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An Analytical Study of Zoomers Activism in the Digital Age: Iran's Gen Z and Role of Youth's Progress in South Asia

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ABSTRACT

Zoomers (also sometimes known as Generation Z, post-Millennials, Homelanders or iGeneration for those born between 1997-2012) represent a pivotal demographic group that is reshaping South Asian (SA) societies through unprecedented digital connectivity and evolving cultural patterns. This study examines how South Asian zoomers engage with traditional values, literature, religion, and technology while comparing their experiences with Iranian youth who, despite facing structural challenges—including economic and technological sanctions—remain highly engaged in the digital world and activism. Through a mixed methods analysis integrating quantitative indicators from the Global innovation Index, digital adoption statistics and socioeconomics data across countries of SA including Bangladesh, Iran, India, Sri Lanka and Pakistan, the research addresses the issue of whether this generation is threatening cultural preservation or accelerating adaptive evolution. The findings suggest that SA's Gen Z navigates a paradoxical landscape- selectively preserving cultural heritage while embracing digital modernity but facing systemic barriers to technological advancement, including infrastructure shortages (internet penetration ranges from 31.1% in Pakistan to 84.1% in Iran), skills mismatches, and limited economic opportunities. The innovation gap with developed countries remains significant: The South Asian region invests 0.03-0.64% of their GDP in research and development as compared to 2.85% in developed economies while researchers per capita are 17-56 times lower. However contrasting strength emerges including 93% adoption of generative AI among Indian students and leadership in ICT services exports. The study suggests evidence-based interventions including curriculum reform with an emphasis on practical skills, global broadband initiatives, venture capital ecosystem development and programs that integrate tradition and technology. These recommendations aim to accelerate regional development and optimize demographic dividend while respecting cultural authenticity.

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Introduction

Zoomers (also referred to as Generation Z, post-Millennials, Homelanders, or iGeneration for those born between 1997 and 2012) number approximately 2.1 billion worldwide and represent humanity's first truly digital-native cohort. This generation is fundamentally distinguished by lifelong immersion in technology, which shapes cognitive patterns, social interactions, and cultural expectations (Francis & Hoefel, 2018; Mohammadi, 2018). In South Asia (SA)—comprising more than 400 million Zoomers across India, Pakistan, Bangladesh, Sri Lanka, and neighboring countries—this demographic faces a distinct developmental tension between rapid technological transformation and deeply rooted cultural traditions that span millennia. Unlike their Western counterparts, who have inherited established digital infrastructures, stable governance systems, and mature innovation ecosystems, South Asia's Gen Z confronts infrastructural constraints, economic inequalities, inadequacies in education systems, and complex sociocultural expectations that significantly shape their developmental trajectories and life outcomes.

The need to understand this generation arises from an unprecedented population concentration that coincides with critical development milestones. Nearly one-third of SA's population consists of individuals under the age of 25, making the region home to the world's largest youth population. The implications of this situation over the next decade will depend on the policies adopted and may result either in significant opportunities or in serious challenges in the form of demographic burden. (Bloom and Williamson, 1998; ILO, 2024) Current trajectories reveal worrying patterns: youth unemployment is at 17 percent in India and significantly higher in Pakistan and Bangladesh; skills mismatches are leaving millions educated but unemployed; brain drain is accelerating as talent seeks job opportunities abroad; And social unrest is manifesting itself through protests in Bangladesh (2024), Nepal (2025) and repeated demonstrations across the region (Stimson Center, 2025). These developments demonstrate that conventional approaches to demographic scale and generational expectations are inadequate.

The Iranian experience offers instructive parallels for understanding generational dynamics in traditional societies undergoing rapid modernization while confronting governance challenges. Iran's Generation Z—often referred to as the "eighties" (those born in the 1380s in the Iranian calendar, corresponding to the 2000s)—has demonstrated notable resistance to ideological conformity while using digital platforms to challenge established norms and simultaneously maintain connections to Iran's cultural heritage (Livingstone, 2017; Khosravi, 2008). Following the death of Mahsa Amini in September 2022, Iran's Generation Z led unprecedented protests across 31 provinces, with teenage girls publicly removing their hijabs and chanting "Women, Life, Freedom"—acts that would have been unthinkable for many in previous generations (Doostmohammadi & Abbaszadeh, 2024; Tohidi, 2023). This pattern of simultaneous cultural negotiation and digital activism resonates across South Asia, revealing shared mechanisms of generational adaptation in traditional societies facing modernization pressures. Against this backdrop, this research addresses five critical questions related to regional development and cultural preservation: (1) Are members of Generation Z in South

Asia abandoning traditional values, literature, and religious practices, or are they selectively adapting them? (2) How does their level of technology adoption compare quantitatively with that of developed countries, and what factors explain any observed gaps? (3) What structural barriers—educational, infrastructural, economic, and regulatory—limit innovation potential despite a large youth population? (4) What evidence-based policy interventions can accelerate beneficial transformation while preserving cultural authenticity? (5) What lessons can South Asian nations draw from the experiences of Iran's Generation Z regarding youth engagement, cultural preservation under pressure, and the consequences of limited opportunities?

Research hypothesis. The study advances a single integrated hypothesis: Generation Z in South Asia, with Iran as the region's pivotal reference case, is neither abandoning cultural heritage nor failing to adopt modern technology, but is instead pursuing a strategy of selective cultural retention combined with bifurcated technology adoption, the outcome of which is jointly determined by three mechanisms operating simultaneously — (i) a redistribution of cultural-transmission channels in which digitally-mediated horizontal transmission expands at the expense of state- and family-mediated vertical and oblique channels, (ii) a divergence in the diffusion of innovations between rapid consumer-side adoption and stalled production-side adoption, conditioned by institutional compatibility rather than individual aptitude, and (iii) an absorption gap in which accumulated human capital outpaces the labour-market and governance capacity to convert it into productive output, so that the demographic dividend is at risk of inverting into a demographic burden. The study further hypothesises that the rate at which these three mechanisms unfold is moderated by each society's state–religion configuration, that Iran — in which the mechanisms have advanced furthest — is the calibrated reference case for projecting the South Asian trajectory, and that the resulting developmental outcome therefore depends not on cultural disposition but on whether the absorption gap is closed within the demographic window of approximately fifteen to twenty years identified by Mason and Lee (2006).

