

Asia's Future Workforce



Shaping Responsive Education
and Employment Policies
for Youth and Beyond



Asia's Future Workforce

*Shaping Responsive Education and
Employment Policies for Youth and Beyond*

Publisher Information

Asia's Future Workforce: Shaping Responsive Education and Employment Policies for Youth and Beyond is jointly published by the Konrad-Adenauer-Stiftung's (KAS) Regional Economic Programme Asia (SOPAS) and the Taiwan-Asia Exchange Foundation (TAEF).

Publication Coordination: Cristita Marie Perez, Boon Yee Lim
Design, Layout, and Typeset Artist: Paula Duman

© 2024, Konrad-Adenauer-Stiftung SOPAS and Taiwan-Asia Exchange Foundation
ISBN No. 978-4-910690-20-9

Publishers:

Konrad-Adenauer-Stiftung Japan Office/ Regional Economic Programme Asia (SOPAS)

Sanno Park Tower 25F, 2-11-1 Nagatacho, Chiyoda-ku, Tokyo, 100-6125



+81-3-6426-5041



KAS-Tokyo@kas.de



www.kas.de/japan

Taiwan-Asia Exchange Foundation

Room 1107, 11F, NO.136, Section 3, Ren'ai Road, Da'an District, Taipei City, 10657, Taiwan



+886-2-2700-2367



service@taef.org



<https://www.taef.org/>

All rights reserved. No part of this publication may be reprinted, reproduced or utilized in any form or by any electronic, mechanical or other means, now known or hereafter invented, including photocopying or recording, or in any information storage or retrieval system, without permission from the publishers.

The responsibility for facts and opinions in this publication rests exclusively with the authors and their interpretations do not necessarily reflect the views or the policy of the Konrad-Adenauer-Stiftung and/or the Taiwan-Asia Exchange Foundation.

Table of Contents

Publisher Information	iv
Abbreviations	viii
Foreword Paul Linnarz Konrad-Adenauer-Stiftung Regional Economic Programme Asia (SOPAS)	xiii
Foreword Dr. Hsin-Huang Michael Hsiao Taiwan-Asia Exchange Foundation (TAEF)	xiv
Introduction	xvi
Section I. Southeast Asia	1
Empowering ASEAN Youth for Work in the Digital Era Lurong Chen	3
Building a Resilient and Inclusive Future: Strengthening Indonesia's Education System to Prepare the Next Generation to Tackle Global Challenges Julia Novrita	23
Future-Ready Education: Integrating Higher Order Thinking Skills in Malaysia Kirjane Ngu	38
Section II. South Asia	57
Future of Work for Asia's Youth: How India Prepares Itself for the New Challenges Partha Pratim Mitra	59
The Future of Work for Nepal's Youth: Challenges and Opportunities Mr. Mahesh Raj Bhatta	80

Section III. East Asia	95
Future of Youth Employment in Japan Yukie Hori	97
Meeting the Challenges Facing Korean Youth Randall Jones	113
Employment Opportunities and Labor Risks for Taiwanese Youth under Current Technological Changes Dr. Lee Chien-Hung	141
Conclusion and Policy Recommendations	152

Abbreviations

1M1P	1Student 1Project
AI	Artificial Intelligence
AIoT	Artificial Intelligence of Things
ALMPs	Active Labot Market Policies
AQRF	ASEAN Qualifications Reference Framework
AR	Augmented Reality
ASEAN	Association of Southeast Asian Nations
ASUSE	Annual Survey of Unincorporated Sector Enterprises
BOS	School Operational Assistance
CEFR	Common European Framework of Reference for Languages
CLM	Cambodia, Laos, and Myanmar
CSAT	College Scholastic Ability Test
CTS	Craftsman Training Scheme
DAI	Digital ASEAN Initiative
DDU-GKY	Deen Dayal Upadhyaya Grameen Kaushalya Yojana
DGT	Directorate General of Training
DST	Doul System of Training
EBTANAS	National Final Learning Standardized Testing Evaluation
ECCE	Early Childhood Care and Education
EdTech	Educational Technology
EPFO	Employees' Provident Fund Organization
FTE	Full-Time Equivalent
GCC	Gulf Cooperation Countries
GDP	Gross Domestic Product
GER	Gross Enrolment Rates

GERD	Gross Domestic Expenditure on Research and Development
GII	Global innovation Index
GNI	Gross National Income
HDI	Human Development Index
HEIs	Higher Educational Institutes
HOTS	Higher-order Thinking Skills
HRC	Human-Robot Collaboration
IC	Integrated Circuit
ICT	Information and Communications Technology
IIMs	Indian Institutes of Management
IITs	Indian Institutes of Technology
ILO	International Labour Organization
IMD	Lausanne International Institute for Management Development
IoT	Internet of Things
IT	Information Technology
ITIs	Industrial Training Institutes
JSS	Jan Sikhshan Sansthan
KPIs	Key Performance Indicators
KSSM	Kurikulum Standard Sekolah Menengah (Secondary School Standard Curriculum)
KSSR	Kurikulum Standard Sekolah Rendah (Primary School Standard Curriculum)
LFPRs	Labor Force Participation Rates
LMIs	Labor Market Indicators
LOTS	Lower-Order Thinking Skills
MIA	Malaysian Innovative Agency
MLM	Multi-Level Marketing
MoE	Ministry of Education (Malaysia)
MoHE	Ministry of Higher Education (Malaysia)

Asia's Future Workforce: Shaping Responsive Education
and Employment Policies for Youth and Beyond

MSDE	Ministry of Skill Development and Entrepreneurship (India)
MSME	Micro, Medium and Small Enterprises
NAPS	National Apprenticeship Promotion Scheme
NCVET	National Council for Vocational Education and Training
NDC	National Development Council (Taiwan)
NEET	Neither Employed, nor Engaged in Formal Education or Training
NEP	New Education Policy
NOC	No Objection Certificate
NPQS	National Preschool Quality Standards
NSDC	National Skill Development Corporation
NSO	National Statistical Office (India)
NSQF	National Skills Qualification Framework
NSSO	National Sample Survey Office
NULM	National Urban Livelihood Mission
OECD	Organization for Economic Cooperation and Development
OJT	On Job Training
PAJSK	Pentaksiran Aktiviti Jasmani, Sukan Dan Kokurikulum
PISA	Programme for International Student Assessment
PLFS	Periodic Labor Force Surveys
PMEP	Prime Minister Employment Program
PMKVY	Pradhan Mantri Kaushal Vikas Yojana
PP	Pentaksiran Pusat
PPDB	Student Admission Regulations
PPP	Public-Private Partnerships
PPP	Purchasing Power Parity
PPsi	Pentaksiran Psikometrik
ProELT	Professional Upskilling for English Language Teachers
PS	Pentaksiran Sekolah
R&D	Research and Development

RPP	Lesson Plan
RSETI	Rural Self Employment Training Institutes
RYSS	Regional Youth Support Stations
SEA-PLM	Southeast Asia Primary Learning Metrics
SEO	Search Engine Optimization
SHI	Skill Hubs Initiative
SIM	Skill India Mission
SIMO	Skills India Mission Operation
SMEs	Small and Medium Enterprises
SMK	Vocational Schools
SNU	Seoul National University
SPM	Sijil Pelajaran Malaysia (Malaysian Certificate of Education)
SSCs	Sector Skill Councils
STEM	Science, Technology, Engineering, and Mathematics
STI	Science, Technology and Innovation
TALIS	Teaching and Learning International Survey
TIMSS	Trends in International Mathematics and Science Study
TVET	Technical and Vocational Education and Training
UMPTN	State University Entrance Examination
UN	National Exam
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations International Children's Emergency Fund
UPSR	Ujian Penilaian Sekolah Rendah (Primary School Achievement Test)
UR	Unemployment Rate
USBN	National Standard School Examination
USD	United States dollar
VR	Virtual Reality

Asia's Future Workforce: Shaping Responsive Education
and Employment Policies for Youth and Beyond

WIDE	World Inequality Database on Education
WIPO	World Intellectual Property Organization
WPR	Worker Population Ratio
YDI	Youth Development Index

Foreword

As Asia's economies continue to expand and diversify, its current and future workforce will play critical roles in sustaining its place as the globe's most dynamic region. Demographic shifts, technological change, and geopolitical uncertainty are reshaping both the labour market and education systems across Asia.

Responsive policies that anticipate future trends, foster skill development, and promote innovation are essential in ensuring that Asia's workforce remains both competitive and inclusive. This critical intersection between education systems and employment policies is the main motivation behind the joint publication, *Asia's Future Workforce: Shaping Responsive Education and Employment Policies for Youth and Beyond* by Konrad-Adenauer-Stiftung's (KAS) Regional Economic Programme Asia (SOPAS) and the Taiwan-Asia Exchange Foundation (TAEF).

Contributions from selected countries in East, South, and Southeast Asia provide analyses of the current employment landscape, including specific industries or sectors where the youth are more prevalent, and the challenges they face in entering and sustaining employment. Emerging job trends in Asia and how these impact opportunities for the youth are also explored. These country case studies probe how well Asia's different education systems, and its governments are addressing the skills gaps to better prepare the youth for the evolving job market. We hope that the thoughtful recommendations outlined in the publication will serve both as a guide and a call to action for governments, education and business leaders to not only address immediate workforce needs but also prepare for long-term economic shifts.

Paul LINNARZ

Director, Regional Economic Programme Asia (SOPAS)
Country Representative, Japan
Konrad-Adenauer-Stiftung

Foreword

In August 2020, amidst the global disruption caused by the COVID-19 pandemic, the Taiwan-Asia Exchange Foundation (TAEF) and the Konrad-Adenauer-Stiftung's Regional Economic Programme Asia (KAS SOPAS) launched the "Future of Work for the Asian Youth" research series. Featuring webinars and individual reports on Indonesia, Vietnam, Malaysia, and Taiwan, this initiative was designed to shed light on the evolving employment landscape for Asia's young people, who were among the most disproportionately affected by the pandemic's economic and social impacts.

Today, megatrends such as globalization, digitalization, and climate change continue to reshape how we learn, live, and work. Geopolitical uncertainties, coupled with demographic shifts—such as India's rise as the most populous country and Asia-Pacific's status as home to over 50% of the world's youth—have made it essential to ensure that the next generation can navigate the increasingly complex labor market.

Building on accumulated insights over the past few years, it is with great pleasure that the TAEF and KAS SOPAS present the report *Asia's Future Workforce: Shaping Responsive Education and Employment Policies for Youth and Beyond*, a comprehensive analysis of the future of work across eight Asian nations, namely Indonesia, Malaysia, India, Nepal, Japan, South Korea, and Taiwan, along with sub-regional comparisons in Southeast Asia. It addresses pivotal issues such as education, digitalization, gender disparities, and industrial development affecting youth in these countries. It also concludes with in-depth policy recommendations to inspire responsive actions from governments and stakeholders, with exploration of regional collaboration avenues.

