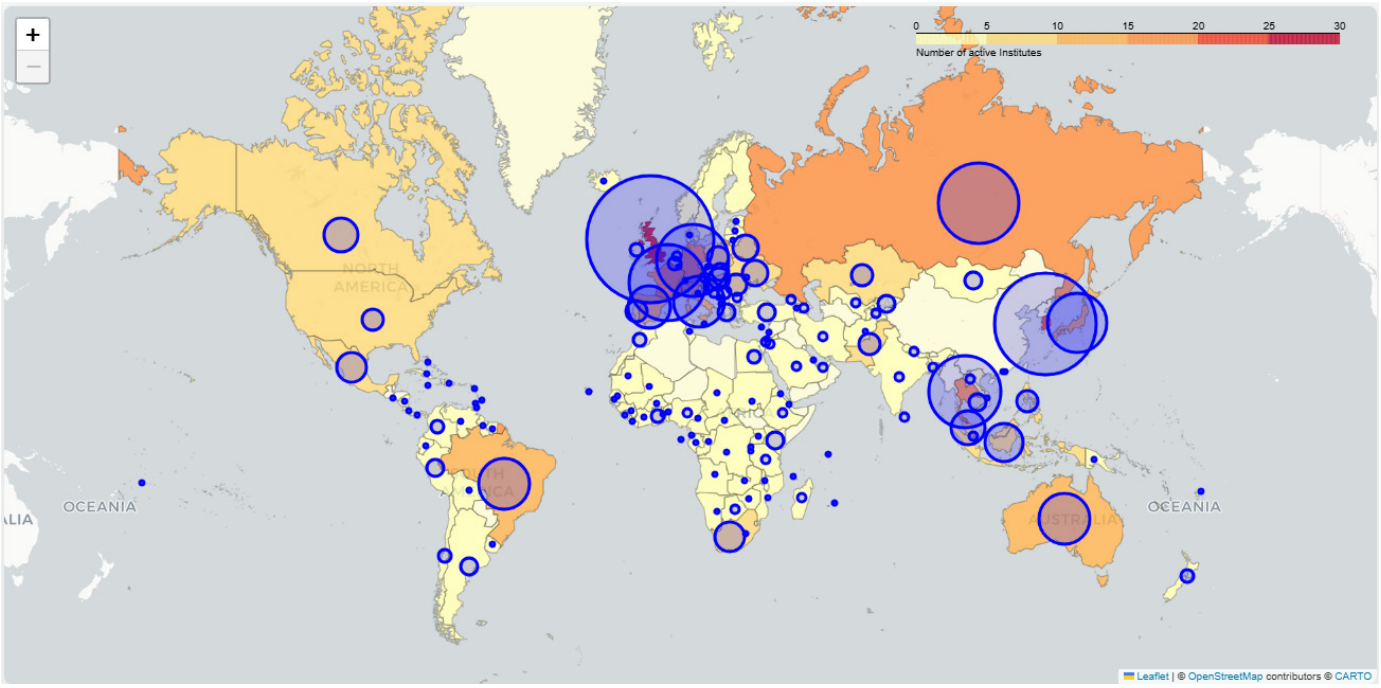

Figure 2. Confucius Institutes in the world as of 2024. Author's generation. The blue circles illustrate the geographical distribution and relative concentration of Confucius Institutes. For interactive visualization of the map and tracking the institutes' opening and closures in the world, visit the author's research repository: https://sprightly-tapioca-764f03.netlify.app/# .

41 Elsa B. Kania, *Chinese Military Innovation in Artificial Intelligence* (Washington, D.C.: U.S.-China Economic and Security Review Commission, 2019), 1-24.

42 "Confucius Institute Annual Development Report 2023," Chinese International Education Foundation (CIEF), accessed 31 October 2025, https://ci.cn/en/gywm/nb/15ac77fe-0c40-4c32-8f5a-4b3a3f0f149c.

