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Navigating the shift to Education 5.0: Enhancing higher education in India

pwc

ASSOCHAM
· Ideate · Innovate · Impact ·

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Foreword – ASSOCHAM

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Chairman
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India's education sector is undergoing a massive transformation as seen by recent events such as the refined National Education Policy (NEP), increase in global industry connections with educational institutes and the use of new-age technologies. This marks a point in time where our shared histories will head towards the point where education becomes even more powerful, personalised and freely accessible than it used to be.

As we face a rapidly changing world, it is important that we re-conceptualise education as a dynamic ecosystem that can adapt to the needs and goals of learners instead of seeing it merely as a static institution. The path towards Education 5.0 envisages the merging of advanced technologies with human-centric learning to revolutionise the current education system. This will help students be prepared and aligned for future needs.

Based on inputs from market trends and research, this report gives an in-depth understanding of what constitutes Education 5.0 in terms of principles and practices. It emphasises the role played by agility, adaptability and inclusivity in preparing learners capable of thriving in a globally interconnected economy.

By embracing various initiatives towards Education 5.0, we can achieve personalised learning and inclusivity. Moreover, we can enable individual people and organisations to navigate through this dynamic landscape successfully.

Foreword - ASSOCHAM

Perminder Jeet Kaur
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In recent times, there have been several advancements happening in the education sector, catalysed by the pandemic and the growth of edTech. NEP 2020 has put forth additional emphasis on the need for digital education, and industries are increasingly demanding educational institutes to focus on the skill gaps.

The growing demand for more personalised, flexible and outcome-oriented education calls for India's progression towards Education 5.0. ASSOCHAM has been collaborating with various stakeholders in the education sector, amplifying the voice of industries, educational institutions and students in deliberating productive measures which will have a substantial impact on learning.

We believe that Education 5.0 can enrich learning experience and outcomes. It is unique of blend of modern-day technologies along with human-centric approaches which will enable the creation of cohesive, personalised and flexible learning.

This report by PwC and ASSOCHAM comprises an extensive study on Education 5.0, its implications and growth roadmap needed for India's education ecosystem.

As we embrace the change towards Education 5.0, we can empower individuals and enrich organisational needs, resulting in an overall successful education ecosystem.

Foreword – PwC

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Partner
PwC India

In an era where technology advancements are seen constantly and industries are adopting new technologies every day, Education 5.0 is a very crucial and timely evolution. As we take this next step in the evolution of education, where artificial intelligence, machine learning, and digital platforms are reforming every aspect of our lives, Education 5.0 presents a remarkable approach to preparing the future workforce for all the challenges and opportunities ahead.

Education 5.0 is the culmination of advanced technologies, personalised learning, and the development of human centric learning, emphasising individual empowerment, innovation, flexibility and inclusivity.

In this report, we study the initiatives related to Education 5.0 undertaken by other countries to understand the benefits reaped by them. The report analyses the recent initiatives taken by industry, government and universities. Furthermore, it drafts a roadmap for India to venture down the pathway for Education 5.0.

The journey towards Education 5.0 brings about its own set of challenges like financial fulfilment, adjusting to changes, and so on. Specifically, adapting to new learning methodologies will require a cultural shift, which will be the most difficult to manage. To navigate these challenges, this report also highlights several strategies that can be useful in ensuring that the journey to Education 5.0 doesn't halt.

The insights and strategies provided in this report will be helpful in ensuring that we fulfil our responsibility to provide the new generation with all the skills and knowledge they need.

Foreword – PwC

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PwC India

As we usher in the new age of education, its impact on the economic growth of India becomes even more apparent. This transformation of education is very integral and focuses on development of innovative curriculum, flexible learning practices and extensive industry collaborations. Moreover, it will help India in facilitating more personalised learning, improve inclusivity and enable industry-oriented learning.

In this report, we comprehensively discuss the impact of Governmental policies, industry collaboration and technological usage towards Education 5.0. It suggests calls to action and recommendations for the key stakeholders such as educators, educational institutions, industry partners, parents and the Governmental entities.

As educational institutions explore new-age technologies to provide flexibility and better learning experiences, Governments are defining new policies to promote more customised and personalised learning, and the industry is actively being a part of educational boards in order to help overcome skill gaps.

The transformation journey will pose many difficulties in achieving the desired state of education in the country, ranging from monetary aspects, widespread technology adoption and change management issues. In this report, we highlight measures to overcome these challenges.

Let us embark on this journey together, with an unwavering commitment to empower the learners of today and tomorrow.

1 Introduction to Education 5.0

1.1. Definition of Education 5.0

According to the UNESCO Forum for Education, 'Education 5.0 is the use of new technologies to provide more humanised teaching, with a focus on students' social and emotional development and solutions that improve life in society'.[1]

Figure 1: Characteristics and pillars for Education 5.0

Education 5.0

Accessibility and equity
Comprehensive and relevant curriculum
Industry–university collaboration
Government initiatives and policies
Collaboration and connectedness
Innovative delivery and evaluation
Technology and infrastructure
Human-centric learning

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1   https://unevoc.unesco.org/home/tvetipedia+glossary/lang=en/show=term/term=Education+5.0#:~:text=Education%205.0%20is%20the%20use,that%20improve%20life%20in%20society

1.2. Need for transition to Education 5.0

The shift to Education 5.0 is driven by a strong need to match education standards in India to those of a fast-changing global economy. Ray Dalio's views on education can help us to understand this shift and its impact on economic productivity and stability.

Ray Dalio says that concentrating on the value of education is essential to achieving national success. According to him, a well-educated workforce boosts productivity, fosters innovation and ensures long-term growth.[2] Furthermore, the growth of education directly influences the economic prosperity of the country. Education 5.0 will play a key role in:

Boosting economic productivity: Education 5.0 uses new-age advanced technologies to enhance productivity by fostering skill development and innovation.

Anticipating technological disruption: Education 5.0 equips students to effectively navigate and keep pace with changing technological trends.

Promoting global competitiveness: Investments in Education 5.0 prepare a workforce capable of competing globally.

2   https://www.cnbctv18.com/storyboard18/storyboard18-bookstrapping-why-nations-succeed-and-fail-by-ray-dalio-12893482.htm

1.3. Overview of Education 5.0 across the globe

Countries around the world are pioneering various initiatives that highlight the shift towards Education 5.0, each addressing unique educational challenges and leveraging distinct opportunities to enhance learning experiences.