The TAEF, since its establishment in 2018, has been dedicated to fostering regional cooperation and promoting Taiwan's New Southbound Policy (NSP). Through efforts such as the Yushan Forum and partnerships with key international organizations, TAEF has played a pivotal role in connecting Taiwan with the broader regional policy community. This publication is an extension of those efforts. It reflects our commitment to addressing shared challenges and offering innovative solutions for the future workforce in Asia—as part of our vision to establish an NSP Youth Corridor under the next phase of NSP to strengthen collaboration and resource sharing between young leaders in Asia and beyond.

Finally, on behalf of TAEF, I extend my deepest gratitude to the entire TAEF team, KAS-SOPAS under Mr. Paul Linnarz's leadership, and the many contributors across Asia who made this intellectual journey possible. Together, we hope this report will contribute to a more prosperous and inclusive future for Asia's youth.



Hsin-Huang Michael HSIAO

Chairman,
Taiwan-Asia Exchange Foundation

Introduction

Cristita Marie Perez

Asia's role in the global economy is more critical than ever, as the region's dynamic growth and influence extend far beyond its borders. As home to the world's largest and most diverse labor force, the region's ability to equip its workers, particularly its youth, with future-ready skills will have profound implications not only for its own development but also for global innovation, competitiveness, and social stability. To harness this potential and ensure continued growth, the region must craft education and employment policies that are responsive to the unprecedented challenges brought about by technological advancements, demographic shifts, and economic transformation.

Asia's Workforce Faces Complex Challenges

Asian countries face unique but interconnected challenges in preparing their future workforce. Technological disruption manifesting through intense and wide-spread automation, AI, and digital transformation are restructuring industries, necessitating new skills and rendering certain occupations obsolete. Demographic shifts such as the aging population in countries like Japan and South Korea, and the youth bulge in economies like India, the Philippines, and Indonesia further present unique challenges in formulating inclusive employment policies. Additionally, the uneven access to quality education across the region worsens rural-urban divides, gender disparities, and socio-economic inequalities.

Disruptions and Transformations Bring Opportunities

Although rapid technological disruption presents threats, these changes also present significant opportunities. New and emerging industries such as renewable energy, digital economies, and creative industries have the potential to create high-value jobs if the right educational and training policies are in place. Additional opportunities for labor mobility, regional cooperation on education, and shared innovation are also presented through Asia's growing integration through regional organizations such as the ASEAN and the expansion of cross-border trade and investment.

Asia is well-positioned to turn disruption into opportunity and lead the world in workforce development and economic resilience through responsive governance - fostering countries to proactively develop adaptable, data-driven, and forward-looking policies.

Education and Employment Policies Play Critical Roles

Education systems play a foundation role in preparing Asia's future workforce. It is crucial for education curricula to evolve with industry trends. A critical analysis of the impact of automation through national workforce assessments in key sectors such as healthcare, education, and green technologies will help education systems craft the responsive frameworks that develop not just technical skills, but also soft skills such as critical thinking, problem-solving, and adaptability.

In addition, national frameworks for lifelong learning for workers at all career stages give them opportunities to refresh their skills and remain employable. Policies supporting adult education, retraining programs, and flexible learning models should be developed. Specifically, investment should be made in digital infrastructure to support online education, training, and job-matching platforms. Digital platforms can provide broader access to education and jobs, especially in regions where physical infrastructure might be lacking.

Education programs that teach business skills in addition to the soft skills previously mentioned can encourage entrepreneurship and innovation. Promoting entrepreneurial skills will encourage individuals to create their own job opportunities and economic diversification. Innovation driven by entrepreneurship is crucial to economic resilience in a highly volatile, though connected global economy. These entrepreneurial ecosystems can be supported through increasing access to finance, expanding mentorship programs, and developing innovation hubs.

Employment policies must also be flexible and future-oriented, carving out space for workers to continuously upskill and reskill as industries evolve. As economic integration in Asia deepens, there will be a greater need for flexible labor movements to address regional workforce shortages and skill gaps. Adopting regional and cross-border labor mobility policies will also allow workers to gain diverse experiences and higher paying opportunities.

Both education and employment policies should also foster inclusivity by facilitating and increasing access for vulnerable groups such as the youth, women, and rural populations. Collaboration among governments, businesses and industries, and educational institutions play a critical role in ensuring that

Asia's Future Workforce: Shaping Responsive Education and Employment Policies for Youth and Beyond

curricula and skills development, particularly in areas like digital literacy, STEM, and soft skills (e.g., critical thinking, communication, etc.), and vocational training programs align with labor market demands.

This Publication

Asia's Future Workforce: Shaping Responsive Education and Employment Policies for Youth and Beyond jointly published by the Konrad-Adenauer-Stiftung's (KAS) Regional Economic Programme Asia (SOPAS) and the Taiwan-Asia Exchange Forum (TAEF), intends to provide insights, research, and policy recommendations to policymakers, educators, and business leaders for developing the region's future-ready workforce. It is organized into three main sections covering case studies from Southeast, South, and East Asia. The country chapters cover the following key themes:

- Analyzing technological and demographic trends
- The future of education and skills development
- Education and employment policy recommendations and actionable strategies

The future of Asia's workforce rests on our ability to anticipate change, adapt policies, and collaborate across sectors. The publication sets the tone for forward-thinking, evidence-based discussions and invites stakeholders to actively engage in helping Asia overcome complex challenges and build a resilient and adaptable workforce that drives sustainable growth.



Section I. Southeast Asia

Empowering ASEAN Youth for Work in the Digital Era

Lurong Chen¹

Abstract

ASEAN's large pool of young workforce provides a promising outlook for regional development. While preparing the youth for the future of work, ASEAN member states are facing hindering factors such as lower education attainment, limited labour opportunities, and gender inequality.

This essay discusses the importance of improving education and capacity building for ASEAN youth in the digital era. It highlights two policy areas that are worth particular emphasis – (i) regional effort on leveraging technology and digital learning in ASEAN, and (ii) the enhancement of academic-industry collaboration that can help align education with market needs. Moreover, regional collaboration among ASEAN countries, such as creating region-wide inter-operable educational standards and framework, can help increase consistency in quality and content of youth education.

1. Background

ASEAN is “a region that celebrates youth and their dynamism.” (ASEAN, n.d.) One third of its total population is aged between 15 and 34. The youth population is projected to peak at over 220 million by 2038. When digitalization opens a new chapter of ASEAN development, whether the region can sustain its growth in the digital era depends on how well it can unleash the potential of ASEAN youth.

With digitalization, the workforce armed with high-tech tools can significantly improve its capacity and productivity. As the Internet and other online resources accelerate the speed of knowledge diffusion and renewal, some skills and knowledge that previously only experts had, will soon be grasped by the public. This leads to higher requirements for skills and quality of

1 Email to Lurong.chen@eria.org

labour. The workforce in the digital era should be able to adapt promptly to the new business environment, learn quickly about new technologies and business models that continuously emerge in the market, and capture necessary technical skills to handle the new tools proficiently in real-world problem solving.

On the one side, emerging digital technologies will lead to disruptions and changes in the nature of jobs and worker skills. The role of human capital development and innovation capacity as determinants of long-run competition capacity is highlighted in the digital economy, which is knowledge-intensive. It has been widely accepted, by policymakers, businesses and the public, that the pace of knowledge metabolism in the digital age is getting faster and faster. Education must be a continuous process that stays throughout human life rather than just being a stage in one's lifetime. On the other side, applying digital tools and new services has potentials to widen the coverage, improve the quality and drive down the cost of education. In particular, easy access to the Internet can open a new door for knowledge acquirement and skill improvement.

This essay discusses the importance of improving education and capacity building for ASEAN youth facing the opportunities and challenges brought by digitalization. It provides policy recommendations to unlock the potential of ASEAN youth by creating an inclusive education- and development-ecosystem to stimulate their innovation and creativity in the digital economy.

2. Labour Productivity and Human Development in ASEAN

ASEAN has a large pool of young workforce. According to the World Bank (2024), more than two-thirds of ASEAN's 455 million workforce population² in 2021 is aged between 15 and 44. It is projected that by 2035, among every nine young workers, at least one of them comes from ASEAN. Economically, the abundance in human resources provides a promising outlook for the development of the regional economy, from both the demand and supply sides. As Indonesian president Jokowi remarked at the 42nd ASEAN Summit, *"ASEAN youth will play an important role in the sustainability of Southeast Asia as a stable and peaceful region, as well as in becoming the Epicenter of Growth."*³ However, the productivity of ASEAN labour is still generally low, due to

2 Workforce is defined as labors aged between 15 and 64.

3 <https://setkab.go.id/en/president-jokowi-opens-42nd-asean-summit/>

some hindering factors such as lower education attainment, limited labour opportunities, and gender inequality.

The overall level of literacy in ASEAN has significantly increased in the past four decades. The share of illiterate population in ASEAN's total population has been driven down to around 7 percent. Most ASEAN member states, except Cambodia, Lao PDR, and Myanmar (CLM countries), have higher than 90 percent literacy rates. The size of literate population is not neglectable. According to UNESCO (2019), there were still over 30 million illiterate population older than 15 years in ASEAN by the end of 2016. More than 30 percent of them are in Myanmar. Around 16 percent of illiterate population in Myanmar are between 15 and 24 years old.

Overall, the productivity of ASEAN workers is still much lower than that of the world average level. The recent ILO-modelled estimations show that ASEAN's average annual output per worker in 2023 was around 9,000 USD, around 37 percent of that of the world average level. (see Figure 1)

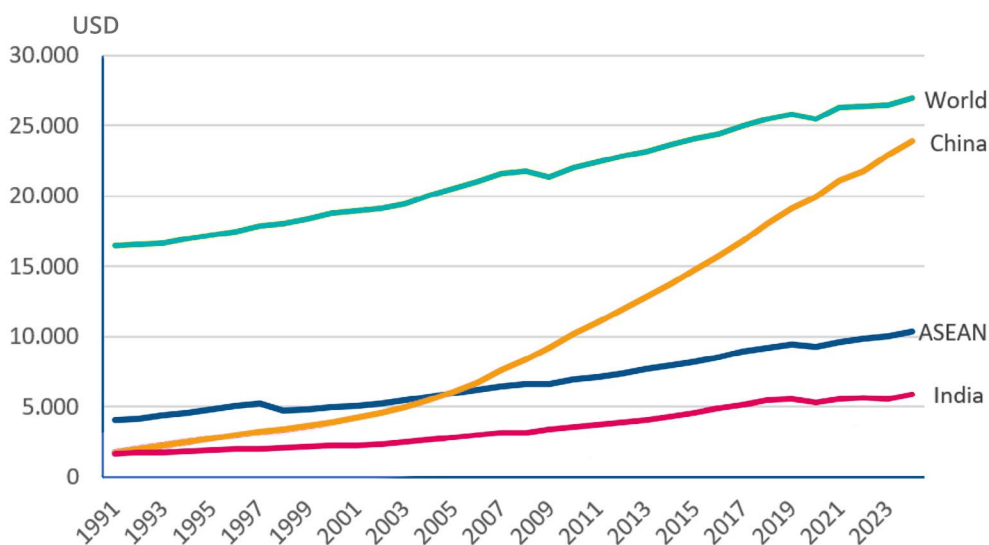


Figure 1: Output per Worker (GDP constant 2015 USD)

Source: the Author. Raw data from ILO. <https://ilostat.ilo.org/topics/population-and-labour-force/>

Based on ILO's estimation, the average annual output per ASEAN worker has witnessed significant growth in the past three decades, rising from 4,000

Asia's Future Workforce: Shaping Responsive Education and Employment Policies for Youth and Beyond

USD in 1991 to 10,000 USD in 2023. By 2023, per ASEAN worker output was almost twice as much as that of an Indian worker. But ASEAN's growth in labour productivity seemed relatively slow when comparing to China, whose average labour productivity has increased by over ten times during the same period. In 1991, average output per worker in China was equivalent to only 40 percent of that in ASEAN, while in 2023, one Chinese worker seemed to be as productive as two ASEAN workers.