The main findings reveal an admixture of realities that contradict simplistic narratives of total abandonment of culture or technological backwardness. Rather than general rejection, South Asian Gen Z engage in selective retention of culture: 78–84% participate in religious festivals (though often emphasizing cultural rather than doctrinal aspects), 88–92% respect elders (while negotiating boundaries of authority), and 83–88% maintain regional language proficiency in oral communication (though written literacy is declining). At the same time, this generation is rapidly embracing available technologies: India leads Asia-Pacific in adoption of generative AI, with 93% of students, mobile connectivity has surpassed 85% in most countries, and social media use is changing patterns of political engagement and cultural expression.However, fundamental innovation gaps persist compared to developed countries. South Asian countries invest 5 to 96 times less in research and development as a percentage of GDP, employ 17 to 55 times fewer researchers per person, generate 94 to 1,870 times fewer patents per person, and export 3.7 to 59 times fewer high-tech products. These disparities stem not from individual deficiencies but from structural barriers: inadequate education systems that emphasize rote memorization rather than practical skills, infrastructure

deficiencies including unreliable electricity and expensive internet access, limited access to venture capital that constrains entrepreneurship, regulatory hurdles that take 17 to 36 days to register a business, and cultural attitudes that stigmatize business failure.

The study proposes six categories of evidence-based interventions rooted in successful implementations in developing economies: (1) transforming the education system with an emphasis on project-based learning, exposure to undergraduate research, integration of professional training, and professional development of teachers; (2) developing infrastructure including affordable universal broadband (targeting less than 4% of household income), modernizing the electricity grid to achieve 98.05% reliability, and innovation infrastructure in tier-two cities; (3) developing the startup ecosystem through government-backed venture capital funds, simplifying regulations that allow for the formation of 48-hour companies, and supporting university incubators; (4) increasing investment in research and development from the current 0.04-0.65% to 1.6-2.6% of GDP over 11 years; (5) Integrating cultural values through tradition-technology integration programs, family-friendly innovation policies, and digital culture preservation initiatives; (6) Eliminating the gender digital divide through targeted interventions given the acute inequalities in South Asia where women have 45-63% less access to digital technologies than men.The following analysis combines quantitative innovation metrics, digital adoption data, cultural practices surveys, and comparative case studies with particular emphasis on the Iranian experience, to develop a comprehensive picture of the current conditions and future trajectories of Gen Z in SA. By examining emerging challenges and opportunities, the research aims to help develop policies that optimize demographic gains while respecting cultural authenticity, and ultimately determine whether South Asia's massive youth cohort will become an engine of regional progress or a source of enduring instability and lost development potential.

Literature Review

Global Characteristics of Generation Z

Contemporary research identifies several distinct characteristics of Generation Z across cultural contexts, although most research focuses on Western populations, leaving gaps in knowledge about non-Western manifestations. This group demonstrates high digital fluency, has integrated technology into daily life from early childhood, and has developed distinct cognitive patterns compared to previous generations (Similler & Grace, 2016; Twenge, 2017). Prensky (2001) coined the notion of "digital natives" to describe individuals who have never experienced life without digital technology, although critics argue that this concept oversimplifies the diverse access to technology and levels of competence. Generation Z exhibits pragmatic career orientations, prioritizing financial security while simultaneously valuing purposeful employment—a combination that reflects the economic uncertainty experienced during their formative years, marked by the 2009 financial crisis, the COVID-19 pandemic, and the resulting disruptions to the labor market (Deloitte, 2024). Mental health awareness characterizes their discourse, with psychological challenges openly discussed, distinguishing them from previous generations who remained silent about mental health issues. Extensive research by Twenge (2017) documents rising rates of depression, anxiety,

and loneliness among Generation Z, despite unprecedented connectivity, and attributes these patterns in part to increased social media use. Reduced face-to-face interaction and increased performance pressures due to constant digital comparisons. Politically, Generation Z is more active on climate change, social justice, and systemic inequality, and uses digital platforms for mobilization and advocacy (Wiederhold, 2021). Their information consumption patterns favor visual, short-form content delivered through platforms such as TikTok, Instagram, and YouTube, with their average attention span reportedly reduced to 8 seconds for initial content evaluation (Microsoft, 2015). However, these statistics need to be contextualized: Generation Z shows sustained attention to engaging content while quickly filtering out irrelevant information—an adaptive strategy for information-saturated environments rather than a cognitive deficit.

Generation Z in Iran: A Comparative Framework

Iran's Generation Z offers important insights into understanding generational dynamics in traditional societies that are under modernization pressures while also facing governance challenges and international isolation. This group, estimated to number 15.7–18.1 million (approximately 18–23 percent of Iran's population of 86 million), exhibits fundamentally different characteristics from previous Iranian generations that experienced the Iran–Iraq War (1980-1988), the 1979 Islamic Revolution and the subsequent postwar reconstruction era that collectively shaped their worldview (Khosravi, 2008; Ashayeri, et al, 2024).Torbati (2023) observes and states that Iran's Generation Z rejects the ideological idealism that characterized earlier groups and instead exhibits a pragmatic individualism, openly challenging the religious and political authority structures that previous generations accepted or privately questioned. This shift reflects several converging factors: economic hardships, including youth unemployment of over 25 percent, inflation that reduces purchasing power, and limited career advancement opportunities; digital connectivity that allows exposure to global lifestyles and alternative governance models; and a generational gap from the revolutionary fervor that drove their grandparents' generation.Danesh, Nasrabadi and Abdellahi (2014) showed the widening generation gap in Iran. Economic pressures, digital connectivity, and exposure to global cultural flows have fundamentally altered the expectations and values of young people. This study identifies five key areas of divergence: religious practices, marriage, career expectations, political participation and cultural consumption.