1 Personalised learning

Singapore has implemented personalised learning through its 'Teach less, learn more' initiative. This approach emphasises student-centred learning, allowing students to progress at their own pace and explore topics aligned with their interests and abilities.[3]

2 Technology integration

Finland has integrated AI technology into its education system primarily to improve teaching quality. Finnish schools use digital tools and resources to support collaborative learning, digital literacy and creativity.[4]

3 Skill development

South Korea's 'Smart education' initiative emphasises the development of twenty-first century skills through digital learning environments, project-based learning and coding education. Students engage in hands-on activities and collaborative projects to enhance their problem-solving and communication abilities.[5]

4 Global citizenship education

Canada's education system incorporates global citizenship education through initiatives like the 'Global Competence Certificate' programme. Students explore global issues, participate in cross-cultural exchanges and engage in service-learning projects to develop a sense of global responsibility.[6]

5 Lifelong learning

New Zealand's 'Education futures' strategy encourages lifelong learning by providing flexible learning pathways and opportunities for upskilling and reskilling. Adult education programmes, online courses and vocational training options are available to support lifelong learners.[7]

6 Data-driven decision making

US facilitates data-driven decision-making in education through initiatives like the 'Data quality campaign'. Schools and districts collect and analyse data on student performance, attendance and behaviour to identify trends, set goals and improve educational outcomes.[8]

7 Zimbabwe Education 5.0 model

Africa has pioneered the 'Zimbabwe Education 5.0' initiative by focusing on five key pillars – teaching, research, community service, innovation and industrialisation – to bridge the gap between academic institutions and needs of the society, thus ensuring that education contributes directly to the economic and social development of the continent.[9]

3   https://www.nlb.gov.sg/main/article-detail?cmsuuid=bf38bb79-2b26-4068-828c-c89246c65c10

4   https://timesofindia.indiatimes.com/education/online-schooling/know-these-6-winners-for-best-digital-practices-award-by-unesco-from-2019-21/articleshow/94913713.cms

5   https://unesdoc.unesco.org/ark:/48223/pf0000366729

6   https://www.cmec.ca/682/Global_Competencies.html

7   https://www.enz.govt.nz/about-enz/international-education-strategy

8   https://dataqualitycampaign.org/about/

9   https://www.herald.co.zw/education-5-0-to-catapult-zim-to-greater-heights/

Key milestones

Global events: The COVID-19 pandemic accelerated the adoption of online learning and highlighted the need for a robust digital infrastructure.

Technological innovations: Artificial intelligence (AI) and machine learning (ML) for personalised learning, virtual and augmented reality (VR/AR) for immersive experiences, and internet of things (IoT) for connected classrooms became more prevalent.
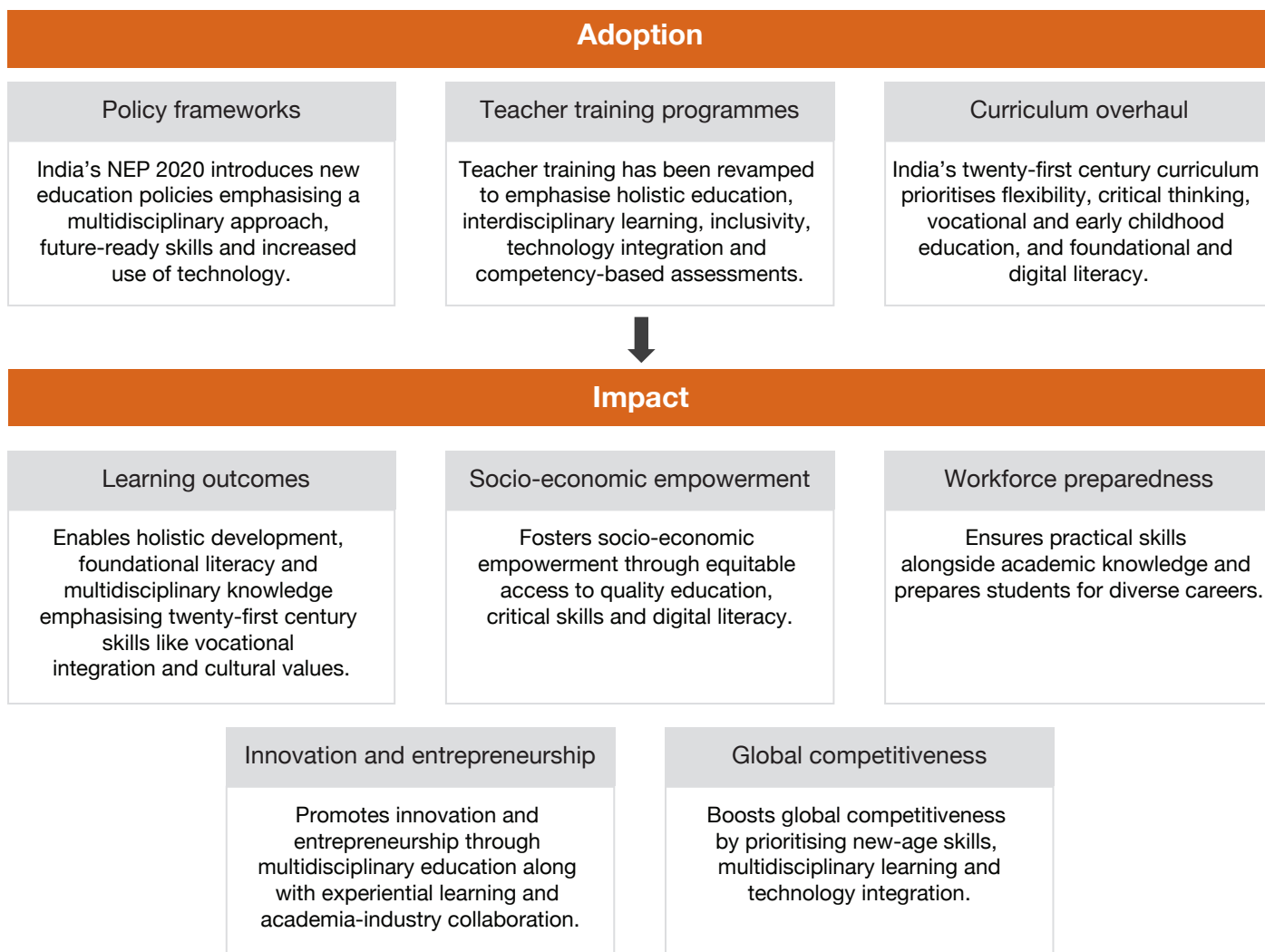
Change in student mindset: Expectation for a flexible learning environment and mobility solutions transformed the mode the education delivery.