Within ASEAN, there are wide gaps of human development across member states. While Singapore, Brunei Darussalam and Malaysia are on the high end of labour productivity, CLM and Viet Nam are still on the relatively low productivity side. By indexing the average output per workers related to that in 2010, Figure 2 reveals the catching up of ASEAN labour productivity. Per worker output in ASEAN member states, except that of Brunei Darussalam, increased significantly during the period between 2010 and 2024. CLM and Viet Nam saw 60% to 100% productivity growth in the past 15 years.

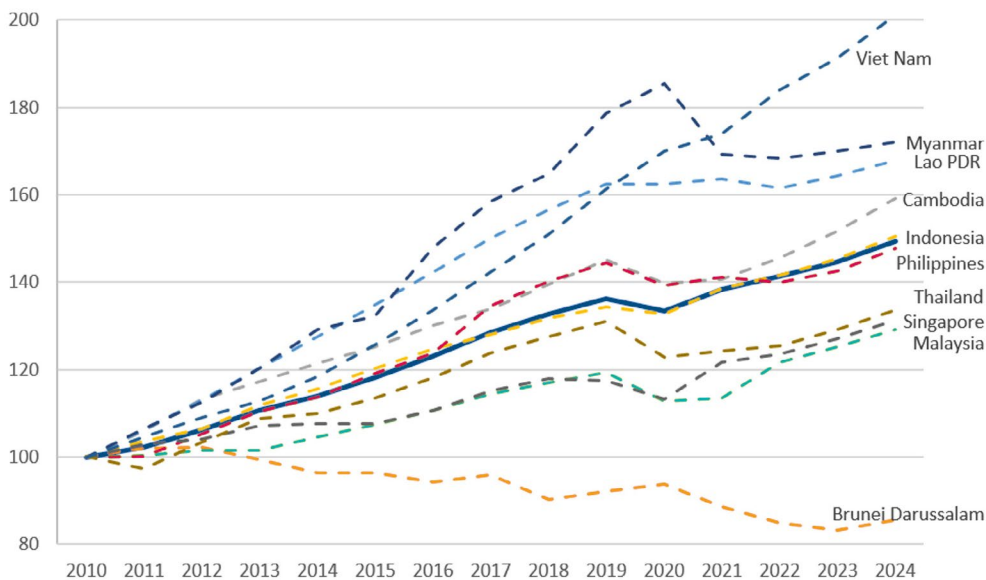


Figure 2: Growth of Output per Worker, 2010 – 2024

Source: the Author. Raw data from ILO.

It is worth noting that the gaps in labour productivity between some ASEAN countries widened in absolute terms. For instance, in 2023, Singapore's per

worker output was 37 times as much as that of Cambodia. The gap seemed much smaller than in 2010, which was 44 times the difference. However, the absolute difference in labour productivity between Singapore and Cambodia indeed increased from 83,000 USD to 105,000 USD during this period.

According to UNDP (2024), the levels of human development in ASEAN vary across countries. Brunei Darussalam, Malaysia, Singapore, and Thailand were qualified as countries with “*very high human development*”; Indonesia, Philippines, and Viet Nam were countries with “*high human development*”; and CLM were in the group of “*medium human development*”. (Table 1) When using WIPO’s Global Innovation Index (GII) as the proxy to measure countries’ overall innovation capacity, one can see that ASEAN member states rank higher in the GII than in the Human Development Index (HDI). As for youth development, Singapore was ranked World No.1 in the latest Global Youth Development Report. (The Commonwealth, 2024) Viet Nam, Indonesia and Cambodia seemed to offer better opportunities for youth development relative to their overall human development level, while Thailand and the Philippines were lower ranked in the Youth Development Index (YDI).

Country	HDI			GII			YDI	
	HDI group	Rank	Score	Overall Rank	Output Rank	Input Rank	Rank	Score
Singapore	Very High	9	0.95	5	12	1	1	0.830
Brunei Darussalam	Very High	55	0.82	87	125	53	49	0.692
Malaysia	Very High	63	0.81	36	46	30	50	0.699
Thailand	Very High	66	0.80	43	43	44	84	0.574
Viet Nam	High	107	0.73	46	40	57	63	0.661
Indonesia	High	112	0.71	61	63	64	88	0.578
Philippines	High	113	0.71	56	52	69	133	0.522
Lao PDR	Medium	139	0.62	110	120	100	136	0.476
Myanmar	Medium	144	0.61	-	-	-	130	0.466
Cambodia	Medium	148	0.60	101	100	97	97	0.568

Table 1: ASEAN Human Development

Source: the Author. Raw data from UNDP (2024), WIPO (2023), The Commonwealth (2024)

3. Improving ASEAN Youth School Education

Labour productivity and education are closely related. In Figure 3, the dash line in green shows positive correlation between the output per worker and the level of education using the UNDP Education Index as the indicator. The value of the Education Index ranges from 0 to 1. Higher value represents higher education level in general. Simply put, ASEAN countries can be categorized into three groups, based on the scores of the Education Index. **Group A** includes Singapore, Malaysia and Brunei. These countries have scores higher than 0.7. **Group B** are the ones with scores between 0.5 and 0.7. Countries in this group are China, India, Indonesia, Philippines, Thailand, and Viet Nam. Countries of **Group C** are CLM with scores less than 0.5.

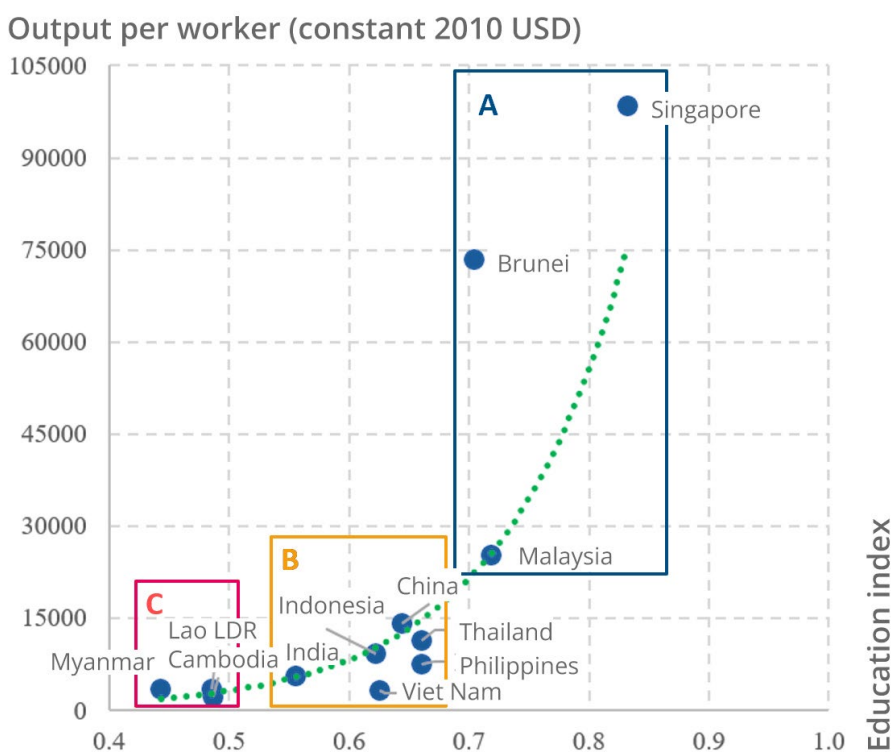


Figure 3: Labour Productivity and Education

Source: the Author. Raw data from ILO (2024) and UNDP (2024).

Although it needs more robust econometric analysis to figure out the causality between education and worker output, the correlation between the two seems to be clear: higher education level leads to higher level of output per

worker. Moreover, the exponential trend curve reveals that the difference in the output level of group A countries and that of group B is much larger than that between group B and C. In this regard, educating ASEAN youth is vital not only for productivity growth, but also for inclusive development in the region.

To get the ASEAN youth ready for the future of work, school education and Technical and Vocational Education and Training (TVET) will be the two main mechanisms of educating people in the digital age. As for school education, ASEAN countries can consider policy effort from the following three aspects: (i) increasing the effective length of school education, (ii) improving the quality of learning and teaching, and (iii) reducing inequality and increasing inclusiveness of education.

3.1 Increasing the length of school education

Figure 3 reveals that the value of UNDP Education Index and the country's average year of total school education are positively correlated. In general, labourers in Group A countries get more than 9 years of total schooling on average, those in Group B countries have 6 to 9 years of schooling, and labourers in group C countries normally have less than 6 years of total schooling.

According to UNDP (2024), the mean years of schooling in countries with “very high human development”, “high human development” and “medium human development” are 12.3, 8.6, and 6.7 respectively. For most ASEAN member states, the mean year of schooling is generally lower than that of the groups where they belong to. Among the four ASEAN countries with “very high human development”, Thailand is the only one that has less than 80 percent of its population ages 25 and over that have completed lower secondary education. Only around 40% of Thai population older than 25 that has completed upper secondary education. The value was even lower than that of Viet Nam and Indonesia. (Table 2)

Asia's Future Workforce: Shaping Responsive Education and Employment Policies for Youth and Beyond

Country	HDI group	Mean years of schooling	Variation from the HDI group's average level	at least completed lower secondary	at least completed upper secondary
Singapore	Very High	11.92	-0.3	86.1	79.8
Brunei Darussalam	Very High	9.22	-3.0	87.5	68.8
Malaysia	Very High	10.75	-1.5	80.6	69.8
Thailand	Very High	8.83	-3.4	53.6	39.3
Viet Nam	High	8.46	-0.2	66.4	41.9
Indonesia	High	8.56	-0.1	56.7	39.6
Philippines	High	8.97	0.3	61.9	34.5
Lao PDR	Medium	5.95	-0.7	40.4	24.0
Myanmar	Medium	6.52	-0.2	42.6	22.8
Cambodia	Medium	5.20	-1.5	38.7	11.5

Table 2: Length of Education

Source: UNDP

On average, people working in Singapore spend more years at school compared to those in the other Asian countries. Eighty-six percent of Singaporeans finish their middle school education before age 25, of which more than 90% finish their high school education as well. This could be one of the factors that contribute to the country's high ranking in innovation and youth development. Jobs in the coming decades will have higher requirements on workers' knowledge of science and technology as well as the capacity of using digital tools and complex devices. Six years of schooling will not be sufficient to train the young to acquire the necessary learning skills. Prolonging schooling years and increasing the youth's secondary education attainment seems to be an intuitive but effective solution for youth capacity building.