The 2022–2023 protests following the death of Mahsa (Zina) Amini in police custody after an alleged violation of hijab regulations drew significant participation from Iran's younger generation, particularly members of Generation Z. Demonstrations, spread across all 31 provinces, with participants chanting "Zan, Zendegi, Azadi" (Woman, Life, Freedom) and expressing their views in various public and symbolic ways (Doostmohammadi & Abbaszadeh, 2024; Tohidi, 2023). These events highlighted an ongoing generational conversation within Iranian society about social norms, personal expression, and the role of tradition in contemporary life. At the same time, many observers note that Iran's Generation Z continues to maintain strong connections to the country's cultural heritage. Alongside debates about social practices such as the observance of hijab, many young Iranians actively engage with

long-standing elements of Persian culture. They celebrate Nowruz (the Iranian New Year) and other historical traditions, draw inspiration from classical literary works such as the *Shahnameh* (Book of Kings), and express pride in Iran's rich cultural legacy (Agha Mohammadi, 2025; Khosravi, 2008). Social media platforms frequently feature the poetry of Hafez, Rumi, Saadi, and Ferdowsi reinterpreted by younger audiences, illustrating how cultural continuity can persist through adaptation and reinterpretation rather than abandonment.

Agha Mohammadi's (2025) research on the identity formation of Iranian youth shows that Generation Z increasingly sees themselves as the heirs of 2,550 years of Iranian civilization, rather than the legacy of the 1979 revolution, with Iranian nationalism rather than Islamic revolutionary ideology. This identity realignment has profound political implications, as it delegitimizes the ideological claims of the Islamic Republic while providing alternative bases for national identity. However, his cautions against interpreting this as simple secularization: many Iranian Generation Z maintain their private spiritual practices, while rejecting state-mandated religious observance and distinguishing between faith and theocracy. Khosravi's (2008) ethnographic work on the instability of Iranian youth documents how economic deprivation and limited opportunities create what he calls "waiting periods"—long periods of delay in adulthood in which young people are unable to achieve marriage, independent housing, or job creation due to structural constraints. This instability creates frustration and anger toward systems of government that are seen as obstacles to generational progress, creating the conditions for periodic outbursts of protest, despite the risks of violent repression.The Iranian experience offers several instructive lessons for South Asian contexts: (1) digital connectivity enables rapid mobilization and norm-breaking despite state constraints; (2) providing economic opportunities to channel youth energy constructively rather than adversarial is essential; (3) cultural preservation can coexist with modernization when youth perceive respect for heritage rather than imposed conformity; (4) generational gaps widen rapidly when youth expectations diverge significantly from parental experiences; (5) educated populations with limited opportunities become a source of instability rather than development.

Generation Z in South Asia: Regional Characteristics

Wignall, Brown, & Ahmed (2024)'s research shows that South Asia's Generation Z operates in distinct socio-economic contexts that differentiate their experiences from their Western and Iranian counterparts, while sharing some commonalities with other developing regions and according to Stimson Center's report (2025), almost One-third South and Southeast Asia's population is under the age of 25, placing enormous demographic pressure on education systems, labor markets, healthcare infrastructure, and social services. This increase in young populations presents two possibilities: a demographic dividend if properly utilized through human capital investment and job creation, or a demographic burden if opportunities do not match population growth. Economic instability defines their situation across the region. Youth unemployment rates in India are as high as 18% and in Pakistan and Bangladesh it is estimated at 21–26%, while those in employment often face underemployment in the informal sector with no security, benefits or opportunities for advancement (ILO, 2024; World Economic Forum, 2025). Skills mismatches – where qualifications are not aligned with

market demand – are creating a generation that is both overeducated and underqualified for available job positions. India produces approximately 1.6 million engineering graduates annually, yet industry reports suggest that only 24–32% of them have immediately employable skills and most require significant retraining before they can be productively deployed (National Association of Software and Services Companies, 2023).Digital adoption shows inconsistent patterns, indicating uneven development. While India ranks first in the adoption of generative AI in Asia-Pacific, with 93% of students and 84% of employees actively engaging with technologies such as ChatGPT, Bard and other platforms (Deloitte India, 2024), fundamental gaps in digital infrastructure remain. In Bangladesh, internet penetration was only 44.6% in early 2024, and social media usage was 30.5% of the total population (Data Reportal, 2024). Internet penetration in Pakistan remains at 32.2%, although mobile connections are reaching 89.3% of the population, indicating the use of mobile phones rather than smartphones for many users.

Gender-based inequalities substantially widen these disparities. Across South Asia, Adolescent boys are 1.6 times more likely to own a mobile phone and twice more likely to own a smartphone compared to girls (UNICEF, 2024). Women in India (ages 15–66) are 45.5% less likelythan men to own a mobile phone, while in Bangladesh women are more than 64 % less likely to use internet services (Learn Asia, 2019). Pakistan exhibits particularly acute gender-based digital where restrictive social norms limit women's mobility and decision-making authority, resulting in digital exclusion that exacerbates educational and economic inequalities. These patterns are indicative of broader gender inequalities: women's involvement in economic activity remains only 25.3% in India, 23.9% in Pakistan, and 37.5% in Bangladesh, compared with 61-72 percent in developed economies.Educational attainment shows improvement but concerns about quality persist. Literacy rates have increased significantly: India has achieved 78.8% literacy (2021 census), Bangladesh 75.6% (2022) and Sri Lanka 92.3% (2019). However, learning outcomes lag significantly behind inputs. ASER (2023) data form India shows that just 41.9% of fifth graders can read 2nd grade texts, while only 25.9% can do basic division-suggesting that enrolment does not guarantee functional literacy or numeracy. Similar patterns emerge across the region, with rote memorization dominating education and performance in exams taking precedence over conceptual understanding or practical application.Migration aspirations reflect limited domestic opportunities. Surveys show that 49% of young Indians aged 18-27 are willing to migrate for better opportunities (Stasis Consulting, 2021), and similar proportions are found across Pakistan, Bangladesh and Sri Lanka. Destination preferences favour Canada, Australia, the US, the UK and the Gulf countries, using routes including student visas, skilled worker plans and irregular migration. This brain drain deprives South Asian countries of precisely the educated and ambitious individuals who can drive innovation and entrepreneurship – creating vicious cycles where lack of opportunities drives talent migration, further limiting the capacity for innovation.Religious and cultural landscapes exhibit complexities that defy simplistic descriptions. South Asia includes Hindu-majority India and Nepal, Muslim-majority Pakistan and Bangladesh, Buddhist-majority Sri Lanka and Bhutan, and diverse

religious populations across the globe. G Z in these contexts maintains significant levels of religious identity and practice, while increasingly questioning some traditional practices. Participation in festivals remains high: 79–85 percent of South Asian Generation Z's report regular participation in Diwali, Eid, Vesak, and other religious celebrations, although interpretations increasingly emphasize cultural celebrations and family connections over adherence to teachings (Pew Research Center, 2023).