As we continue to explore and assess these innovative practices, the collective goal of institutions remains clear: To create an inclusive, dynamic and forward-thinking educational landscape that empowers learners everywhere.

1.4. Current educational landscape in India: A brief analysis

As India advances from Education 3.0 to Education 4.0, elements of Education 5.0 are also emerging in a gradual manner. This transition to Education 5.0 is aimed at prioritising holistic student development, enabling personalised learning and facilitating industry readiness. In line with this, several key trends have emerged in the education sector:

- The education sector in the country has seen rapid growth, reflecting India's commitment to improving educational quality and accessibility.

- Quality and growth of education is progressing swiftly in urban areas due to better infrastructure and resources; however, rural regions still lag behind.

- Higher education institutions in India are increasingly partnering with international universities to elevate educational standards.

Adoption		
Policy frameworks	**Teacher training programmes**	**Curriculum overhaul**
India's NEP 2020 introduces new education policies emphasising a multidisciplinary approach, future-ready skills and increased use of technology.	Teacher training has been revamped to emphasise holistic education, interdisciplinary learning, inclusivity, technology integration and competency-based assessments.	India's twenty-first century curriculum prioritises flexibility, critical thinking, vocational and early childhood education, and foundational and digital literacy.

| Impact		
Learning outcomes	**Socio-economic empowerment**	**Workforce preparedness**
Enables holistic development, foundational literacy and multidisciplinary knowledge emphasising twenty-first century skills like vocational integration and cultural values.	Fosters socio-economic empowerment through equitable access to quality education, critical skills and digital literacy.	Ensures practical skills alongside academic knowledge and prepares students for diverse careers.
Innovation and entrepreneurship	**Global competitiveness**	
Promotes innovation and entrepreneurship through multidisciplinary education along with experiential learning and academia-industry collaboration.	Boosts global competitiveness by prioritising new-age skills, multidisciplinary learning and technology integration.	

Source: Policy frameworks

2

Journey to Education 5.0

The journey from Education 1.0 to Education 4.0 has been transformational for the education sector and represents a paradigm shift in teaching and learning methodologies driven by technological advancements and evolving societal needs.

Education 1.0
Traditional approach

- Traditional classroom instruction
- Rote learning, one-way communication
- Textbooks, chalkboards, standardised tests

Education 2.0
Digital integration

- Introduction of technology; blended online and traditional learning
- Interactive, multimedia learning
- Students as active participants

Education 3.0
Personalised learning

- Technology integrated in teaching
- Flipped classrooms; collaborative, digital tools and platforms
- Critical thinking, active engagement and diverse pathways

Education 4.0
Future-oriented

- Industry relevance, skill-based learning
- Deep integration of emerging technologies like AI, VR and AR
- Flexible, decentralised learning with interdisciplinary, real-world exposure

Figure 2 highlights the progression state of educational advancements and technology adoption across different continents. The map was created based on PwC's analysis of the development characters exhibited by each country to arrive at their educational state (from 1.0 to 5.0).

Figure 2. Current state of education prominence in select countries

- Between Education 2.0 and 3.0
- Between Education 3.0 and 4.0
- Education 4.0
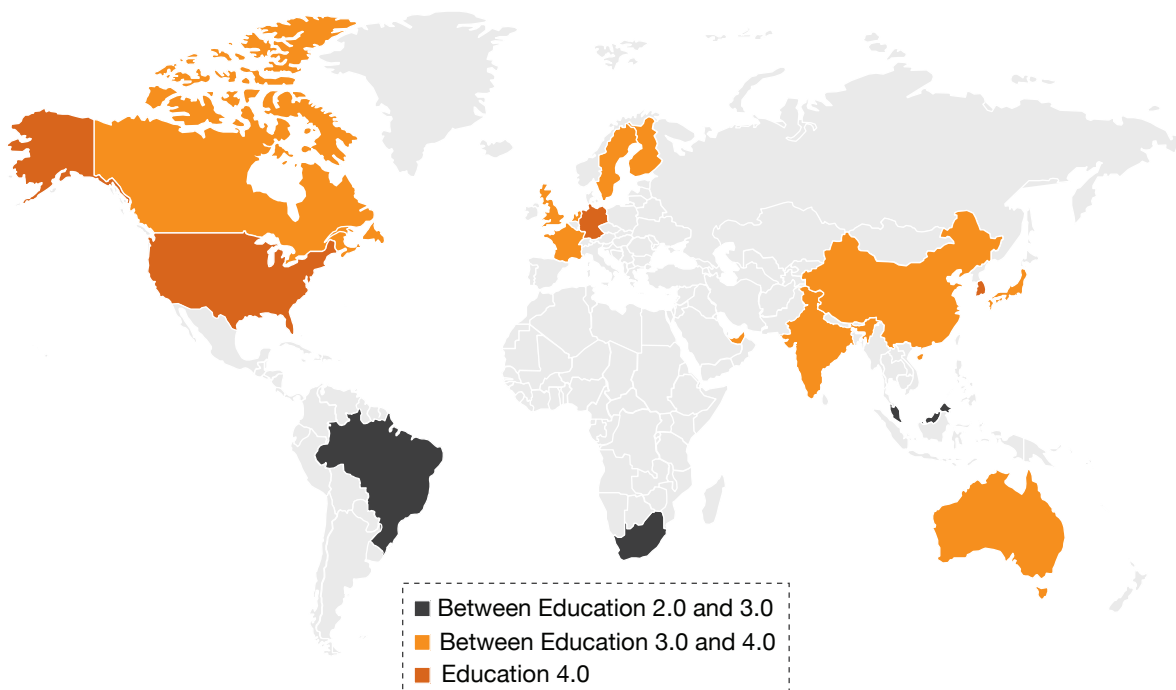
The following observations were noted during the analysis:

Factors influencing growth	Strong governmental initiatives	Increased internet penetration	High adoption of digital technology
Factors inhibiting growth	Significant disparities between rural and urban areas	Lower education expenditure by the government	Digital literacy and skill gaps

2.1. Characteristics of Education 5.0 driving higher education in India

Here, we will comprehensively discuss the characteristics that play a key role in promoting Education 5.0 and highlight the way forward for the same.