43 This dataset was developed as part of the author's PhD research, titled *China's global role through cultural diplomacy: a study of Confucius Institutes.* It derives from original data collection and analysis undertaken as part of the dissertation project and reflects the methodological framework defined therein.

velopment. Since the initiative's inception in 2013, when President Xi introduced it at Nazarbayev University in Kazakhstan, the central role of academic institutions in advancing the BRI's objectives has been evident. Today, that same university is a member of the University Alliance of the Silk Road (UASR), a non-profit, non-governmental organization launched in 2015 by Xi'an Jiaotong University. Embracing the spirit of inclusion and mutual understanding of the ancient Silk Road, the Alliance seeks to deepen international cooperation in higher education through cultural exchange, talent development and joint scientific research involving over 150 universities, primarily polytechnics, from 37 countries. This so-called 'Academic Silk Road,' implemented through the Education Action Plan for the BRI,[44] is taking shape through various Chinese-led international networks, including the University Consortium of the 21st Century Maritime Silk Road and the New Silk Road Law Schools Alliance.

Beyond the routes of the New Silk Road, China has sought to expand its global educational presence through international networks such as the recent World Study Tour Alliance[45] and by establishing off-shore campuses. The most notable example of the latter is Fudan University's plan to establish a branch in Budapest, a project which has, however, been stalled due to strong public opposition in Hungary.[46]

Despite massive investment, the credibility of China's educational projection has suffered because of the changing perceptions of its rising power since the mid-2010s. This development has been compounded by Xi Jinping's more assertive foreign policy and the deepening integration of Chinese civilian and military R&D ecosystems. Research engagement with Chinese institutions is becoming ever more contested and difficult, particularly in Western democracies, due to growing national security concerns about the risks associated with dual-use research, intellectual property appropriation and political interference in collaborations. This is most evident in the widespread closure of Confucius Institutes, which culminated in the near-total dismantling of the network in the United States.[47]

The challenges

China's education strategy is not without challenges. Population aging poses one of the most significant constraints. Demographic projections indicate that the number of people aged 60 and over will surpass 400 million by 2033 while the proportion of working-age citizens shrinks.[48] As the population ages, Beijing will be compelled to explore new avenues for attracting foreign talent. To this end, the government has started to introduce corrective measures, including a new visa category for foreign talents (K visa), effective since 1 October 2025, aimed to attract young STEM specialists. Nonetheless, the PRC is facing persistent difficulties in attracting high-calibre international talent without prior connections to the country, due to China's restrictive immigration policies and an increasingly nationalist agenda in its S&T development.[49] Consequently, the disparity between the large outflow of Chinese students studying abroad and the comparatively limited inflow of international students studying in China remains significant. Moreover, although the Chinese government has been relatively effective in encouraging overseas Chinese students to return, these returnees do not typically represent the country's highest-tier talent.[50] Even in the field of AI, China faces a significant talent shortfall, expected to reach four million by 2030 (see figure 3).[51]

China also shows relative weaknesses in the social sciences, as its educational system does not sufficiently encourage the critical and creative skills essential for innovation and global competitiveness. Even in the hard sciences, China's rise has been driven primarily by scale, with uneven qualitative leadership across fields and continued deep embeddedness in existing publication and evaluation systems.

More fundamentally, the greatest challenge to China's ambition is the issue of trust. As geopolitical competition over technology intensifies, the securitization[52] of education and research ties with Chinese partner institutions in the name of 'de-risking' is increasing. However, this approach comes at a cost, primarily the risk of eroding the very 'China competence' needed to address the challenges that Beijing may pose to the Alliance and its members.

44 "Education Action Plan for the Belt and Road Initiative," State Council Information Office of the PRC, accessed 31 October 2025, http://english.scio.gov.cn/beltandroad/2016-07/13/content_76329464.htm.

45 "Connecting with the World: "Study at CAFA" Witnesses the Launch of the "Global Study Tour Alliance" Initiative," CAFA, accessed 31 December 2025, http://global.cafa.edu.cn/infoDetail/1/412.

46 "Budapest Protest Against China's Fudan University Campus," *BBC News*, 5 June 2021, accessed 31 October 2025, https://www.bbc.com/news/world-europe-57372653.

47 "With Nearly All U.S. Confucius Institutes Closed, Some Schools Sought Alternative Language Support," U.S. Government Accountability Office, accessed 31 October 2025, https://www.gao.gov/assets/d24105981.pdf; Flora Yan, Rachelle Peterson, and Ian Oxnevad, *After Confucius institutes. China's Enduring Influence on American Higher Education* (National Association of Scholars, 2022).