3.2 Improving the quality of education

The quality of school education depends on how well the students are taught and trained. In the OECD's Programme for International Student

Assessment (PISA) survey in 2023, among the 81 participating countries, Singapore led the global league tables in the PISA assessment, while the other ASEAN member states' global ranking varied from 34th (Viet Nam) to 81st (Cambodia) respectively.⁴

A country's PISA score tends to increase as its government increases the per student expenditure on primary and secondary education. (See Figure 4) In particular, the first 1,000 or 2,000 USD government expenditure seems to be critical to improve the quality of basic education. The marginal effect of expenditure increases on quality of education decreases overtime.

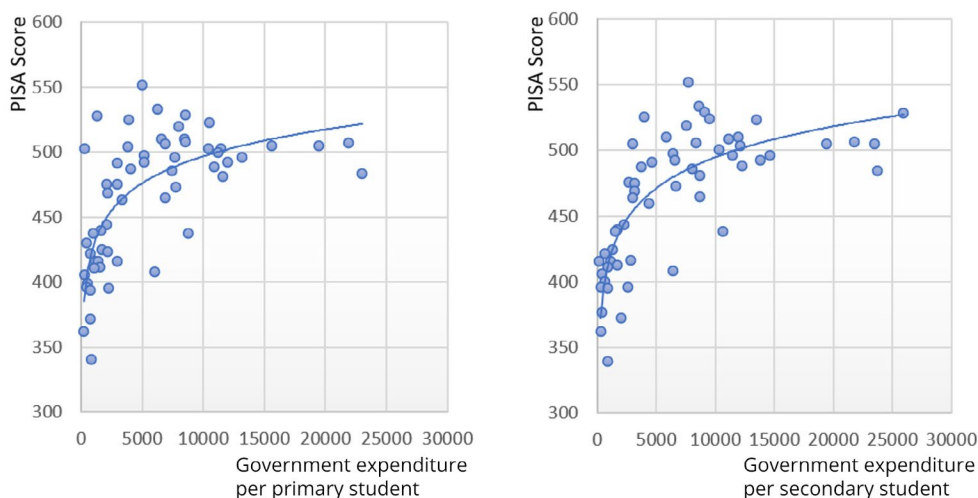


Figure 4: Average PISA Score and Government Expenditure per Student

Source: The Author. Raw data from <https://www.oecd.org/en/data/datasets/pisa-2022-database.html#data> and <https://datatopics.worldbank.org/world-development-indicators/>

Furthermore, the comparison of the values of the pupil-teacher ratio and government expenditures on education in ASEAN reveals twofold information. (see Table 3) There are gaps in education inputs across countries. According to the World Bank (2024), Indonesia, Malaysia, Singapore, Thailand, and Viet Nam spent around one-fifth of total government expenditure on education, higher than the world average

4 Based on the average (PISA) scores in mathematics, reading and science.

Asia's Future Workforce: Shaping Responsive Education and Employment Policies for Youth and Beyond

level (14 per cent on average). But in CLM, government expenditure on education as share of total government expenditure are much lower; and each teacher faces more pupils but with less available resources when compared to other Asian countries. For instance, in the primary schools in Cambodia, one teacher typically needs to teach 25 more pupils than his/her colleagues in Singapore, while on average, the expenditure per primary student by the Cambodian government is equivalent to slightly higher than 2 percent of that spent by the Singaporean government. Similarly, per student government expenditure on secondary education in Cambodia is only 1.5 percent as much as that in Singapore.

Country Name	Pupil-Teacher Ratio ⁱ			Government Expenditure per Student (USD PPP) ⁱⁱ			Government Expenditure on Education ⁱⁱⁱ	
	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary	as % of GDP	as % of total government expenditure
Brunei	10.2	8.7	12.2	7016	18763	25306	4.4	11.4
Cambodia	41.7	28.9	13.9	212	245	212	1.9	8.8
Indonesia	16.1	15.3	27.6	1634	1290	3513	3.6	20.5
Lao PDR	22.3	18.1	12.0	632	871	1419	2.9	12.2
Malaysia	11.7	12.3	13.9	4830	6332	7745	4.7	21.1
Myanmar	23.0	26.4	57.2	474	739	1029	2.2	10.2
Philippines	29.0	23.5	23.7	751	759	876	2.7	13.2
Singapore	15.1	11.7	14.3	10330	15682	21035	2.9	20.0
Thailand	16.2	24.2	24.6	4164	3217	3253	4.1	19.1
Vietnam	19.6	n.a.	24.6	1416	n.a.	2290	5.7	18.5
World	23.6	17.1	n.a.	2906	3633	4515	4.9	14.0

Table 3: Input on Education

Notes:

ⁱ Pupil-teacher ratio is the average number of pupils per teacher. Data from UNESCO (2024).

ⁱⁱ Government expenditure per student is the average general government expenditure (current, capital, and transfers) per student in the given level of education. Values are calculated by GDP per Capita, PPP multiple by Government expenditure per student as percentage of GDP per capita.

ⁱⁱⁱ General government expenditure on education (current, capital, and transfers).

Table 3 also shows that in CLM, there are lower public expenditure on education and higher pupil-teacher ratio when compared to the world average level. Given this, at least one can expect that additional inputs, in term of either increasing government expenditure or improving teacher's qualification, could improve the quality of education. This is particularly important for CLM countries with low national income and low education expenditure.

3.3 Reducing gender inequality in education

The disparity of education can affect the overall development and economic growth of countries. In ASEAN, the existence of gender equality in education is evident in many aspects. For instance, seven out of ten ASEAN member states have literacy rates higher than 90%. But except in the Philippines, the female literacy rate is generally lower than that of male by at least 3 percentage points. Such gender gap got wider in CLM countries, where the percentage of female illiteracy is around 10 points higher than that of male illiteracy.

As for digital literacy education in schools, UNICEF (2023) states that there is a large divide between ASEAN countries. The perceived quality of digital literacy education at school tends to be only moderate overall especially for CLM. For instance, only a minority of students in Myanmar and Lao PDR learn digital education at school. Overall, there was a considerable share of young people who do not receive digital education at school.

According to UNESCO (2019), There were still over 33 million illiterate population older than 15 years in the region by the end of 2018, almost two-thirds of which were female. (Table 4) Moreover, youth aged between 15 and 24 accounted for almost 10% of the illiterate population. The top priority is to help these 3 million youths get rid of illiteracy, otherwise they will be excluded from the development of the digital economy.

	Literacy rate			Illiterate population older than 15 years		
	Total	Male	Female	Total (million)	M-F ratio	15-24 years (%)
Brunei	96.1	97.4	94.7	0.01	1:1.9	4.0
Cambodia	80.5	86.5	75.0	2.07	1:2.0	12.1
Indonesia	95.4	97.2	93.6	8.72	1:2.3	1.7

Asia's Future Workforce: Shaping Responsive Education and Employment Policies for Youth and Beyond

Lao PDR	84.7	90.0	79.4	0.68	1:2.1	15.6
Malaysia	93.7	96.3	91.1	1.46	1:2.3	9.7
Myanmar	75.6	80.0	71.9	9.30	1:1.5	15.5
Philippines	96.4	96.0	96.8	2.38	1:0.8	15.3
Singapore	97.1	98.7	95.5	0.14	1:3.7	0.4
Thailand	92.9	94.7	91.2	4.02	1:1.8	4.5
Vietnam	93.5	95.8	91.4	4.30	1:2.2	12.0
ASEAN	92.8	94.8	90.9	33.09	1:1.8	9.5

Table 4: Gender Inequality in Literacy

Source: the Author. Raw data from UNCESCO (2019) and <https://datatopics.worldbank.org/world-development-indicators/>

However, urban-rural inequality in education seems to be more significant than that of gender inequality in many ASEAN member states. Table 5 illustrates the differences in educational attainment between urban and rural areas in Cambodia, Indonesia, Lao PDR, Myanmar, the Philippines, Thailand, and Vietnam based on UNESCO's World Inequality Database on Education (WIDE).

	primary complete rata			lower secondary complete rate			upper secondary complete rate		
	Rural	Ur-ban	Over-all	Rural	Ur-ban	Over-all	Rural	Ur-ban	Over-all
Cambodia	74	93	79	38	69	46	17	39	22
Indonesia	95	98	97	81	86	91	50	74	63
Lao PDR	82	96	86	43	77	53	20	55	31
Myanmar	81	89	83	33	70	44	10	32	17
Philippines	91	93	92	78	85	81	74	83	78
Thailand	99	99	99	87	92	89	61	74	68
Viet Nam	98	98	98	85	91	87	46	75	58

Table 5: Urban-rural disparity of education

Source: <https://www.education-inequalities.org/>

First, the primary education completion rates show a noticeable gap between urban and rural areas. For instance, in Cambodia, the completion rate in rural areas is 74%, compared to 93% in urban areas. Similarly, in Lao PDR, the rural completion rate is 82%, while the urban rate is 96%. This trend is consistent across other countries, indicating that children in rural areas are less likely to complete primary education compared to their urban counterparts. Second, the disparity becomes more pronounced at the lower secondary level. In Indonesia, the completion rate for rural areas is 81%, while it is 86% in urban areas. In Myanmar, the gap is even wider, with 33% in rural areas and 70% in urban areas. Third, the inequality is most evident at the upper secondary level. In Cambodia, only 17% of rural students complete upper secondary education, compared to 39% in urban areas. In Lao PDR, the rates are 20% for rural areas and 55% for urban areas. All these significant differences highlight the challenges faced by rural students in continuing their education to a higher level.

Compared to their peers in the cities, ASEAN youth in rural areas face barriers to higher education due to limited education resources, financial constraints, as well as social-cultural factors. For instance, rural areas often have fewer schools, which are also located farther from students' homes, making it difficult for children to attend regularly. Rural schools normally do not have facilities and qualified teachers compared to those in urban areas. Plus, some families in rural areas could be so poor that they have to prioritize work over education, leading to higher youth dropout rates. Moreover, cultural norms and values in some rural communities may not value formal education.

Addressing this disparity requires targeted policies and interventions that focus on improving access to quality education in rural areas. This includes building more schools, training teachers, providing financial support to families, and promoting the importance of education within rural communities. By bridging the educational gap between urban and rural areas, ASEAN countries can ensure more equitable and sustainable development.

4. Increasing Weight of TVET

Digitalization can lead to mass customization. Product/service differentiation and customization will be the key to being competitive in the digital economy. (Chen 2019) This is also true when thinking of developing human resource

and improving their quality. In the digital society, technologies, skills and labour market demands are constantly changing. School education alone may not be able to keep up with the pace of changing demand on labour skills in the market.

In addition to school education, TVET can offer critical tools for ensuring that all individuals have the opportunity to acquire the skills needed for the future of work. Normally, TVET programs are designed to equip individuals with practical skills that are directly applicable to the job market. According to UNESCO and ILO (2001), TVET will play an increased role in human capital development, given its feature of flexibility to adapt new skills to meet the needs from digitalization. The ASEAN emphases on TVET will include (i) increasing awareness of digital technology and digital-enabled models; (ii) developing specific skills to meet the new demand or be more competitive in the market, (iii) (re)building and updates broad based skills, such as the ability of using ICT tools and effective communication, (iv) facilitating entrepreneurship training, and (v) enabling learning to be a lifestyle.