Theoretical Framework

This analysis uses a multi-theoretical approach that integrates cultural transfer theory, diffusion of innovations theory, and demographic dividend frameworks to comprehensively explain the development patterns of Generation Z in South Asia.

Cultural transmission theory

As proposed by Cavalli-Sforza and Feldman (1981) and later elaborated by Richerson & Boyd (1985) cultural transmission theory posits that cultural elements-including values, practices, knowledge, and beliefs are transmitted between generations through three main mechanisms: vertical (parents to children) and horizontal (peer-to-peer) transmission as well as transmission through indirect means (from non-parental members of previous generations, including teachers, religious leaders, and community elders). Each mode of transmission has a different rate of fidelity, such that vertical transmission typically maintains higher cultural continuity while horizontal transmission allows for more rapid change.Zoomers unprecedented digital connectivity fundamentally alters the dynamics of transmission, dramatically enhancing horizontal transmission while potentially weakening vertical transmission. Social media platforms, online communities, and digital content enable ongoing peer-to-peer cultural exchange across geographic and social boundaries, exposing young people to diverse value systems and practices beyond the influence of parents and society. Iranian research illustrates this pattern: His documents how Instagram, Telegram, and circumventing internet restrictions have enabled Iranian's zoomers to access global cultural content, connect with immigrant communities, and create alternative reference groups that challenge state-promoted values.However, cultural transfer theory predicts selective cultural substitution rather than general cultural substitution. Richerson and Boyd (2005) argued that cultural evolution operates through biased transfer, where individuals selectively adopt cultural elements based on perceived utility, prestige, and considerations of conformity. Applied to South Asian contexts, this suggests that Generation Z will retain cultural elements that provide identity, community connection, and practical value, while modifying or rejecting elements that are perceived as restrictive, irrelevant or inconsistent with contemporary circumstances.

Diffusion of Innovations Theory

Rogers's (2003) theory presents the diffusion of innovations theory which offers a framework for examining how technologies are adopted within populations. The theory outlines 5 adopter categories along a bell-shaped curve, ranging from innovators (2.5%) and early adopters

(13.7%) to the early majority (36%), late majority (39%) and laggards (19%). The adoption rate is determined by 5 perceived features of an innovation: comparative advantage, compatibility, complexity, potential for experimentation and visibility of outcomes.South Asian countries are at different points on the adoption curve of different technologies, influenced by access to infrastructure, economic resources, educational levels, and cultural attitudes toward innovation. India's leadership in adoption of generative AI (93% among students) indicates rapid progress along the adoption curve for technologies with high perceived comparative advantage and low barriers to experimentation (most AI tools are free or low cost). Conversely, the slow penetration of broadband despite falling costs suggests that infrastructure constraints, not adoption attitudes, are limiting access to this technology.The theory's S-curve pattern—slow initial adoption, rapid acceleration during mainstream adoption, and eventual saturation—helps explain the uneven development of technology across South Asia. Early adopters are concentrated in urban, educated, and affluent sectors with access to infrastructure, while the late adopters and laggards continue to be constrained by economic, infrastructural, and knowledge barriers. This creates dual patterns of development in which elite sectors advance rapidly while the majority of the population is essentially left behind.

Theory of the demographic dividend

Bloom and Williamson's (1998) theory of the demographic dividend suggests that nations with a high proportion of working-age individuals compared to dependents can achieve faster economic growth when certain conditions are met. This dividend manifests via three channels: an expanded loads, an improved human capital through greater investment in each child's health and education.However, realizing the demographic dividend requires supportive conditions: productive job opportunities that absorb the growing labor supply, education systems that provide relevant skills, quality governance that enables investment and entrepreneurship, and macroeconomic stability. Without these conditions, large young populations become a demographic burden rather than a benefit-unemployed or underemployed populations that consume resources without a corresponding productive contribution, creating fiscal pressures and social instability.The large Generation Z cohort in South Asia represents a potential demographic dividend of historical proportions, comparable to the East Asian experience during the decades 1971–1991, when economies including South Korea, Taiwan, Singapore, and China achieved sustained high growth partly through demographic advantages (Bloom et al., 2000). However, current trajectories suggest that South Asia is at risk of missing this opportunity: youth unemployment, skills mismatches, limited investment in education and infrastructure, and inadequate job creation all suggest that the conditions for the demographic dividend to materialize are not in place.Mason and Lee's (2006) life-cycle deficit framework extends the analysis of demographic dividend by examining age-specific patterns of consumption and production. Their research shows that demographic dividend depends crucially on timing: countries need to exploit their productive capacity during periods of peak working age, before population aging unfavorably shifts the balance. For South Asia, the time frame for demographic dividend realization is

approximately 16–21 years, before population aging limits the urgency of generating growth for immediate policy action.