48 Li Jia, "From demographic dividend to talent dividend," *China Daily*, 31 May 2023.

49 Jeroen Groenewegen-Lau and Antonia Hmaidi, *Where China Stands in the Global Race for Talent* (Berlin: MERICS, 2024).

50 Ibid.

51 Wouter Maes and Alex Sawaya, "How Businesses Can Close China's AI Talent Gap," *Mckinsey & Company*, 5 May 2023.

52 In International Relations, securitization refers to the process through which an issue is framed as a security concern. Developed by the Copenhagen School, the concept emphasizes the role of political discourse in constructing security threats, as set out in Barry Buzan, Ole Wæver, and Jaap de Wilde, Security: *A New Framework for Analysis* (Boulder, CO: Lynne Rienner, 1998).

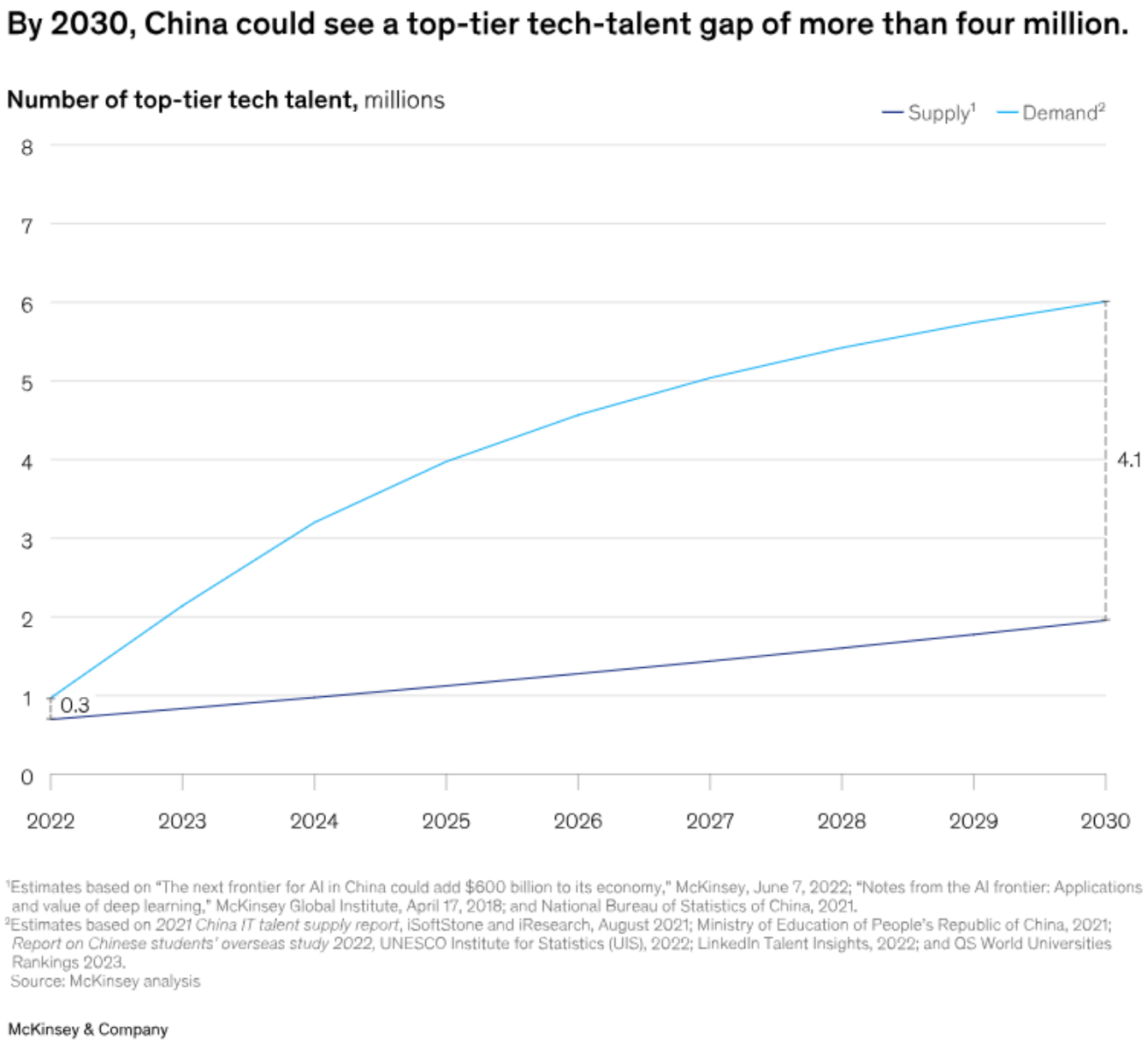

Figure 3. Projected shortage of top-tier tech talent in China. Source: McKinsey & Company.

What it all means

China's global education footprint leaves little doubt that the 'sleeping lion' has awakened and claims a leading role in global higher education governance. China is now the largest contributor to global research output and has ranked first for the number of scientific publications and citations in engineering & technology and the physical sciences since 2020.[53] In 2025, 13 Chinese universities secured a place in the top 200 global university ranking. China accounted for 346 universities in the top 2000 and surpassed the US for the first time.[54] Unsurprisingly, the PRC's innovation capabilities have surged, with the fastest growth rate in patents seen over the past 15 years.[55]

According to a report released by the Shenzhen-based data technology firm Dongbi Data,[56] China has also overtaken the US regarding the number of high-level science and technology experts. The total R&D government expenditure exceeded 3.6 trillion yuan (about 498

53 "Global Research Pulse: China," Springer Nature, accessed 31 October 2025, https://stories.springernature.com/global-research-pulse-china/index.html; "Country Rankings," Scimago Journal & Country Rank (2024), accessed 31 October 2025, https://www.scimagojr.com/countryrank.php?year=2024.

54 "QS World University Rankings 2025," QS Top Universities, accessed 31 October 2025, https://www.topuniversities.com/world-university-rankings/2025.

55 "Patents highlights," WIPO, accessed 31 October 2025, https://www.wipo.int/web-publications/world-intellectual-property-indicators-2024-highlights/en/patents-highlights.html.