Compared to school education, TVET could be closer to the market. It can respond to the market demand timely, and more importantly, easier to customize in various forms. By tailoring to meet the needs of specific industries, TVET can address the possible mismatch between the skills taught in traditional education systems and can help improve and adapt *"the skills, knowledge and dispositions of those entering the labour force, and also of those who are already active in the labour market."* (UNESCO 2015)

Moreover, TVET supports lifelong learning by offering flexible learning pathways that allow individuals to continuously update their skills. TVET programs can be updated more quickly to incorporate new technologies and practices. These help the workforce remain competitive in a rapidly changing job market, which is particularly important since the future of work is shaped by rapid technological advancements, including automation, artificial intelligence, and digitalization. Table 6 summarizes some types of TVET to be adopted in youth education in ASEAN.

Type of TVET	Description	Benefits to the Future of Work
Formal TVET	Structured programs offered by educational institutions with recognized qualifications or certification.	Ensures standardized skills and knowledge, meeting industry requirements and enhancing employability.
Non-Formal TVET	Short-term courses, workshops, and training programs.	Provides flexibility and quick skill acquisition, crucial for adapting to rapidly changing job markets.
Informal TVET	Learning through work experience, family businesses, or community activities.	Promotes practical skills and local knowledge, supporting entrepreneurship and community development.
Apprenticeships	Combines on-the-job training with classroom instruction, typically via school-industry partnership.	Bridges the gap between theory and practice, ensuring job readiness and reducing skill mismatches.
Online Learning	TVET programs delivered through digital platforms.	Expands access to education, supports lifelong learning, and caters to the needs of a digital economy.
Work-Based Learning	Training programs conducted directly in the workplace, often tailored to specific company needs.	Enhances practical skills and immediate applicability, fostering stronger industry-education linkages.
Sector-Specific TVET	Specialized training programs focused on particular industries with high skill specialization.	Addresses specific skill shortages, ensuring a workforce that meets the demands of key economic sectors.
Community-Based TVET	Programs designed to meet the needs of local communities, often focusing on local industries and crafts.	Supports local economic development and preserves cultural heritage, while providing relevant skills.

Table 6: Variety of TVET

Source: the Author.

5. Concluding Remarks

A well-educated youth population is essential for economic growth and competitiveness. Given that ASEAN member states are facing similar education challenges, collaboration among ASEAN countries is crucial for strengthening youth education by addressing disparities in educational access and quality. For instance, the development of regional educational standards and mutual quality recognition mechanisms will help level up the quality of education and facilitate cross-border labour movement. This helps ASEAN develop and implement inclusive education policies that cater to diverse learning needs.

In this regard, pooling resources facilitate ASEAN countries to develop more comprehensive and effective educational programs that makes education more accessible. In the long term, aligning educational initiatives with broader regional development goals, such as those outlined in the ASEAN Community Vision 2025 and the Digital ASEAN initiative⁵, can lead to shared solutions to ensure young people are equipped with the skills needed for the job market.

Digital literacy is of particular importance for the youth's future as "it helps them to develop other transferable skills and learn better." (UNICEF 2021: 21) Moreover, acquiring digital skills will be useful in preparing for the job market by empowering young workers to perform more challenging tasks such as creating digital content, solving problems effectively and being safe online.

5.1 Leveraging digital technology in learning

There are two policy areas worth particular emphases. One is about policy effort on leveraging technology and digital learning in ASEAN. Digitalization can introduce new tools and solutions to improve the efficiency of each links of education chains. Teachers today could and should be armed with various digital tools to further facilitate knowledge diffusion. It is not unusual that teachers today use ICT to visualize concepts, simulate scenarios, and customize teaching schedules for different groups of students based on their strength and weakness. On

5 The Digital ASEAN initiative was launched by the World Economic Forum in Singapore in April 2018. It contains five task forces, including (i) pan-ASEAN data policy, (ii) optimizing high-quality broadband access for ASEAN, (iii) building a shared commitment to train digital skills for the ASEAN workforce, (iv) a common ASEAN e-payment framework, and (v) nurturing cooperation and capacity building in ASEAN cybersecurity.

the other side, students benefit from using the computer and the internet as a tool for study as well, i.e. using computer to read the text and finish homework, accessing the internet to search for references, and discussing with classmates via social media. As more exercises, assignments and examination go digital, it has become much easier than ever to facilitate teacher-pupil-parent communication as well as information exchange among teachers, students, and parents. Extensively, digitalization can enhance the teachers' capacity to adapt education materials and methods in accordance with students' aptitude and help develop a student's ability for self-discipline and self-teaching.

For instance, developing regional e-learning platforms can provide not only supplements or alternatives to schooling, but also access to quality TVET education, especially in remote and rural areas. Technically, online education platforms can offer courses, certifications, and resources that are accessible to all ASEAN youth regardless of borders. Collaboration on developing and sharing digital training modules can ensure the youth's access to quality education, while online professional development courses for teachers help enhance their skills and adapt to new teaching technologies. Moreover, online platforms provide more efficient ways for young people to voice their opinions and participate in decision-making processes related to education.

However, the effect of online education should not be over-estimated. It is too ambitious to expect that digitalization alone could totally disrupt current education and training patterns and practices. There are various social, cultural, and economic elements that are worth considering. High quality education needs some basic support from (i) effective education chains of teaching-learning-exercising-monitoring-evaluation, (ii) good contents of teaching materials, and (iii) inclusive platform(s) of knowledge integration and distribution. In all aspects, strengthening these fundamentals and digitalization could mutually reinforce each other.

Moreover, it is worth noting that using the internet to access online training resource needs basic infrastructure, such as computer, network connection, software/apps installation, and registration to services. The entry cost of using ICT is not zero, although technology progress has dramatically driven down the cost. One can imagine that it is still quite a burden for schools in CLM to provide their students basic ICT infrastructure to get access to online resources, given that the annual

government expenditure per student is less than 500 USD. Without necessary hardware and software equipment, it seems hard to empower education with ICT.

5.2 Partnership with industry

The other one is about the enhancement of academic-industry collaboration that can help align education with market needs, as the latter can provide input on curriculum development, offer internships, and participate in apprenticeship programs. The public-private partnerships (PPPs) in education encourages private sector companies to bring in additional funding, expertise, and up-to-date innovation to educational programs. As an example, partnership in leadership training programs can empower the youth to take active roles in their communities by offering leadership and entrepreneurship training.

ASEAN has attempted to enhance partnership with major tech companies to develop digital skills for its workforce. For instance, the Digital ASEAN Initiative (DAI) planned to bring together digital giants such as Cisco, Google, Grab, Microsoft, Lazada, SEA Group, and Tokopedia for a collaboration to train 20 million people in Southeast Asia by 2020, especially those working in small- and medium-size enterprises (SMEs). Although ASEAN is said to be brimming with entrepreneurial potential, but for SMEs to start businesses and grow them successfully in the digital era, they'll need to learn the right skills and own the right tools. Under the DAI framework, Google pledged to train 3 million SME employees, while Cisco, Lazada, Microsoft, and the Sea Group pledged to train another 5.6 million SME workers. These companies also promised to offer internship opportunities for ASEAN university students, as well as initiatives to train digital regulators and shape the curricula of technology and computing courses at 20 ASEAN universities. They invited students and the public to visit their offices and learn more about the character of the jobs of the future.

5.3 Regional cooperation on education

Finally, from a regional perspective, creating inter-operable educational standards and frameworks across ASEAN countries to ensure consistency in quality and content is necessary. For example, the application of the ASEAN Qualifications Reference Framework (AQRF) motivates ASEAN countries to work together to align their TVET qualifications with the

AQRF and promote mutual recognition of skills and certifications so that workers' skills are transferable between countries. Other regional efforts, such as promoting mobility and exchange programs for students and teachers⁶, organizing regional competition⁷, and awarding joint research among ASEAN universities to address regional educational challenges, will also help improve ASEAN youth development. Moving forward, regional collaboration to create a more cohesive, resilient, and high-quality education system for youth development is essential for ASEAN to ensure that its workforce is well-prepared for the future of work, driving economic growth and social development. Indeed, just as the ASEAN Charter has declared, one of the ultimate goals of ASEAN community building is *"to develop human resources through closer cooperation in education and lifelong learning, and in science and technology, for the empowerment of the peoples of ASEAN and for the strengthening of the ASEAN Community"*. (ASEAN: ASEAN Charter, Article 1).

Dr. Lurong Chen is Senior Economist at Economic Research Institute for ASEAN and East Asia (ERIA). He received his Ph.D. in International Economics from the Graduate Institute of International Studies, Geneva.

Dr Chen's expertise is in digital economy, global value chains, free trade agreements, and Asian regionalism. He provides consultation on policy issues related to digitalization, trade and investment liberalization and East Asian economy.

His recent publications include Intellectual Property Rights and ASEAN Development in the Digital Age published by Routledge, Accelerating Digital Transformation in Indonesia: Technology, Market and Policy published by ERIA, and ERIA policy paper The Indo-Pacific Partnership and Digital Trade Rule-settings: Policy Proposals.

6 Education exchanging program can enhance skills, expose participants to different teaching methodologies and learning environments, enhance cultural understanding, and foster regional integration.

7 Organizing competitions can motivate students and institutions to strive for excellence and innovation.

References

- ASEAN (n.d.) the ASEAN Charter, available at <https://asean.org/wp-content/uploads/images/archive/publications/ASEAN-Charter.pdf>
- ASEAN (n.d.) Youth, <https://asean.org/our-communities/asean-social-culture-community/education-youth/>
- Chen, L. (2019), 'ASEAN in the Digital Era: Enabling Cross-border E-commerce', in L. Chen and F. Kimura (eds.), *Developing the Digital Economy in ASEAN*. New York: Routledge, pp. 259-275.
- ILO (2024), Statistics on labour productivity, available at <https://ilostat ilo.org/topics/labour-productivity/>
- OECD (), OECD's Programme for International Student Assessment (PISA) survey, available at <https://www.oecd.org/en/about/programmes/pisa.html>
- The Commonwealth (2024), Global Youth Development Index Update Report 2023, available at <https://thecommonwealth.org/publications/global-youth-development-index-update-report-2023>
- UNDP (2024), Human Development Reports, available at <https://hdr.undp.org/>
- UNESCO (2015), Recommendation concerning Technical and Vocational Education and Training (TVET), available at <https://unesdoc.unesco.org/ark:/48223/pf0000245178>
- UNESCO (2019), Global Education Monitoring Report 2019, available at <https://gem-report-2019.unesco.org/>
- UNESCO (2024), Education for sustainable development, available at <https://www.unesco.org/en/sustainable-development/education>
- UNESCO and ILO (2001) Revised Recommendation concerning Technical and Vocational Education, available at <https://unesdoc.unesco.org/ark:/48223/pf0000153950?posInSet=27&queryId=b885881c-33a6-4acb-a438-348e4345daa2>
- UNICEF (2023), Bridging the Gender Digital Divide, available at <https://data.unicef.org/resources/ictgenderdivide/>
- WIPO (2023), Global Innovation Index, available at <https://www.wipo.int/en/web/global-innovation-index>
- World Bank (2024) World Development Indicators, available at <https://datatopics.worldbank.org/world-development-indicators/>

Building a Resilient and Inclusive Future: Strengthening Indonesia's Education System to Prepare the Next Generation to Tackle Global Challenges

Julia Novrita

Abstract

This chapter explores the evolving educational landscape in Indonesia, highlighting the significant transformations influenced by historical, political, and economic factors. While strides have been made in improving access and quality, persistent inequities and challenges remain. The dual nature of education—as both a tool for empowerment and a mechanism for perpetuating existing power structures—necessitates a critical reassessment of educational goals and practices. This study emphasizes the need for an education system that not only equips students with technical skills but also fosters critical consciousness, ethical reasoning, and active citizenship. By integrating civic engagement, environmental stewardship, and ethical decision-making into the curriculum, schools can empower students to address pressing social and environmental challenges. The article concludes with a series of recommendations aimed at building a more resilient, inclusive, and equitable education system in Indonesia. These recommendations focus on enhancing access, improving quality, promoting inclusivity, and fostering holistic development, ensuring that education serves as a catalyst for social transformation and sustainable development. Ultimately, this approach aims to prepare a generation capable of critically engaging with the multifaceted challenges of contemporary society, thereby contributing to economic growth, social equity, and environmental sustainability.