Comprehensive and relevant curriculum	• Integrate essential skills for the twenty-first century into learning objectives. • Integrate interdisciplinary approaches with measurable learning outcomes (LOs). • Ensure alignment with national and international educational standards.
Innovative delivery and evaluation	• Explore blended learning methods like hybrid courses and virtual labs. • Explore project-based, inquiry-based and experiential learning. • Consider self-paced, skill and competency-based, and microlearning approaches.
Human-centric learning	• Prioritise diverse needs and backgrounds of stakeholders. • Create personalised pathways for faculty and students using adaptive tools. • Foster collaboration through peer networks and learning communities.
Collaboration and connectedness	• Foster public-private partnerships and joint research projects between institutes, businesses and the Government. • Engage academic and industry experts in policy formulation. • Emphasise multidisciplinary perspectives to drive excellence.
Accessibility and equity	• Address barriers and provide equal opportunities for all learners. • Promote Universal Design for Learning principles to accommodate diverse needs. • Design physical and digital learning environments for learners of all abilities.

2.2. Pillars of Education 5.0

In this section, we delve into the pivotal role of the three pillars of Education 5.0 and examine their significance and impact on reshaping education in the country. These pillars are: Industry–university collaboration, government initiatives and policies, and technology and infrastructure.

Industry–university collaboration
- Practical skill development
- Facilitating technology transfer
- Research expertise
- Innovation

Government initiatives and policies
- Policies for accessibility and equity funding
- Promoting innovation
- Supporting marginalised communities
- Enhancing infrastructure

Technology and infrastructure
- Innovative teaching methods
- Personalised learning experiences
- Physical facilities
- Digital infrastructure
- Connectivity

2.3. Expected impact of implementing Education 5.0

Education 5.0 is aimed at building a future where learning is dynamic, continuous and tailored to individual needs, thus preparing students to thrive in an ever-changing global landscape. The pillars highlighted above will therefore contribute to same by focusing on the Education 5.0 characteristics defined previously.

Workforce development

- Introduce incentives to boost university-industry collaboration.
- Align academia with industry needs to equip graduates with relevant skills.
- Integrate industry-based learning for real-world exposure and skill development.

Inclusive educational access

- Create initiatives to address educational disparities.
- Develop educational infrastructure in underserved regions.
- Use technology for distance education to ensure fair access in areas with limited infrastructure.

Curriculum enhancement

- Implement regulatory frameworks for ongoing industry feedback on education.
- Set up advisory boards with industry experts for curriculum insights.
- Use data analytics to track employment trends and adjust curricula accordingly.

Global research and innovation

- Facilitate global research collaborations.
- Establish collaborative research with international universities.
- Use virtual tools and cloud computing for efficient international research cooperation.
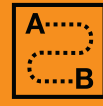
Flexible learning pathways

- Create frameworks to integrate industry certifications.
- Design flexible programmes for credentials recognised by both academia and industry.
- Use digital credentialing systems for easy verification of skills from online courses and industry training.

3

Analysis: The intersection of characteristics and pillars

3.1. Impact matrix

Education 5.0's impact matrix pinpoints where each pillar best supports its characteristics. This allows stakeholders to prioritise actions and investments to strengthen weaker areas. For instance, the matrix might reveal a need for the Government to better address accessibility and equity via technology and policies. This knowledge fosters collaboration between pillars to create a more effective and adaptable educational ecosystem.

Approach:

We individually evaluate all characteristics across key pillars, based on the following criteria:

- **Relevance:** Evaluates the essential importance of the pillar to the characteristic
- **Alignment:** Measures how well the pillar's goals match the characteristic's objectives
- **Potential:** Assesses the current effect of the pillar on the characteristic

Using a rating scale of 1 to 5, the average score for each criterion is then computed to determine the final score. Thereafter, the matrix is created.

For instance, in assessing industry–university collaboration against human-centric learning experiences, relevance and alignment both stand at 5 points, while impact scores 4, resulting in a total correlation score of 4.67.

Characteristics/pillars	Government initiatives and policies	Industry–university collaboration	Technology and infrastructure
Comprehensive and relevant curriculum	**Very high** (standards, frameworks)	**High** (aligns with industry needs)	**Moderate** (access to resources, tools)
Innovative delivery and evaluation	**High** (new pedagogies, assessment frameworks)	**Low** (limited unless focused on pedagogy)	**Very high** (online platforms, virtual simulations)
Human-centric learning experiences	**Low** (impact is less)	**Moderate** (real-world experiences, projects)	**Very high** (personalised, interactive tools)
Collaboration and connectedness	**High** (facilitates partnerships)	**Very high** (strong connection, collaborative)	**Very high** (global connectivity, digital platforms)
Accessibility and equity	**Very high** (reduces disparities, inclusive)	**Low** (varies, low impact)	**High** (bridges digital divide, equitable)

Government initiatives and policies:
The backbone of educational reform

- **Curriculum coherence and equity champions:** Government policies place significant importance in setting high standards for curriculum coherence and driving initiatives that ensure educational accessibility and equity for all students.

- **Innovative yet traditional:** While the policies and initiatives are pivotal in promoting innovative teaching and evaluation methods, their influence on fostering personalised learning experiences is less pronounced.

Industry–university collaboration:
Bridging academia and the real world

- **Collaboration and curriculum-aligned powerhouses:** These partnerships excel in creating strong connections and collaborative learning environments. They ensure that the curricula align closely with industry needs, providing students with the relevant skills and knowledge.

Technology and infrastructure:
Catalysts for modern education

- **Innovation leaders:** Technology is the driving force behind cutting-edge delivery methods and personalised, interactive learning experiences, making education more engaging and effective for students.

- **Global connectors:** Digital infrastructure and platforms enable seamless communication and collaboration across borders to foster global connectivity, thus promoting innovative methods to enable access to education across the world.