Methodology

This study uses a mixed methods approach to present a clear and balanced picture of the developmental patterns, cultural orientations, and future prospects of Generation Z in South Asia. Combining quantitative data with qualitative insights, the research strengthens its conclusions by cross-examining evidence from multiple sources. In the quantitative section, innovation performance is examined using the Global Innovation Index 2024 published by WIPO, Cornell University, and INSEAD, which assesses both innovation inputs and outputs. Digital adoption trends are analyzed through DataReportal 2024 country reports supported by data from the World Bank, GSMA, and national telecommunications authorities. Youth employment patterns are studied using ILO regional reports, national labor force surveys, and World Economic Forum data. Education indicators are extracted from UNESCO and ASER, while technology use and investment in R&D are measured using GSMA, UNESCO, WIPO and major publication databases. Qualitative analysis provides further depth to the topic through academic studies, regional media sources, policy documents and international surveys such as Pew and Deloitte. The study uses comparative statistical analysis, trend analysis, thematic coding and comparative case studies using Iran as a reference case. Finally, gap analysis compares the current situation with international benchmarks to identify practical policy priorities. Theory is not used here as background framing alone: each of the three frameworks — cultural transmission, diffusion of innovations, and the demographic dividend — is operationalised in the Analysis through indicator-level interpretation, with Iran serving as the anchoring case against which the South Asian indicators are read. Cultural-transmission theory is applied to the channel-redistribution evident in Iranian survey and protest data; diffusion theory is applied to the divergence between Iran's consumer-technology adoption rates and its production-side innovation indicators; and the demographic-dividend framework is applied to the absorption gap between Iran's human-capital stock and its labour-market outcomes. This indicator-to-theory mapping is the analytical mechanism by which the comparative case generates regionally relevant inference. This methodology faces several inherent limitations that need to be acknowledged:

Variability in data quality: South Asian countries show varying statistical capacity, with some indicators lacking recent updates, consistent definitions across countries, or poor national detail. Pakistan and Bangladesh, in particular, show data gaps compared to India's more comprehensive statistical systems.

Digital divide in survey representation: Youth surveys, increasingly conducted online, may underrepresent digitally deprived populations and potentially overestimate progressive attitudes and technology acceptance among Gen Z by sampling primarily from the connected segments.

Interpreting the cultural context: Theoretical frameworks of western origin may incompletely capture the cultural dynamics of South Asia, which requires careful contextualization and validation against regional research.

Rapidly changing dynamics: Generation Z characteristics and technology adoption patterns are rapidly evolving, meaning that even 3-4 year old data may not reflect current realities, especially for fast-changing indicators like AI adoption.

Limitations of the Iran-South Asia comparison: Although the Iranian experiences offer valuable insights, fundamental differences in governance systems, international relations, and specific cultural contexts limit the direct transferability of findings.

To address these limitations, this analysis: (1) triangulates findings across multiple data sources and methodological approaches; (2) explicitly acknowledges uncertainty where data limitations limit confident conclusions; (3) integrates regional research to validate Western theoretical applications; (4) prioritizes recent data (2022–2024) for rapidly changing indicators; (5) identifies structural similarities rather than assuming direct transferability between Iranian and South Asian contexts.

Findings

Global Innovation Index Performance: South Asian Country Rankings

The Global Innovation Index 2024, published by WIPO in partnership with Cornell University and INSEAD, evaluates 134 economies based on 79 indicators measuring innovation inputs- such as institutions, human capital and research, infrastructure, market sophistication, business sophistication- and outputs including knowledge and technology outputs, creative production. SA countries show considerable variation in performance, reflecting both progress and ongoing challenges.

Table 1. Assessment of South Asia Nations in the 2024 GII (Global Innovation Index)

Country	Global Rank	Regional Rank (Central & Southern Asia)	Economic Calssification	Key Strengths
India	39	1	Lower-middle-tier economics	ICT services exports (1st globally), venture capital, intangible assets
Iran	64	2	Lower-middle-tier economics	Scientific publications, trademark registrations
Kazakhstan	78	3	Upper-middle-tier-economics	E-government services (9th globally), e-participation
Uzbekistan	83	4	Lower-middle-tier economics	Government efficiency improvements
Sri Lanka	89	5	Lower-middle-tier economics	Human capital development
Pakistan	Not in top 100	Not ranked	Lower-middle-tier economics	Digital payment growth
Bangladesh	Not in top 100	Not ranked	Lower-middle-tier economics	Mobile penetration (109.6%)

Technology Adoption Patterns: Analyzing the Digital Divide

Iran’s 64th place in the Global Innovation Index 2024 represents a sustained performance that reflects technology and knowledge outputs despite structural constraints. While Iran’s ranking shows improvement in some sub-indices, overall innovation progress has been constrained by sanctions, limited access to international markets, and barriers to technology transfer. Iran demonstrates strengths in knowledge-based sectors, produces a large number of engineering and STEM graduates, ranks 17th globally in annual science and engineering publications, and maintains an educated workforce capable of high-value technological and scientific work. Its

research clusters, particularly in Tehran, Isfahan, and centers affiliated with Sharif University, drive domestic innovation despite limited venture capital and commercialization activity. However, a digital divide persists in various regions, with urban centers leading in technology adoption while peripheral regions lag behind in connectivity, digital skills, and infrastructure. Addressing these gaps is crucial to transforming Iran's human capital and research output into broader economic and technological impact.

Analysis of specific sub indicators reveals the characteristics of Iran's innovation ecosystem:

ICT Services Exports: Iran has a growing knowledge based services sector, particularly in software development and IT services though export levels are constrained by international sanctions and limited access to global markets.

Venture Capital Activity: Venture capital activity is limited due to sanctions and restricted financial flows resulting in few high value startups and a small number of domestic "unicorn" companies compared with global leaders.

Knowledge-intensive workers: Iran produces a large number of graduates in STEM fields with more than 100,000 engineering graduates annually and a growing workforce in research, software, analytics and design sectors supporting domestic innovation and technological developments.

Patenting Activity: Iran filed over 15,000 patent applications reflecting strong domestic R&D efforts though global integration remains limited and per capita patenting low compared with top ranking innovation economies.

Iran ranks 64th in the world and 2nd in Central and South Asia in the Global Innovation Index 2024 and despite weak infrastructure and institutional support; it shows strong outputs in science and technology. Universities produce many science and engineering graduates but skills mismatches limit broad economic inclusion. According to Vahabzadeh (2021), Youth unemployment remains high (around 21%) reflecting a gap between education and labor market opportunities. Tehran is emerging as one of the world's top 105 science and technology hubs but venture capital and commercialization remain limited. International sanctions restrict foreign investment, technology transfer and research collaboration while also causing a significant brain drain 30,000 to 50,000 STEM graduates leave the country annually. Nevertheless Iran maintains domestic innovation, investing 0.68 percent of GDP in development and research and is developing its capabilities in pharmaceuticals, petrochemicals and agricultural technologies. Future prospects depend on strengthening infrastructure, expanding industry-research linkages, and improving institutional support to translate Iran's strong human capital into broad economic and technological gains, even amid the challenges of global integration.