Introduction

The world and the Earth we inhabit are facing increasingly pressing challenges. The alarming rise in global temperatures, exacerbated by relentless exploitation of natural resources, looms large over our future (see IPCC, 2021). Despite ongoing discussions and commitments made at various forums, tangible actions remain elusive. Each meeting yields promises, yet the outcomes continue to fall short of expectations. Our planet is heating up, and exploitation persists, driven by a classical economic framework that upholds capitalist values—values that prioritize economic growth for a privileged few, often at the expense of the environment and society.

In this context, the competitive nature of capitalism, which fosters technological innovation, paradoxically emphasizes the exploitation of nature and efficiency in a race to meet market demands. It is no surprise that many innovations tend to create more harm than good, prioritizing immediate gains over sustainable benefits for humanity and the environment. Moreover, the disruptive impact of technology has reshaped democracy by democratizing information access and enabling new forms of political engagement, while also facilitating the spread of misinformation and creating echo chambers that deepen societal divides. Populist leaders leverage social media to communicate directly with supporters, often amplifying grievances and economic discontent. We witness the emergence of populist leaders who engage in transactional politics, further disempowering the populace while consolidating their authority. Their increased surveillance capabilities pose threats to democratic freedoms. This authoritarian approach often protects exploitative business practices, perpetuating a cycle of inequality and environmental degradation.

Just as technology presents both opportunities and challenges, the education sector embodies a similar duality. While education has long been viewed as a beacon of hope for solving various societal issues, this optimism can sometimes be overly idealistic. In reality, education serves two distinct roles: it can be a tool for ruling powers to uphold their authority, and on another side, fostering resistance against oppressive regimes. This duality highlights that educational agendas are not value-neutral. The historical evolution of education in Indonesia, which will be discussed later, serves as a compelling example of this complexity.

Critical Competencies for 21st Century

In his seminal work *Pedagogy of the Oppressed*, Paulo Freire critiques traditional education systems for their tendency to reinforce existing power structures

rather than challenge them. This observation raises a crucial question: when we discuss competencies for 21st century, for whom are we actually preparing our youth? Whose values are we promoting? Are we training them to become mere workers or laborers for industries that have historically—and continue to—engage in exploitative practices? Or are we equipping them with competencies that empower them to transform these detrimental practices and take the lead in addressing pressing environmental issues, promoting democracy, and fostering social cohesion? If our goal is the latter, it becomes imperative to shift our focus from merely imparting technical skills to instilling foundational values that will guide young people in making informed and ethical decisions in the future.

This aligns with the educational values developed by Paulo Freire, who emphasizes the importance of critical consciousness and the role of education in empowering individuals to challenge oppression and advocate for social justice. John Dewey, in his book, *Democracy and Education*, also advocates for democratic values and active citizenship, highlighting education's crucial role in preparing individuals for social participation. He believed education should not only impart knowledge but also foster a sense of responsibility and engagement in democratic processes.

Later authors such as Noddings (1992), Lickona (1992), Peck (1998), also emphasize the importance of value development in education. Noddings proposes a realignment that rewards not just rationality but also moral sensitivity, focusing on care ethics and empathy. Lickona stresses the need for character education, highlighting values like respect, responsibility, and fairness, which are essential for ethical individuals navigating complex social interactions. Lastly, Peck emphasizes spiritual survival and the principles of love and tolerance to build a society committed to collective action and change, advocating for a community-oriented educational approach. These thinkers highlight the vital role of values-based education in fostering a just and equitable society, preparing students for both academic success and meaningful engagement with the world. This holistic approach recognizes that developing character and ethical reasoning is as crucial as acquiring knowledge and skills, ultimately cultivating a generation of leaders equipped to address the complex challenges of our time.

Once these values are established, the next essential skill is communication. This skill helps them convey their vision for change—the ideal situation they aspire to achieve. Effective communication will be vital in articulating their agendas and mobilizing others to join them in their efforts for transformation. As noted by Marshall McLuhan (2013) in *Understanding Media: The Extensions of Man*, the medium through which we communicate shapes our message and,

ultimately, our impact. Hence, young leaders must harness both traditional and digital communication tools to effectively share their vision and engage their communities. Moreover, the ability to communicate effectively in diverse contexts is supported by the work of Edward Said in *Culture and Imperialism* (1993), which emphasizes the importance of understanding cultural narratives and perspectives when advocating for change. This cultural competence will enable youth to navigate complex socio-political landscapes and foster inclusive dialogues.

In conclusion, to empower the younger generation, educational leaders must serve as role models by prioritizing values and ethics, promoting a transformational leadership style that integrates ethical decision-making (Fullan, 2001). Education should evolve to equip youth not only with technical skills but also with the values and communication abilities needed to challenge existing power structures and advocate for a more equitable and sustainable future, ultimately shaping a generation ready to lead transformative change.

Education System in Indonesia

What is the state of education in Indonesia? To whom does it cater? Is the Indonesian education system equipped to prepare its youth to tackle diverse challenges, or is it primarily aimed at creating workers who fulfil the agendas of the elite by adhering to set directives? More importantly, does it prioritize the development of technical skills at the expense of critical thinking, emotional intelligence, and effective communication, ultimately neglecting to nurture individuals capable of leading themselves?

This section will begin by exploring the historical origins of education in Indonesia to understand the various changes that have occurred over time. This exploration reveals the significant contributions of educational agendas and the values that have been integrated into the educational landscape. Understanding this history is crucial for appreciating how past influences continue to shape contemporary education in Indonesia and inform ongoing reforms and practices. This way, we can better assess the current state of education and its ability to equip the younger generation with the skills and values necessary for meaningful participation in society. Before we delve into the history of education development in Indonesia, here is a brief context of the country.

- **Brief Context of Indonesia**

Indonesia is the world's largest archipelagic state with over 17,500 islands,

700 distinct ethnic and linguistic groups and more than 81,000 kilometres of coastline, spans three time zones from the west to the east. It is home to a diverse geography and a population of over 273 million in 2020, making it the fourth most populous nation. The majority are Muslim (87 percent), almost 10 percent are Christian, and the rest include Hindus, Buddhists, Confucianists, and members of other faiths.

While the manufacturing sector significantly contributes to the GDP and recent economic growth has halved the poverty rate from 24% in 1999 to 9.78% in 2020, Indonesia remains highly vulnerable to climate change (World Bank, 2021). It ranks in the top third globally for climate risk, facing severe threats from flooding, extreme heat, and sea-level rise. Without effective adaptation, an additional 1.4 million people could be exposed to extreme river flooding by 2035–2044, and over 4.2 million may face permanent flooding by 2070–2100 (Climate Risk Profile: Indonesia, 2021).

Historically, Indonesia has been renowned for its rich and diverse spices, which attracted numerous traders and colonial powers from around the world. The archipelago's unique geographic position along vital trade routes made it a hub for commerce, drawing merchants from as far as Europe, the Middle East, and Asia. Spices such as nutmeg, cloves, and pepper were highly sought after, often fetching exorbitant prices in international markets. This lucrative trade not only fuelled economic growth but also led to the establishment of colonial rule as various powers sought to control these valuable resources. And education served as a tool to spread their ideologies and maintaining power.

- **The Development of Education in Indonesia**

The historical study of education in Indonesia highlights that its development is closely linked to the prevailing cultures of each era. Before the arrival of Europeans, Indonesian education was influenced primarily by Hindu-Buddhist and Islamic traditions. During the Hindu-Buddhist period, education evolved in accordance with these cultural teachings. With the introduction of Islam, educational practices adapted to align with Islamic teachings and the mission of spreading the faith among the populace. Drawing from various sources, the table below summarizes the development of education in Indonesia over time, starting from the European colonial era.

Asia's Future Workforce: Shaping Responsive Education and Employment Policies for Youth and Beyond

PERIOD	KEY EVENTS AND DEVELOPMENT
Colonial Era Education (1600-1945)	<p>a. Portuguese and Spanish Schools: Established to support trade missions and promote Catholicism.</p> <p>b. Dutch Educational Transformation: Promoted Protestant Christianity and loyalty to colonial authorities; Introduced reading, writing, and community-building; Replaced local languages with Malay and Dutch; Established primary and secondary schools for European children and privileged indigenous populations; Developed vocational training to support military logistics and infrastructure; Trained teachers and doctors, solidifying Dutch control.</p> <p>c. Indigenous Resistance and Educational Movements</p> <ul style="list-style-type: none"> • Indigenous Aristocracy Awareness: Led to resistance movements aiming for societal reform in response to discrimination in the Dutch education system. • Notable Educational Movements: <ul style="list-style-type: none"> <i>Budi Utomo:</i> Promoted nationalism, language, culture, arts, and Indonesian literature. <i>Taman Siswa:</i> Operated independently, emphasizing Indonesian cultural values with a non-discriminatory structure. • Growth of schools founded by traditionalist and modernist Muslim figures (e.g., Muhammadiyah, Nahdlatul Ulama).
Japanese Occupation Education (1942-1945)	<p>a. Strategic Educational Goals: Cultivated a workforce to support Japan's war efforts.</p> <p>b. Restructured Educational Framework: Introduced "<i>Sekolah Rakyat</i>" (People's Schools) with six years of basic education, followed by junior and senior high; Established vocational schools and teacher training programs.</p> <p>c. Language Policy: Indonesian became the primary medium of instruction; Dutch teaching was prohibited; Japanese was the only foreign language allowed, with local languages permitted until proficiency in Indonesian was achieved.</p>

<p>Post-Independence Education Framework under Soekarno Leadership (1945-1967)</p>	<ul style="list-style-type: none"> a. Constitutional Governance: Article 31 of the 1945 Constitution guarantees the right to education and mandates the establishment of a national education system. b. Focus on National Identity: Emphasized patriotism and national identity in education, guided by Ki Hajar Dewantara's motto, the father of Indonesian education. c. International Exposure: Teachers sent abroad to teach; youth encouraged to study internationally and return to apply knowledge.
<p>Economic and Policy Alignment under Soeharto Leadership (1967-1998)</p>	<ul style="list-style-type: none"> a. World Bank Directives: Education aligned with economic growth agendas, training students as workers while exploiting their intellect for those in power. b. Standardized Testing: Introduction of standardized testing (EBTANAS or the National Final Learning Standardized Testing Evaluation and UMPTN or State University Entrance Examination) and literacy campaigns; c. Compulsory Education: Nine-year compulsory education mandated, with schools established in remote areas. d. Authoritarian Policies: Initially stifled academic freedom.
<p>Decentralization and Autonomy under Habibie (1998-1999) and Wahid (1999 - 2001) leaderships</p>	<ul style="list-style-type: none"> a. Decentralization Policies: Allowed regional autonomy in education, promoting local governance and accountability b. Restoration of Academic Freedom: Abolished regulations hindering creativity and student freedom.
<p>Constitutional Amendments and Budget Allocation under Megawati (2001-2004) and Yudhoyono (2004-2014) leaderships</p>	<ul style="list-style-type: none"> a. Expanded Article 31, Emphasized: Six-year compulsory education funded by the government; National education system fostering faith, piety, and noble character; At least 20% of national and regional budgets allocated to education; Promotion of science and technology alongside religious values.