3.2. Insights from the impact matrix analysis

- **Policies set the stage, technology transforms and the industry connects:** Together, the three pillars work in synergy to advance education – Government policies make up the foundation, technology facilitates the innovative methods to promote learning, and industry partnerships ensure that the curriculum is aligned so as to help tackle real-world challenges.

- **Balancing act for future success:** To establish a strong education system, there is a need to maintain a proper balance between implementing strong policies, adapting to new-age technologies and establishing robust industry partnerships.

- **Room for growth:** Although the pillars are robust with respect to their specific areas, there is always room for growth. One such area includes enhancing inclusivity by leveraging industry partnerships and promoting personalised learning pathways using Governmental policies.

4

Implementation of Education 5.0

4.1. Global scenario

Case study 1: Finland[10,11]	
Initiatives	**Methods**
• Phenomenon-based learning (PhBL) has been introduced for interdisciplinary project learning. • Digital tools and platforms have been introduced in classrooms. • Teacher training programmes have been implemented, focusing on new pedagogies and use of technology.	• PhBL: Students select topics, conduct research and collaborate on projects. • Digital tools: Learning management systems platforms are used to facilitate blended learning environments. • Teacher training: Professional development is enabled through workshops and online courses.
Benefits	**Challenges**
• Student engagement and motivation has improved considerably. • Critical thinking and problem-solving skills have increased. • Greater flexibility and personalisation in learning is achieved.	• Resistance from traditional educators and institutions • Significant initial costs of installing technology infrastructure • Limited availability of digital resources for all students
Case study 2: Singapore[12,13]	
Initiatives	**Methods**
• Under the Smart Nation initiative, Singapore is planning to integrate technology and education. • SkillsFuture programme has been implemented for facilitating lifetime learning. • Educational experiences are customised through AI and data analytics.	• Smart classrooms: Advanced resources are used to improve interactive educational opportunities. • SkillsFuture programme: Credits and opportunities are offered to pursue lifelong education. • AI literacy: AI literacy is promoted among students and teachers to utilise AI and improve the existing education system.
Benefits	**Challenges**
• Tailored learning pathways are established, catering to individual styles. • These initiatives help build a future-ready digital economy. • Increased enrolment has been observed in lifelong learning programmes.	• Technology integration for conventional teaching methods • High costs associated with technological renovations • Digital disparity among students from different socio-economic backgrounds

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10 https://www.hindustantimes.com/education/india-can-learn-from-finland-s-phenomenon-based-learning-system/story-PMu4sT7KrUyYE6c7yl3RZO.html

11 https://www.educationfinland.fi/sites/default/files/2019-11/finfo_education_in_finland_en.pdf

12 https://www.smartnation.gov.sg/

13 https://www.the74million.org/article/shockwaves-innovations-how-nations-worldwide-are-dealing-with-ai-in-education/

Case study 3: South Korea[14,15]	
Initiatives	**Methods**
• The digital textbook project has been introduced to replace physical textbooks. • AI-driven learning platforms have been incorporated. • Government funding has increased to strengthen and promote computer science education in the curriculum for K-12 schools.	• Digital textbooks: Providing interactive, multimedia content that can be accessed on tablets and computers • AI platforms: Adaptive learning systems that personalise education based on student data • Coding education: Integration of coding practices and analytics into the regular curriculum
Benefits	**Challenges**
• Learning experiences have been enhanced and made interactive. • Student performance was improved by using redefined and personalised learning pathways. • Proficiency in digital literacy and coding skills has been enhanced.	• Huge investment required for infrastructure and training • Issues in protection of private student data • Challenges in transitioning to digital resources

4.2. Success stories from India

IIT Delhi	
Initiatives	Benefits
1. International Humanoid Robotics Foundation (IHRF) 2. STEM mentorship programme for schoolgirls	• Enhanced focus on collaborative healthcare robots, integrating robotics, AI, HCI. • Students acquire practical skills in areas like robotics, prototyping and designing. • STEM implementation fosters curiosity, skill-building and gender diversity in STEM fields.

VIT Vellore	
Initiatives	Benefits
1. Implementation of fully flexible credit system (FFCS)	• Offers customised courses with flexible subject, faculty and class timing choices. • FFCS empowers students to tailor their academic journey based on individual preferences. • Accommodates slow learners by providing essential and common courses throughout all semesters.

MAHE	
Initiatives	Benefits
1. Simulation-based learning	• Utilises high-fidelity medical simulators for realistic clinical scenarios • Students can engage in realistic scenarios without ethical risks or overtaxing situations. • Simulation-based learning allows learners to practice in real-life scenarios.

Source: IHFC; STEM; FFCS; simulation-based learning

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14 https://english.moe.go.kr/boardCnts/viewRenewal.do?m=0202&s=english&page=2&boardID=254&boardSeq=95291&lev=0&opType=N

15 https://www.mk.co.kr/en/special-edition/11026781

4.3. Key takeaways

The lessons that resulted in international Education 5.0 implementations have been discussed in this section, to show how these insights can inform and improve educational practices.

1. Focus on applied and project-based learning

- **Context:** The Finnish phenomenon-based learning and the US STEM frameworks as well as VIT Vellore's project-based learning demonstrate the effectiveness of applied methodologies for learning.

- **Takeaway:** There is a shift from traditional learning to experiential learning to prepare students for real-world challenges by imparting practical as well as theoretical knowledge.

2. Strengthen industry–academia collaborations

- **Context:** As proven by the benefits from the partnership between US industries and Singapore's SkillsFuture programme to establish a future-ready workforce, similar initiatives are now emerging in India – for instance, IIT Delhi's collaboration with a global cybersecurity company, and MAHE's partnership with a major IT services company for specific programmes.

- **Takeaway:** Establish strong partnerships between industries and universities to enhance the curriculum by aligning learning outcomes with industry needs in order to form a future-ready workforce.

3. Promote lifelong learning and continuous skill development

- **Context:** Singapore's SkillsFuture encourages individuals to learn for life by pursuing skills to master which will help them in their careers. On the other hand, Indian institutions are also planning to offer similar opportunities that have significant potential.

- **Takeaway:** With the advancements in technology and dynamic job market, new skills are required, and individuals need to keep up in this fast-evolving environment. Therefore, there is a need for initiatives that will support lifelong learning and continuous skill development to make the workforce future ready.