Consolidated Iran Indicators for Generation Z

To address the dispersion of Iran-specific data across the manuscript, the following consolidated profile draws together the indicators that bear most directly on Generation Z. Demographically, Iran's Generation Z numbers 15.7–18.1 million (18–23 percent of the national population of 86 million); women constitute roughly 49 percent of this cohort and

outnumber men in higher-education enrolment, a structural feature with no parallel in the rest of the journal's region. On digital indicators, Iran leads the comparator set on internet penetration (85.0 percent), social-media usage (69.2 percent), mobile connections (142.4 percent), and smartphone ownership (62.5 percent), while running below the developed-economy average on generative-AI adoption among students (58.1 percent vs. 67.2 percent) and e-commerce usage (45.4 percent vs. 76.5 percent). On innovation outputs, Iran files in excess of 15,000 patent applications annually and ranks 17th globally in scientific publications; Tehran, Isfahan, and Sharif-affiliated research centres function as domestic clusters, but per-capita patenting and venture-capital activity remain orders of magnitude below frontier economies. On labour-market outcomes, youth unemployment stands at approximately 21–25 percent (Vahabzadeh, 2021), inflation has eroded real wages, and 30,000–50,000 STEM graduates emigrate annually — a flow that depletes precisely the cohort the GII rewards. On cultural and behavioural indicators specific to Generation Z, Doostmohammadi and Abbaszadeh Marzbali (2024) document protest participation across all 31 provinces during 2022–2023; Tabatabaei et al. (2024) record social-media-mediated emotional communication as the dominant channel within Iranian familial bonds; Latifian et al. (2024) report rising internet-addiction prevalence and associated mental-health strain among Tehran adolescents; and Ashayeri et al. (2024) trace identity-formation patterns to non-state Persian-language media exposure. Read together rather than separately, these indicators describe a cohort that is digitally saturated, educationally accomplished, culturally re-anchored to pre-Islamic Iranian identity, and economically and politically under-absorbed — a configuration that no individual indicator captures and that is the analytical reference point for the Analysis section that follows.

Technology adoption rates show complex patterns of progress and persistent inequality, as summarized in Table 2.

Table 2. Digital Technology Adoption in South Asia (2024)

Indicator	India	Pakistan	Bangladesh	Iran	Developed Nations Average
Internet Penetration	57.5%	33.1%	45.5%	85.0%	88.3%
Social Media Users (% population)	41.3%	29.4%	31.4%	69.2%	79.6%
Mobile Connections (% population)	84.4%	88.2%	109.5%	142.4%	132.8%
Smartphone Ownership	46.9%	31.6%	38.3%	62.5%	83.2%
Generative AI Adoption (students)	93.1%	34.1%	29.1%	58.1%	67.2%
E-commerce Usage	38.7%	18.1%	22.6%	45.4%	76.5%

Analysis

Zoomers in South Asia and Iran collectively over 400 million people demonstrates high digital fluency amid uneven access: India shows 93.5% adoption of generative AI among students while facing substantial connectivity gaps, and Bangladesh's 108.6% mobile penetration masks gender gap, Iranian Gen Z reshapes cultural and familial norms through social media. Despite concerns about cultural disengagement, evidence suggests that selective adaptation is being maintained rather than being driven out. While changing their practices to adapt to contemporary lifestyles, Generation Z remains 79-85% engaged in religious festivals,

88-91% in respect for elders, and 71-79% in extended family commitments. Literary engagement is shifting to digital platforms (WattsApp, Instagram poetry) rather than disappearing altogether. However, innovation gaps remain apparent. South Asian region invest 0.03-0.65% of their GDP in research and development, compared to 2.85% in developed countries - a difference of 4.4-fold to 94.5-fold. Patent production lags 93.6-fold to 1,871-fold, despite producing STEM graduates at competitive rates (28.6-42.4%). (Narimani (2024); Derakhsh et al., 2024; Tabatabaei et al., 2023)

Applying Cultural Transmission Theory: Iran as the Pivotal Case

Cavalli-Sforza and Feldman's (1981) tri-channel model of cultural transmission — vertical (parental), horizontal (peer), and oblique (non-parental adult) — provides the most explanatory framework for the Iranian case, and through it for the broader South Asian pattern. The Iranian data in this study show that the three channels are no longer in equilibrium for Generation Z. Vertical transmission, historically reinforced by state-mandated religious education, has weakened sharply: Doostmohammadi and Abbaszadeh Marzbali (2024) report that the children of revolutionary-era parents in Tehran, Mashhad, and Isfahan reject mandatory hijab observance at rates exceeding 70 percent, even when their parents personally adhere to it. Horizontal transmission, by contrast, has accelerated through digital infrastructure: with 85.0 percent internet penetration, 69.2 percent social-media usage, and 142.4 percent mobile-connection density (Table 2), Iranian Zoomers exchange cultural content peer-to-peer at volumes their parents never experienced, including through Telegram channels and VPN-mediated Instagram networks that route around state filtering. Oblique transmission has fragmented: where clerical authority and state media once dominated this channel, Iranian Generation Z now receives oblique cultural input from diaspora intellectuals, exiled satirists, and transnational Persian-language platforms (Manoto, Iran International, BBC Persian). Ashayeri et al. (2024) document this realignment empirically, showing that exposure to non-state Persian-language media correlates more strongly with identity formation among Iranian youth than parental religiosity does. The theory therefore predicts — and the evidence confirms — not cultural abandonment but a redistribution of transmission weight. The Iranian case is decisive evidence that when vertical and oblique channels are perceived as coercive, biased horizontal transmission expands to fill the gap, producing what Agha Mohammadi (2025) calls "selective re-traditionalization": hijab rejection coexisting with rising engagement with Hafez, Ferdowsi, and Nowruz observance. The same mechanism, with different content, explains why South Asian Zoomers retain festival participation (79–85 percent) while reinterpreting its doctrinal weight.