56 Dannie Peng, "China Surpasses U.S. in Tally of Top Scientists for the First Time: Report," *South China Morning Post*, 17 January 2025.

billion US dollars) in 2024,[57] against approximately 209.7 billion invested in the U.S.[58] Around five million graduates in STEM subjects are produced each year, twice as many as India and ten times more than the US. As Kerry Brown suggests,[59] this constitutes China's greatest asset and the key to its technological dominance.

With over 30 million people learning Mandarin worldwide, the Chinese language market is expected to expand to 13.1 billion USD by 2027, making it the fastest-growing language market globally.[60] During the last decade, a 'new-type think tank with Chinese characteristics' has also risen to prominence. These think tanks contribute to expanding China's 'discourse power' by 'telling China's story well.' According to the *Global Go To Think Tank Report,*[61] Chinese think tanks represent 17% of the global total and play an increasingly influential role in setting the terms – and potentially even the language – of international political debate.

These trends suggest that global knowledge production is being rebalanced, with China becoming *an* agenda-setter, if not *the* agenda-setter, and reshaping the flows of talent and ideas that underpin the international order. Such a 're-Orientation' of the global centre of gravity in knowledge flows will likely challenge the West's traditional edge in defining the terms and meanings of the international security architecture. This becomes even more consequential with the emergence of cognitive warfare as the new battlefield, where competition extends beyond kinetic operations into struggles over influence, perception and control over minds and narratives.

As the PRC's educational power grows, so too does its ability to master the psycho-cultural domain – and with it, the ability to shape cultural, societal and personal values as well as the combat systems and forms of warfare that will define the future. In this emerging cognitive battlespace, victory will belong to those who design the most cognitively adaptive systems and respond the fastest to change. The human mind itself is at stake, given that education and research systems are increasingly operating as strategic infrastructures through which states exert influence over minds and perceptions. Investing in education means investing in cognitive advantage.