4. Ensure equitable access to education and bridge the digital divide

- **Context:** Singapore and Finland have taken initiatives to bridge the gap in education and increase inclusivity for all. IIT Delhi's STEM programme for schoolgirls also aims to achieve the same in India.

- **Takeaway:** Strategies need to be formulated for equal access to education in both urban and rural areas which would benefit all socio-economic groups and reduce the digital disparity between them.

5. Integrate advanced technologies in education

- **Context:** Digital books, AI learning tools and other advancements have been implemented by South Korea and Singapore. VIT and MAHE have started integrating major digital learning tools and massive open online courses (MOOCs) to enhance student learning.

- **Takeaway:** Investments and integrations need to be done for incorporating AI, VR and AR technologies and digital platforms to make education more personalised, accessible and interactive.

5

Assessment of ongoing initiatives in India

5.1. Assessing policy changes

The rapid shift to Education 5.0 requires comprehensive policy analysis, with governments worldwide shaping education through regulations, funding and strategic plans to foster innovation and inclusivity.

- **National Digital University (NDU):** India plans to establish the NDU to offer digital education in diverse Indian languages and information and communication technology (ICT) formats by collaborating with top public universities.[16]

- **Rashtriya Uchchatar Shiksha Abhiyan (RUSA 3.0):** RUSA 3.0 is aimed at enhancing education in underserved areas in line with the NEP. Furthermore, it plans to provide support in ICT integration, vocational skills and establishing model degree colleges.[17]

- **Scheme for Promotion of Academic and Research Collaboration (SPARC):** This scheme is meant for improving the research ecosystem and facilitating meaningful collaborations between top Indian and foreign institutions using a variety of methods.[18]

Intended benefits	• Enhanced accessibility and inclusivity • Improved quality and relevance of education
Possible challenges	• Complex implementation • Resistance to change • Funding and resource allocation

5.2. Industry insights and collaboration

Industry partnerships help students in attaining skills that are relevant according to the market needs and makes them ready for real world challenges. Higher education in India has seen significant increase in research fundings, as seen under the Impactful Policy Research in Social Science (IMPRESS) and Scheme for Trans-disciplinary Research for India's Developing Economy (STRIDE) schemes, with over INR 1,000 crore being allocated overall.[19]

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16   https://www.education.gov.in/sites/upload_files/mhrd/files/LU5163.pdf

17   https://pib.gov.in/PressReleasePage.aspx?PRID=1799301

18   https://sparc.iitkgp.ac.in/scheme_details.php

19   https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1598503

- **Government of Odisha and NASSCOM partnership:** The objective of this partnership is to focus on providing technical expertise, digital competence and industrial knowledge to 8,00,000 students and faculty through new-age technologies.[20]

- **Mission10X 2.0 (2024):** This initiative aims to enhance the existing curriculum for engineering students by aligning it with industry expectations to increase their employability.[21]

- **Collaborative initiative to launch technology/practical labs in schools:** A major social media and technology company is working with Government bodies like NITI Aayog under the Atal Innovation Mission to prepare school students with new-age technologies through technology/practical labs equipped with state-of-the-art infrastructure.[22]

Intended benefits	• Innovate educational delivery for students. • Ensure skill development to prepare a future-ready workforce.
Possible challenges	• Designing and updating the curriculum effectively • Industry alignment and regulatory considerations

5.3. Technology as a means of advancement

Technology is the bedrock of Education 5.0 as it drives transformation through digital tools, online platforms and innovative teaching methodologies.

- **Outcome-based education (OBE) and AI-led cognitive learning:** The focus is mainly on students' knowledge and skills, with AI dynamically assessing the progress of the same. AI also plays a role in adapting to the curriculum while evaluating attention, engagement and mental workload while learning digitally.[23,24]

- **Virtual learning ecosystem:** The Global Virtual Learning Consortium (GVLC) unites top universities, technology companies and governments across the world to create a virtual learning ecosystem using AI, VR, AR and blockchain for accessible, high-quality education.[25]

Intended benefits	• Enhanced engagement • Highly personalised learning
Possible challenges	• Implementation cost

20 https://www.financialexpress.com/jobs-career/education-odisha-govt-collaborates-with-infosys-nasscom-aims-to-boost-employability-of-students-3099567/

21 https://www.dnaindia.com/mumbai/report-iit-b-wipro-ink-mou-to-boost-engg-faculty-skills-1184971

22 https://pib.gov.in/PressReleasePage.aspx?PRID=2011896

23 https://www3.weforum.org/docs/WEF_Shaping_the_Future_of_Learning_2024.pdf

24 https://www.thedailystar.net/supplements/preparing-the-future/news/we-champion-holistic-development-through-outcome-based-education-3621621