The state–religion configuration of each society is itself a determinant of how the three transmission channels operate, and any cultural-transmission analysis of this region requires that this variable be made explicit. Iran combines a Shi'a-majority population with a state that institutionalises religion through compulsory observance, religious education, and morality enforcement; vertical and oblique channels in Iran are therefore state-amplified in the direction of doctrinal continuity, which is precisely why their loss of credibility among Generation Z produces the sharp horizontal-channel response documented above. Pakistan

and Bangladesh combine Sunni Muslim majorities with constitutionally Islamic states (Pakistan) or formally secular states with substantial religious public role (Bangladesh); their vertical and oblique channels carry doctrinal content but with weaker coercive enforcement, producing slower channel redistribution and a smaller protest signature among Generation Z. India and Nepal combine Hindu-majority populations with constitutionally secular states; cultural transmission in these contexts operates through caste, regional, and family networks rather than state religious apparatus, which explains why Indian Generation Z negotiates religious practice (festival participation rising while doctrinal observance loosens) without the rupture seen in Iran. Sri Lanka and Bhutan present a Theravada Buddhist majority with state patronage of religion but without doctrinal enforcement on personal practice; vertical transmission of religious identity remains strong while behavioural adaptation proceeds with limited friction. The implication for the cultural-transmission framework is that the rate at which horizontal digital channels displace vertical and oblique channels is a direct function of how coercive the state–religion configuration is. Iran represents the high-coercion end of the regional spectrum and therefore the highest channel-redistribution rate; the South Asian states sit at intermediate and low-coercion points and therefore exhibit slower, less politically volatile redistribution. This is the precise mechanism by which the Iranian case generates inference about the regional trajectory rather than a parallel description.

Applying Diffusion of Innovations Theory: Iran's Bifurcated Adoption Curve

Rogers' (2003) five attributes — relative advantage, compatibility, complexity, trialability, and observability — map onto the Iranian case with a sharpness that exposes the deeper structure of the regional digital divide. On consumer-facing technologies, where all five attributes are favourable, Iran sits well into the early-majority phase: smartphone ownership at 62.5 percent, social-media adoption at 69.2 percent, and generative-AI use among students at 58.1 percent (Table 2) place Iran ahead of Pakistan and Bangladesh on every consumption indicator and ahead of India on smartphone penetration. Trialability is high (most digital tools are free or unsanctioned), relative advantage is acutely felt by a population whose formal economy underperforms, and observability is amplified by the same dense networks that drove the 2022 protests. By Rogers' classification, Iranian Generation Z behaves as early adopters of consumer digital innovation. On production-side innovation, however, the same population is stalled in the laggard zone of the curve. Iran files over 15,000 patent applications annually, yet per-capita patenting remains 93- to 1,870-fold below developed-economy benchmarks; venture-capital activity is constrained by sanctions to a fraction of comparable middle-income economies; and only a small share of the country's 100,000-plus annual STEM graduates enter formal R&D pipelines (Narimani, 2024). Diffusion theory explains this bifurcation: consumer adoption requires only individual willingness, but production-side adoption requires compatible institutional infrastructure — capital markets, intellectual-property enforcement, industry–research linkages, international collaboration channels — and on each of these compatibility dimensions the Iranian system imposes prohibitive barriers. The implication for South Asia is direct: Pakistan's 33.1 percent internet penetration and Bangladesh's exclusion from the GII top-100 are not symptoms of cultural

resistance to innovation but of the same compatibility failure visible in Iran. Where consumer trialability is high, South Asian Zoomers move quickly along the S-curve; where institutional compatibility is low, the curve flattens regardless of individual aptitude.

Applying the Demographic Dividend Framework: The Iranian Warning

Bloom and Williamson's (1998) demographic-dividend framework, extended by Mason and Lee (2006), holds that a youth bulge converts into accelerated growth only when four conditions are satisfied simultaneously: productive labour absorption, relevant human-capital formation, governance quality, and macroeconomic stability. Iran provides the most instructive test of this framework in the journal's region. Demographically, the conditions are met: 15.7–18.1 million Iranians belong to Generation Z, the working-age share is at its historical peak, and dependency ratios will not turn unfavourable for another fifteen to twenty years (Mason and Lee's 16–21-year window). Human capital is also present: literacy is near-universal, university enrolment exceeds regional averages, and Iran ranks 17th globally in scientific publication output. Yet on the remaining two conditions — labour absorption and macroeconomic stability — the Iranian system fails decisively. Youth unemployment stands at roughly 21–25 percent (Vahabzadeh, 2021), inflation has eroded real wages over a sustained period, and 30,000–50,000 STEM graduates emigrate annually. Applying the framework, Iran is currently realising the negative variant: a demographic burden in which an educated, digitally connected, politically aware Generation Z consumes public resources without the institutional channels to convert its human capital into productive output. The 2022 protests are, in dividend-theory terms, the predictable political consequence of a population that has accumulated capability faster than the system has accumulated absorption capacity. South Asia's implication is unambiguous: India, Pakistan, and Bangladesh sit at earlier points on the same trajectory, with similar youth-unemployment ranges (17–26 percent), similar emigration intent (~48 percent), and similar institutional bottlenecks. The Iranian case operationalises the framework by showing what happens when the demographic window is approached without the absorption conditions in place, and it dates the regional deadline: South Asia has, on Mason and Lee's timing, roughly the same fifteen-to-twenty-year horizon before its own dividend window narrows.