Consequences for NATO and the Allies

Whether or not China can overcome its challenges remains an open question. What is clear is that the outcome will not only shape the future of its own education system but also carry far-reaching implications for the international security environment and, consequently, for NATO. Tracing the development of China's education strategy is therefore essential to enable the Alliance to act proactively. In other words, NATO, to address the 'China challenge', must build awareness of the non-military dimensions entailed. With this in mind, this paper puts forward the following four recommendations:

1. Rethink NATO's 'China challenge.' NATO will have to anticipate and address challenges stemming from the PRC. This includes developing a systematic assessment of how China is developing its education, research and innovation ecosystem – essentially, of how China thinks about the future and prepares for it. If success in 21st century warfare is determined less by control of territory than by influence over intangible knowledge sources, China's emergence as a new centre of international higher education warrants careful consideration. This requires acknowledging that knowledge security is essential to NATO's capacity to deter and defend as well as recognizing that this may be a domain that China seeks to target.

2. Mapping China's knowledge flows to chart its global power trajectory. NATO could build autonomous capacity at its central level to map Chinese-led research networks and academic cooperation and assess whether and how these may be leveraged for dual-use purposes. Systematically benchmarking China's mobilization of talent and knowledge flows by creating an independent tracker system and repository on the methods and channels through which this occurs will enable NATO not only to anticipate challenges more effectively but also to reflect on NATO's own ways of educating for the future.

3. Securing 'China competence' amid education securitization. While the spillover effects of China's knowledge-driven rise require close monitoring, the securitization of academic exchanges poses an equally significant risk to NATO's ability to face future challenges with confidence. As expertise on China comes under strain, NATO can play a role in securing and strengthening shared expertise on the PRC among the Allies. This requires a whole-of-society approach to defence and resilience, engaging more closely with academia and the private sector to prioritize and pool expertise where it matters most. Knowledge is power, but only when shared. To lose shared knowledge on China is to lose foresight.

4. Minding the minds. For NATO to ensure that its military officers are properly prepared for future wars, education has to be treated as a top priority and a key enabler of the Alliance's three core tasks – deterrence and defence, crisis prevention and management and cooperative security. NATO's education and training institutions provide the

57 "China's R&D Spending Reports Rapid Growth in 2024," The State Council of the PRC, accessed 31 October 2025, https://english.www.gov.cn/archive/statistics/202501/23/content_WS6791e90fc6d0868f4e8ef19b.html.

58 "Federal Research and Development (R&D) Funding: FY2024," US Congress, accessed 31 October 2025, https://www.congress.gov/crs-product/R47564.

59 Kerry Brown, "Chinese Education and the Plan for Technology Dominance," King's College London News Centre, 23 May 2025, accessed 31 October 2025, https://www.kcl.ac.uk/news/chinese-education-and-the-plan-for-technology-dominance.

60 "UN Chinese Language Day: How Many People are Learning Chinese as a Foreign Language?," *CGTN,* 19 April 2024.

61 James G. McGann, *2020 Global Go To Think Tank Index Report* (Philadelphia: University of Pennsylvania, Think Tanks and Civil Societies Program, 2021), accessed 31 October 2025, https://repository.upenn.edu/entities/publication/9f1730fa-da55-40bd-a1f4-1c2b2346b753.

space to cultivate the critical thinking necessary for securing the intellectual edge that underpins competitiveness, adaptability and cohesion. Institutions such as the NATO Defense College, the NATO School Oberammergau, the NATO Communications and Information Academy, NATO's Centres of Excellence and national military academies and war colleges across Allied countries are all incubators of talent and tomorrow's leaders. Enhancing their capacity to nurture minds that are alive, alert and ahead while expanding schemes such as the Young Professionals Programme[62] into specialized areas of competence, including with regard to China, will be crucial to attracting and developing highly talented professionals within and beyond NATO's organizations.

Tomorrow's wars will not be defined by one single region or actor. It is not just about the 'China challenge,' it is the challenge of our time. Cognitive warfare spans Beijing, Moscow, Tehran and Pyongyang; targeting what defines us most: the human mind. Investing in education and fostering 'human interoperability' is not just about NATO's brainpower but about shaping the very future in which NATO will have to operate.

62 NATO's Young Professionals Programme (YPP) is a three-year entry-level career programme designed for highly talented young professionals to gain experience within NATO bodies, with a possible extension of up to three years. The programme provides a potential pathway for strengthening NATO's human capital and specialized knowledge base.

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