25 https://www.education.gov.au/higher-education/national-higher-education-initiatives#toc--microcredentials-platform-for-lifelong-learners-
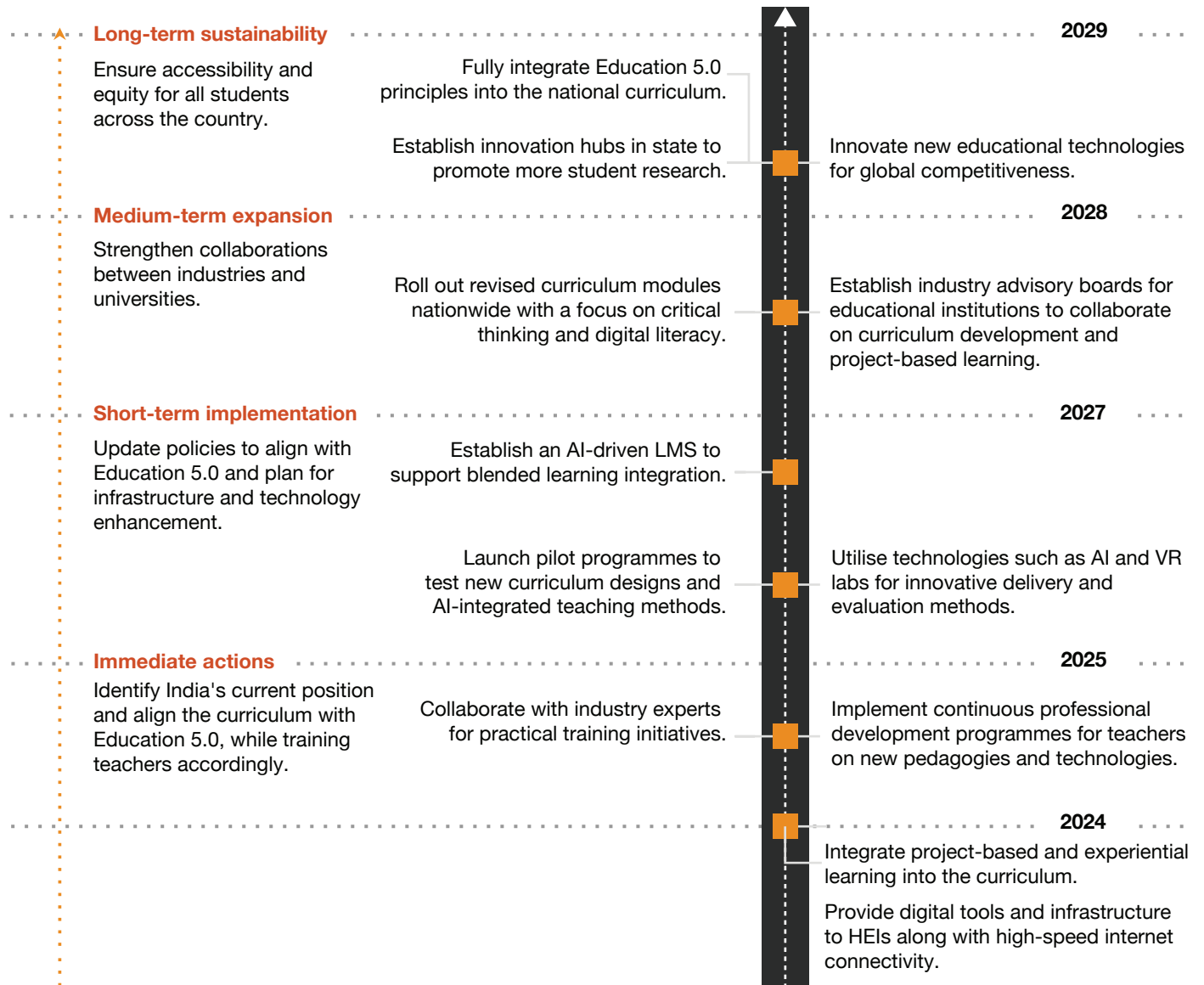
6

Unlocking strategies

6.1. Roadmap to achieve Education 5.0

Figure 3. Growth roadmap towards Education 5.0 – India

Indicative roadmap

Long-term sustainability

Ensure accessibility and equity for all students across the country.

Fully integrate Education 5.0 principles into the national curriculum.

Establish innovation hubs in state to promote more student research.

Innovate new educational technologies for global competitiveness.

2029

Medium-term expansion

Strengthen collaborations between industries and universities.

Roll out revised curriculum modules nationwide with a focus on critical thinking and digital literacy.

Establish industry advisory boards for educational institutions to collaborate on curriculum development and project-based learning.

2028

Short-term implementation

Update policies to align with Education 5.0 and plan for infrastructure and technology enhancement.

Establish an AI-driven LMS to support blended learning integration.

Launch pilot programmes to test new curriculum designs and AI-integrated teaching methods.

Utilise technologies such as AI and VR labs for innovative delivery and evaluation methods.

2027

Immediate actions

Identify India's current position and align the curriculum with Education 5.0, while training teachers accordingly.

Collaborate with industry experts for practical training initiatives.

Implement continuous professional development programmes for teachers on new pedagogies and technologies.

2025

Integrate project-based and experiential learning into the curriculum.

Provide digital tools and infrastructure to HEIs along with high-speed internet connectivity.

2024

Considering the initiatives and measures taken so far and the ones planned for the near future, India's journey to Education 5.0 should involve immediate changes to the curriculum and upgradation of digital infrastructure. This should be followed by a considerable shift towards innovative learning methods and assessment reforms in the short term, advancing digital access and professional training in the medium term, and enabling country-wide integration and sustainable innovation in the long run. Figure 3 outlines the roadmap to guide India towards the Education 5.0 progression journey.

6.2. Overcoming barriers to implementation and adoption

Skill gaps among educators

- Continuous professional development activities like National Initiative for School Heads' and Teachers' Holistic Advancement (NISHTHA),[26] Digital Infrastructure for Knowledge Sharing (DIKSHA)[27] should be conducted.

- Conduct mentor programmes like the National Mission for Mentoring (NMM)[28] where peers can learn from experienced educators.

Resistance to change

- Arrange change management programmes to ease the transition.

- Conduct campaigns and training sessions for educators to highlight the benefits of Education 5.0.

Resource constraints

- Seek out funding options such as Government grants, private partnerships and international institutions.

- Come up with innovative ways to raise funds, like education bonds, impact investing and crowdfunding.

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26 https://itpd.ncert.gov.in//

27 https://www.india.gov.in/spotlight/diksha-national-digital-infrastructure-teachers

28 https://www.thehindu.com/education/ncte-awaits-education-ministry-nod-to-roll-out-national-mission-for-mentoring-across-the-country/article67796767.ece#:~:text=The%20National%20Mission%20for%20Mentoring,personal%20support%20to%20to%20school%20teachers

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Way forward

7.1. Highlights and action points

The shift towards Education 5.0 means a major transformation for India to be even more flexible, adaptable and highly inclusive. The attainment of the defined characteristics for Education 5.0 would thus represent a major step towards redefining the overall education landscape.

Focus areas	Intended benefits
• Improve digital infrastructure and embrace educational technologies to provide engaging and customised learning experiences. • Strengthen policy frameworks and increase funding to promote innovative approaches and align with international standards.	• Improved educational outcomes • Increased accessibility • Suitability towards industry needs • High economic growth • Increased global competitiveness

The growth trends in Indian education align with the necessary transition journey towards Education 5.0.

Roll-out: National-level initiatives should be undertaken by collaborating with major educational institutions in the country.

Localise: Curriculum design and delivery must be localised to meet regional needs and promote inclusivity and relevance.