Synthesising Iran's Indicators: A Theory-Integrated Reading

Read together, the three theories converge on a single diagnosis of the Iranian case that the descriptive data alone cannot deliver. Iran's GII rank of 64 (second in Central and South Asia), its 0.68 percent of GDP allocated to R&D, its 17th-place global standing in scientific publications, and its annual loss of 30,000–50,000 STEM emigrants are not an unrelated set of indicators — they are the joint signature of three theoretical mechanisms operating simultaneously. Cultural-transmission theory locates the root of the 2022–2023 mobilisation in the redistribution of transmission weight away from coercive vertical and oblique channels toward digitally-enabled horizontal exchange; the Tabatabaei et al. (2024) finding that Iranian Generation Z communicates emotional and political content through social-media networks at densities exceeding face-to-face exchange is direct evidence of this redistribution. Diffusion

theory locates the simultaneity of high consumer-tech adoption (smartphone 62.5 percent, gen-AI 58.1 percent) and weak production-side innovation in differential compatibility: the consumer S-curve has crossed the chasm into the early-majority phase, while the production-innovation curve remains constrained at the early-adopter stage by sanctions, capital scarcity, and weak industry–university linkages. Demographic-dividend theory locates the political volatility — including Latifian et al.'s (2024) documented mental-health burden among Tehran adolescents and Khosravi's (2008) "waiting periods" — in the absorption gap between accumulated human capital and available economic and civic roles. The three theories are not alternative explanations but complementary lenses on a single Iranian condition: a generation that is culturally connected, digitally fluent, and demographically positioned, yet institutionally under-absorbed. Each indicator in Tables 3 and 4 receives, in this integrated reading, a theoretical anchor rather than a stand-alone descriptive role, and each provides a calibrated reference for evaluating the comparable but earlier-stage trajectories of India, Pakistan, Bangladesh, and Sri Lanka.

Table 3. Critical Indicators Snapshot

Metric	South Asia	Developed Nations	Gap
R&D Expenditure (% GDP)	0.03-0.64%	2.84%	4.4-94.6x
Researchers per million	79-253	4,387	17.3-55.5x
Patents per capita	0.0001-0.002	0.187	93.5-1,870x
Broadband cost (% income)	8-12%	1-2%	4-6x
Youth seeking emigration	~48%	<15%	3.2x

Table 4. Results of 10-year scenarios

Scenario	R&D Investment	Youth Unemployment	Innovation Rank (India)	Result
Optimistic	2.5% GDP	8-12%	25-40	Dividend realized
Status Quo	0.8-1.0% GDP	15-20%	~35	Modest gains
Pessimistic	<0.7% GDP	>25%	Decline	Demographic burden

Conclusion

The integrated reading developed in the Analysis — cultural transmission theory accounting for the redistribution of transmission channels, diffusion of innovations theory accounting for the bifurcation between consumer and production-side adoption, and the demographic-dividend framework accounting for the absorption gap — carries directly into the policy conclusions that follow. Iran, as the journal's primary geographic anchor, is not used here as one case among several but as the calibrated reference: it is the regional system in which all three theoretical mechanisms have advanced furthest, and it is therefore the system whose trajectory most directly signals what awaits South Asia if the absorption gap is not closed within the demographic window. The recommendations below are framed accordingly.

South Asia's zoomers stand at an unprecedented historical inflection point where the convergence of demographic scale, digital transformation and cultural evolution will not only irreversibly shape regional trajectories, but potentially redefine global development patterns for the 21st century. This 400 million-plus group of young people represents much more than statistical populations increase-they embody the living tension between the civilizational traditions of millennia and the ruthless forces of technological modernity, navigating this

paradox with a complexity that challenges simplistic narratives of cultural emancipation or innovation paralysis. The evidence convincingly suggests that South Asian zoomers practice what could be called "strategic cultural synthesis"-the conscious and subtle preservation of identity-building cultural elements (78-85% participation in religious festivals, 88-92% respect for elders, 83-88% proficiency in a regional language) while simultaneously embracing technological frontiers with remarkable agility (93% adoption of generative AI among Indian students, rapid mobilization capabilities of social media). This is not cultural schizophrenia, but an evolved adaptive strategy refined through the unique pressures of rapid modernization in deeply traditional societies. This analogy with Iran illuminates this dynamic with stark clarity: a generation in which many challenge mandatory hijab laws while reciting the poems of Hafez, that protests religious restrictions while celebrating Nowruz, shows that cultural preservation and modernization are not opposing forces, but potentially synergistic elements in the formation of generational identity.Yet the stark reality remains that structural barriers—not individual deficiencies or cultural constraints—are the main obstacle to realizing the demographic dividend. Measures of the innovation gap tell a clear story: South Asian countries invest 4.4 to 94.6 times less in research and development, employ 17.3 to 55.5 times fewer researchers per capita, and generate 93.5 to 1,870 times fewer patents than developed economies. These are not marginal differences that can be corrected by incremental policy adjustments; they indicate fundamental systemic failures that require transformative intervention. With 48 percent of young people willing to migrate and unemployment across the region exceeding 17 to 25 percent, we are not only witnessing poor economic performance but also an active loss of the human capital needed to accelerate development.

The Iranian cautionary tale resonates with particular urgency: the educated, and digitally connected, Generation Z, economically crippled by internal and external failures and structural constraints, is becoming not a development asset but a revolutionary pressure point. The 2022-2023 protests following the death of Mahsa Amini, the Bangladeshi youth uprisings of 2024, and the Nepalese demonstrations of 2025 are not isolated events but manifestations of a broader regional pattern—the potential of a desperate generation searching for ways out when constructive paths remain blocked. The coming decade presents policymakers with a dual choice of civilizational consequence. The optimistic path—a comprehensive educational transformation emphasizing critical thinking rather than rote memorization, developing infrastructure by achieving affordable global broadband and reliable electricity, nurturing an innovation ecosystem by mobilizing venture capital and simplifying regulations and increasing R&D investment to 2.6% of GDP could propel India to the 25th to 41th positions on the global innovation index, reduce youth unemployment to 8 to 12 percent, and establish South Asia as a 21st century innovation hub that rivals the developmental successes of East Asia. Conversely, the pessimistic path-continuing policy gradualism, persistent structural barriers, accelerating brain drain-risks turning the demographic dividend into a demographic catastrophe, with unemployment exceeding 26 percent, social instability intensifying, and a generation's development potential irreparably lost. The demographic dividend window remains open, but it is narrowing daily. South Asia's Generation Z has demonstrated

extraordinary readiness through educational achievement, entrepreneurial ambition, and cultural creativity. They do not need incentive systems, but rather systems of empowerment that guide them, not constrain their capabilities. The civilizational question facing South Asia's leadership, therefore, is existential: Will they comprehensively capitalize on the generational potential, or will history record this era as the moment when the world's largest youth group turned their most important missed opportunity into their own? The answer will resonate not for years but for generations, determining whether South Asia ascends as a global power or stagnates as a cautionary tale of unrealized potential.

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