	<p>b. 20% Budget Allocation: Led to reforms such as School Operational Assistance (BOS) program; Teacher certification programs to enhance income standards; Scholarships to improve competencies.</p> <p>c. Expansion of Compulsory Education: Focused on equal access to nine-year education.</p>
<p>Kampus Merdeka (Independent Learning) Policy under Joko Widodo leadership (2014-2024)</p>	<p>a. Key Programs for Basic and Secondary Education</p> <ul style="list-style-type: none"> • National Standard School Examination (USBN): Conducted by schools starting in 2020; Assessed student competencies through diverse formats; Funds can be redirected to improve teacher and school capacities. • National Exam (UN): Held for the last time in 2020; Transitioned to Minimum Competency Assessment and Character Survey in 2021; Evaluates literacy, numeracy, and character education, aligning with international assessments like PISA and TIMSS. • Lesson Plan (RPP): Simplified preparation process, allowing teachers to create their formats for efficiency. • Student Admission Regulations (PPDB): Flexible zoning system to address regional disparities; Local authorities determine quotas and proportions; Encourages collaboration between local and central governments for equitable access. • School Operational Assistance (BOS) Funds: Direct allocation to school accounts; Increased amounts and online reporting for transparency and accountability. • Mover School and Mover Organization Program: Enhanced quality of teachers, school principals, and staff; Provided support for transforming schools into "Mover Schools; Focused on Pancasila Student Profile: faith, moral character, global diversity, teamwork, creativity, critical thinking, and independence.

	<ul style="list-style-type: none"> • Mover Teacher Program: Emphasizes leadership development and teacher autonomy in career growth. <p>b. Vocational Schools (SMK)</p> <ul style="list-style-type: none"> • Center of Excellence Program: Aimed to create outstanding SMKs that meet industry standards; Priority sectors include creative economy, machinery, hospitality, nursing, maritime, agriculture, and international co-operation; Curriculum developed by industry practitioners with project-based learning; Minimum one semester of industry internship required; Adequate standards and competency certifications, with regular technology updates for teachers. <p>c. Higher Education Policies</p> <ul style="list-style-type: none"> • New Study Programs: Opened based on labor market needs, especially for A and B accredited universities collaborating with world-class organizations. • Voluntary Accreditation: Focused on universities seeking accreditation through industry and professional associations, not government mandates. • Legal 'Autonomy' Entity Status for State Universities: Encouraged with simplified requirements, maintaining subsidies (currently 11 universities have this status). • Flexible Study Options: Students can study for three semesters outside their program and campus. • Budget and Performance Indicators: Increased Budget allocation based on eight Key Performance Indicators (KPIs): Graduates securing decent jobs; Students gaining external experiences; Faculty engaging in off-campus activities; Practitioners teaching on campus; Faculty work recognized internationally; Study programs collaborating with world-class partners; Curriculum quality improvements; Enhanced educational outcomes.
--	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Table 1: Summary of Education Development in Indonesia

Building a Resilient and Inclusive Future: What are the Gaps?

Examining Indonesia's educational evolution reveals that agendas are often shaped by those in power, primarily benefiting the ruling elite. During the Dutch colonial period, an exclusive and discriminatory education system emerged, which was briefly transformed under Japanese occupation, when they abolished this framework to support their war efforts. In the early years of independence, Ki Hajar Dewantara, the first Minister of Education, established a philosophy that emphasized nationalism, religious values, and cultural heritage, encapsulated in his motto promoting leadership and empowerment. However, during Suharto's regime, foreign influence through aid from institutions like the World Bank prioritized economic growth over human dignity, training students to serve the interests of the elite.

The SD INPRES initiative aimed to build schools in remote areas, improving educational access and outcomes (Duflo, 2001). However, rampant corruption and nepotism during Suharto's presidency, exacerbated by the Asian financial crisis, undermined democratic values and citizen agency. Decentralization reforms under Habibie and Wahid allowed for localized educational strategies, while increased female participation during Megawati and Yudhoyono's administrations highlighted the importance of women's education for economic development.

As shown in the table above, Widodo's leadership had focused on vocational education aligned with industry demands and technology integration. However, these policies have been criticized for being overly technical, echoing past neglect of philosophical foundations in education. Corruption remains a significant issue, with the Indonesian Corruption Watch (2021) reporting 240 cases from 2016 to 2021, resulting in substantial state losses. Most suspects include civil servants and officials linked to various educational funds, highlighting ongoing governance challenges in the sector.

Learning from the various dynamics of educational development in Indonesia, the new leadership under Prabowo Subianto (2024–2029) brings hope for reform. Below are several gaps that were identified, which need to be addressed to build a resilient and inclusive future:

- a. **Equity in Access to Education:** The historical impact of colonial and post-colonial education systems has created persistent inequities, favoring certain groups over others. Despite recent initiatives like the flexible zoning system, significant disparities in access to quality education continue to exist, particularly in remote and underserved regions. The "campus merdeka"

policy fails to adequately address the unique needs of these diverse areas, revealing a lack of tailored approaches to ensure equitable access to educational resources.

- b. **Quality of Education:** Teachers often lack sufficient opportunities for professional development and support, which hinders the overall quality of education. While programs like the Mover Teacher Program have been introduced, there are still considerable gaps in ongoing training, especially in rural settings. Many educators do not have access to modern resources or training that align with contemporary pedagogical practices, leaving them ill-equipped to meet the demands of a rapidly changing job market.
- c. **Inclusivity in Education:** Indonesia's education system has historically marginalized the country's rich cultural and linguistic diversity. Although there are efforts to promote Indonesian cultural values, the curriculum still inadequately incorporates diverse cultural perspectives and languages, failing to reflect the nation's full heritage.
- d. **Student-Centered Learning:** The shift from standardized exams to competency-based assessments has potential benefits, yet there remains a risk of continuing to prioritize testing over holistic student development. Furthermore, the experiences and voices of students are frequently overlooked in educational policymaking, limiting their involvement in shaping their own educational journeys.
- e. **Sustainability and Resources:** Despite increased budget allocations for education, there are ongoing challenges related to consistent funding and resource distribution across all educational levels. Many rural schools continue to face inadequate infrastructure, which hampers their ability to provide effective vocational training and practical learning opportunities.
- f. **Integration of Technology:** The COVID-19 pandemic has underscored the significant digital divide within the education sector. A considerable number of students lack access to essential technology and internet connectivity, which severely limits their ability to participate in remote learning. Additionally, while there is a growing trend toward technology integration, many teachers do not receive adequate training to effectively utilize digital tools in their classrooms.
- g. **Holistic Development Focus:** Although current policies emphasize the importance of character education, there is a lack of structured approaches to fostering essential soft skills such as teamwork, creativity, and critical

thinking within the curriculum. Moreover, the emphasis on academic performance often overshadows the equally important aspects of mental health and well-being for students.

In summary, these gaps highlight critical issues within Indonesia's education system that require urgent attention. The persistence of inequities, inadequate teacher support, insufficient inclusivity, and the challenges of technology integration collectively hinder the potential for a robust educational framework. Addressing these gaps is essential for creating an education system that not only meets the diverse needs of all students but also prepares them for the complexities of the modern world. Without significant improvements in these areas, the vision for a more equitable, high-quality, and inclusive education will remain unattainable.

Conclusion and Recommendations

In addressing the pressing challenges faced by the world today, it is evident that the education system in Indonesia must evolve to meet the needs of a rapidly changing society. The historical context reveals that educational agendas have often been shaped by those in power, leading to inequities that persist in contemporary times. While recent reforms have aimed to enhance access and quality, significant gaps remain, particularly in ensuring that education is inclusive, equitable, and aligned with the values necessary for fostering critical consciousness, active citizenship, and a spirit of nation-building. Additionally, empowering women through education is crucial, as their leadership and participation are vital for social and economic development. As the nation looks to the future under new leadership, the need for a comprehensive approach that prioritizes ethical decision-making, sustainable practices, and the empowerment of youth becomes increasingly urgent.

To bridge these gaps and build a resilient and inclusive future, several key recommendations must be implemented. First, policies should focus on ensuring **equitable access** to education across all regions, particularly in underserved areas, while promoting **women's leadership** initiatives to empower female students and encourage their active participation in society. Second, there is a pressing need to enhance the **quality of education** through ongoing professional development for teachers and the creation of **a dynamic curriculum** responsive to the evolving job market and nation-building goals. Third, the education system must embrace **inclusivity** by integrating diverse cultural perspectives and languages into the curriculum, reflecting Indonesia's rich heritage. Fourth, a **student-centered learning** approach should be adopted, emphasizing formative

assessments and the incorporation of student voices in policymaking to foster a sense of ownership and responsibility. Finally, consistent **sustainability** and **resource allocation** must be ensured to support infrastructure development and **technology integration**, addressing the digital divide and preparing students for future challenges. By addressing these recommendations, Indonesia can cultivate a generation of leaders equipped to champion social justice, environmental sustainability, and democratic participation, ultimately fostering a spirit of nation-building for a brighter future.

Julia Novrita has more than 20 years of experience working in the areas of education, peacebuilding, environment, and community development. She has been working as consultant, trainer, facilitator, mentor, researcher for various programs in low resource contexts and conflict affected regions. She is an advocate of social justice, social cohesion, and ecofriendly approach in development interventions as the condition for sustainability. She holds a Ph.D in International Education and Development from the University of Massachusetts, Amherst, USA. She completed her master's degree in Intercultural Service, Leadership and Management at the School for International Training, Vermont, USA, with scholarship from the Ford Foundation. Her bachelor's degree is in Economic Management from the Syiah Kuala University, Aceh, Indonesia. She is currently the Director of Program and Development at The Habibie Center.