Measure: A continuous monitoring system should be incorporated for assessing the outcomes and collecting feedbacks at regular intervals for improvement.

By embracing Education 5.0, India can be at the forefront for setting educational standards according to global benchmarks, by leveraging innovation and adoption of new-age technologies in the near future.

7.2. Call to action for stakeholders in the education ecosystem

- **Educators:** Instructors need to continuously adapt to new-age teaching methods that help in professional skill development and provide opportunities to mentor their peers.

- **Students and parents:** Parents should advocate for modernisation in educational delivery and students should exercise flexibility by making use of new-age technologies.

- **Government:** The Government should line up the NEP with the standard framework of Education 5.0. They should also plan out investments for technology integrations and facilitate public–private partnerships.

- **Educational institutions:** Institutions should design and develop innovative curriculums that cultivate inclusive educational teaching methods and promote research activities.

- **Industry:** The industry can enhance current educational curriculum by partnering with educational institution boards and offering internships and apprenticeships for students to provide them with real-world exposure.

8

Appendices

8.1. Glossary

Term	Definition
New Education Policy (NEP)	The NEP seeks to transform India's educational system by encouraging students' adaptability, innovation and all-round growth.
NASSCOM	Being one the leading trade groups for the IT and business process management sectors in India, NASSCOM promotes growth and innovation through policy advocacy.
UNESCO	To support world peace and sustainable development, UNESCO encourages international collaborations in education, research, culture and communication.
Global Virtual Learning Consortium (GVLC)	To improve educational innovation and accessibility globally, the GVLC promotes international collaboration in virtual learning.
NISHTHA	NISHTHA is a project by the Government of India, which aims to improve educational quality across the country by providing teachers and school administrators with extensive training.
DIKSHA	To enhance individualised learning and raise academic standards, DIKSHA – an Indian digital platform – offers teachers and students carefully selected educational tools and information.

8.2. Additional data and analysis

Snapshot: Educational growth analysis across continents

Country	Educational state	Characteristics
US	Education 4.0	High adoption of advanced technologies (EdTech), strong government policies and personalised learning
China	Between Education 3.0 and 4.0	Widespread digital learning platforms, strong AI and VR/AR integration, significant government investments; prevalence of regional disparities
India	Between Education 3.0 and 4.0	Rapid growth of e-learning platforms, increasing use of AI in education, strong Government initiatives like Digital India; prevalence of regional disparities
Japan	Between Education 3.0 and 4.0	Integrating AI technology into teaching, strong focus on STEM and adaptive learning; resistance in forgoing traditional learning methods
Germany	Education 4.0	Adoption of advanced technologies in schools, governmental support in overcoming infrastructural limitations
UK	Between Education 3.0 and 4.0	Extensive use of digital tools, adoption of skill development platforms, government support for innovation
South Africa	Between Education 2.0 and 3.0	Increasing internet penetration, online learning (mobile); infrastructural limitations and initiatives from the government (nascent stage)
Australia	Between Education 3.0 and 4.0	Strong collaboration with industries, robust government initiatives, focus on vocational learning; lack of proficient teachers
South Korea	Education 4.0	High internet penetration, extensive use of AI, VR/AR in education, personalised learning, strong governmental support
Brazil	Between Education 2.0 and 3.0	Usage of digital tools, adoption of e-learning platforms adoption; significant disparity in urban–rural areas
Singapore	Between Education 3.0 and 4.0	Strong industry collaboration, highly effective government involvement, emphasis on STEM; limitations in the assessment system and teaching pedagogy
UAE	Between Education 3.0 and 4.0	Government-led standardised system, highly accessible, with global partnerships, focus on vocational and technical education, industry-based curriculum development; constraints with traditional teaching and dropouts
France	Between Education 3.0 and 4.0	Comprehensive and centralised system managed by the government, emphasis on academic excellence: gaps in education between regions and difficulties in innovation
Finland	Between Education 3.0 and 4.0	Interdisciplinary learning, minimal standardised testing, strong emphasis on personality-centred approach of learning; difficulties in integration of technological advancements into teaching and learning
Canada	Between Education 3.0 and 4.0	Professional autonomy, micro-credentialing, diverse and innovative learning, accessibility to all; restricted by funding and resources
Netherlands	Education 4.0	Holistic learning, innovative pedagogy, strong focus on vocational education and training (VET), well integrated with industry needs; constraints in qualified resources
Malaysia	Between Education 2.0 and 3.0	Global partnerships and internationalisation, significant government involvement, emphasis on TVET; lack of accessibility and quality education
Sweden	Between Education 3.0 and 4.0	Holistic evaluation and assessment, focus on overall student development, technology integration; constraints in qualified resources

Source: PwC analysis

About ASSOCHAM

ASSOCHAM initiated its endeavour of value creation for Indian industry in 1920. It brings in actionable insights to strengthen the Indian ecosystem, leveraging its network of more than 4,50,000 members, of which MSMEs represent a large segment. With a strong presence in states, and key cities globally, ASSOCHAM also has more than 400 associations, federations and regional chambers in its fold.

Aligned with the vision of creating a New India, ASSOCHAM works as a conduit between the industry and the Government. The Chamber is an agile and forward-looking institution, leading various initiatives to enhance the global competitiveness of the Indian industry, while strengthening the domestic ecosystem. With more than 100 national and regional sector councils, ASSOCHAM is an impactful representative of the Indian industry. These Councils are led by well-known industry leaders, academicians, economists and independent professionals. The Chamber focuses on aligning critical needs and interests of the industry with the growth aspirations of the nation.

ASSOCHAM is working hand in hand with the government, regulators and national and international think tanks to contribute to the policy making process and share vital feedback on implementation of decisions of far-reaching consequences. In line with its focus on being future-ready, the Chamber is building a strong network of knowledge architects. Thus, ASSOCHAM is all set to redefine the dynamics of growth and development in the technology-driven knowledge-based economy. The Chamber aims to empower stakeholders in the Indian economy by inculcating knowledge that will be the catalyst of growth in the dynamic global environment.

Vision

Be the knowledge architect for the Indian economy, with a focus on strengthening India's domestic ecosystem and enhancing global competitiveness.

Mission

Its mission is to impact the policy and legislative environment so as to foster balanced economic, industrial and social development.

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