References

- Azizah, H. D., Alam, B.H, & Nursyaban, A. (2024). Sejarah Pendidikan di Indonesia Dari Masa Prasejarah Hingga Awal Kemerdekaan. *Gudang Jurnal Multidisiplin Ilmu*, 2(5), 2418–224. Retrieved from: <https://gudangjurnal.com/index.php/gjmi/article/view/458>
- Climate Risk Profile: Indonesia (2021) The World Bank Group and Asian Development Bank. Retrieved from: <https://www.adb.org/sites/default/files/publication/700411/climate-risk-country-profile-indonesia.pdf>
- Datumula, S. (2020). Peraturan Kebijakan Pendidikan Di Indonesia Pada Masa Orde Lama, Orde Baru, Reformasi, Dan Kabinet Kerja. *Moderasi: Jurnal Studi Ilmu Pengetahuan Sosial*, 1(2), 56–78. Retrieved from: <https://moderasi.org/index.php/moderasi/article/view/27/24>
- Dewey, J. (2011). *Democracy and Education*. Simon & Brown.
- Duflo, E. (2001). Schooling and Labor Market Consequences of School Construction in Indonesia: Evidence from an Unusual Policy Experiment. *The American Economic Review*, 91(4), 795–813. <http://www.jstor.org/stable/2677813>
- Freire, P. (2000). *Pedagogy of the oppressed* (M. B. Ramos, Trans.; 30th anniversary ed.). The Continuum. (Original work published 1970)
- Fullan, M. (2001). *Leading in a culture of change*. Jossey-Bass.
- IPCC, 2021: *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, In press, doi:10.1017/9781009157896.
- Indonesia Corruption Watch. (2021). *Tren penindakan korupsi sektor pendidikan: Pendidikan di tengah kepuangan korupsi*. Retrieved from: <https://antikorupsi.org/sites/default/files/dokumen/2021%20ICW%20-%20Tren%20Penindakan%20Korupsi%20Sektor%20Pendidikan.pdf>
- Lickona, T. (1992). *Educating for Character: How our schools can teach respect and responsibility*. New York: Bantam Books

Makmur, Djohan, Pius Suryo Haryono, Sukri Musa, and Hadi S. Sejarah Pendidikan Di Indonesia Zaman Penjajahan. Jakarta: Departemen Pendidikan dan Kebudayaan, 1993.

McLuhan, M. (2013). *Understanding media: the extensions of man* (W. T. Gordon, Ed.). Gingko Press. <http://public.ebib.com/choice/publicfullrecord.aspx?p=1222206>

Noddings, N. (1992) *The Challenge to Care in Schools*. Teachers College Press, New York.

Peck, D. (1998). *Teaching Culture: Beyond Language*. Yale: New Haven Teachers Institute Press.

Said, E. W. (1993). *Culture and imperialism* (1st Vintage books edition). Vintage Books.

Sirozi, M. (2004). Secular–religious debates on the Indonesian National Education System: colonial legacy and a search for national identity in education. *Intercultural Education*, 15(2), 123-137. <https://doi.org/10.1080/1467598042000224998>

Wierna Aulia, R. (2021). Teachers' Perception on The New Policy Called Merdeka Belajar; A Page of Lesson Plan. *FIKROTUNA: Jurnal Pendidikan Dan Manajemen Islam*, 10(02), 1967–1980. <https://doi.org/10.32806/jf.v14i02.5194>

Future-Ready Education: Integrating Higher Order Thinking Skills in Malaysia

Kirjane Ngu

Abstract

In the face of rapid technological and economic change in the 21st century, education systems, including Malaysia's, must prioritise the development of higher-order thinking skills (HOTS) to prepare students for future job market demands and global competitiveness. This chapter evaluates the integration and effectiveness of HOTS within Malaysia's primary and secondary education system, assessing progress, identifying challenges at the student, teacher, and institutional levels, and providing recommendations for improvement. Despite having a comprehensive implementation framework for HOTS, including pedagogy, assessment, and curriculum, Malaysia faces significant obstacles that prevent these efforts from translating into tangible learning and labour market outcomes. The chapter highlights the crucial need for investments in foundational skills and enhancements in teacher quality to achieve successful HOTS implementation.

Introduction

The 21st century is characterised by rapid technological progress and significant industrial shifts in the global economy, making it imperative for the youth to be well-prepared for future job markets. As globalisation and technological advancements accelerate, they introduce transformative changes to various aspects of work, increasing competition for labour across geographic boundaries. Organisations are seeking new skills from the workforce, posing a significant challenge for education systems worldwide, including in Malaysia, to provide continuous and relevant training.

The World Economic Forum's 2020 "Future of Jobs Report" highlights this challenge, predicting that half of all employees will require some degree of reskilling by 2025 (World Economic Forum, 2020). In response, many countries, including Malaysia, are focusing on developing future-ready skills within their educational framework to ensure students can thrive in a dynamic world.

Higher-order thinking skills (HOTS)—encompassing critical, logical, reflective, metacognitive, and creative thinking—are essential for success in the 21st-century workforce (Sukla & Dungsungneon, 2016). These skills involve analysing and evaluating information and applying knowledge in novel contexts, which are vital for maintaining a competitive edge in the global economy.

However, Malaysia's education system faces challenges in integrating HOTS effectively. International assessments like the Programme for International Student Assessment (PISA) reveal that Malaysian students often struggle with these skills, and feedback from employers indicates a gap in the soft skills that graduates need.

Given that primary and secondary education covers the vast majority of young Malaysians and plays a pivotal role in early skill development, focusing on these educational stages is essential for preparing students for future careers. By targeting these foundational levels, Malaysia can impact a significant portion of students and lay the groundwork for their future workforce readiness.

Since 2013, Malaysia has been working to transform its education system through the Malaysian Education Blueprint (2013-2025), which highlights HOTS and character building as crucial elements. The blueprint outlines a strategy involving curriculum development, pedagogy, assessment, co-curricular activities, community support, capacity building, and resources to enhance HOTS.

This chapter examines the integration of Higher-Order Thinking Skills (HOTS) within Malaysia's primary and secondary education system. It begins with an overview of the Malaysian Education System and proceeds to review policies and programs designed to foster HOTS in schools. The chapter assesses Malaysia's progress since the introduction of HOTS, using trends from international assessments as a benchmark. It highlights the challenges faced at the student, teacher, and institutional levels in implementing HOTS effectively. Finally, it offers recommendations for enhancing HOTS implementation, emphasising its role as a crucial foundation for equipping youth for the future.

The Malaysian Education System: An Overview

Malaysia, categorized as an upper-middle-income country with a Gross National Income (GNI) per capita of USD 11,780 in 2023, has a diverse economy largely driven by the services and manufacturing sectors (World Bank, 2023). These sectors collectively contribute approximately 80% to the nation's Gross Domestic Product (GDP), with services accounting for around 58% and manufacturing around 22% (Department of Statistics Malaysia, 2024). As Malaysia is on a

trajectory to becoming a high-income nation, it demands a workforce equipped with the skills necessary to thrive in a rapidly evolving economy. Education is pivotal in this economic transformation, serving as the foundation for enhancing the skill levels within the labour force.

Reflecting its importance, the Ministry of Education (MoE) has consistently received one of the largest shares of the federal budget, ranging from 14% to 19% over the past five years, underscoring the government's commitment to prioritising education as a key component of its economic development strategy.

In Malaysia, education services are managed by two primary ministries: the MoE and the Ministry of Higher Education (MoHE). As of 2020, approximately 7.3 million students were enrolled in formal education across all levels (UNESCO Institute of Statistics, 2020). Formal education in Malaysia encompasses childcare and preschool, followed by primary, lower secondary, upper secondary, post-secondary, and tertiary education.

The MoE provides free primary and secondary education for all Malaysians, while post-secondary and tertiary education in public institutions is significantly subsidised. At the primary and secondary levels, the MoE is the largest provider, with MoE schools accounting for 97% of primary and 88% of secondary enrolments. The Compulsory Education Act 2003 mandates that all children complete six years of primary education, although secondary education is not yet compulsory. This, combined with the affordability of education, has enabled Malaysia to achieve near-universal access to primary and lower secondary education, with Gross Enrolment Rates (GER) of 98.2% and 95.3%, respectively. The GER for upper secondary education was slightly lower at 88.0% in 2020. These high enrolment rates reflect Malaysia's strong commitment to providing widespread access to education.

Enhancing Higher Order Thinking Skills in Malaysia's Education System for the Future

Malaysia, despite making significant strides toward achieving near-universal access to primary and secondary education, still faces challenges in developing students' higher-order thinking skills, which are crucial for the future readiness of its youth. After Malaysia's underwhelming performance in the 2009 PISA assessment (see Figure 1), the country recognised the urgent need to reform its education system to place a stronger emphasis on cultivating these skills. In response, the MoE launched the Malaysia Education Blueprint (2013-2025), which outlines the nation's vision and strategies for elevating educational standards

to meet international benchmarks and better prepare Malaysia's youth for the demands of the 21st century.

Country Comparison of PISA performance in 2009

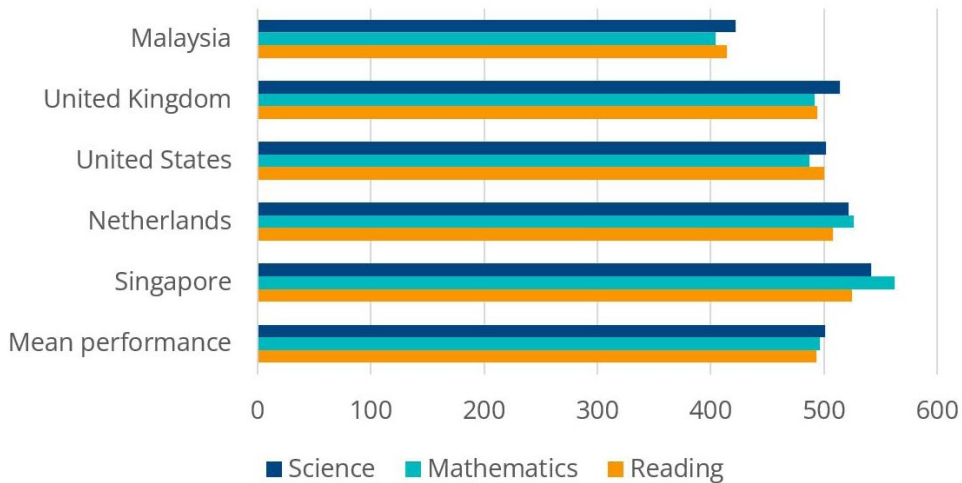


Figure 1: Malaysia's PISA performance in 2009, as compared to high income countries globally and within the region such as Singapore, as well as the OECD average (OECD, 2009¹)

Globally, education systems are increasingly focusing on the development of HOTS as a foundation for lifelong learning, problem-solving, and critical and analytical thinking—skills that are essential for the next generation to adapt to a rapidly changing world. HOTS enable students not only to grasp concepts but also to apply their knowledge to solve new problems in various contexts (Barbara & Waugh, 2009). Historically, like many other education systems worldwide, Malaysia's curriculum has emphasised the acquisition of strong content knowledge in subjects such as Science, Mathematics, and languages. However, there is growing recognition that to ensure future readiness, it is no longer sufficient for students to excel only in the basics of reading, writing, and arithmetic. The focus must also include the development of higher-order thinking skills, a priority clearly articulated in the Malaysia Education Blueprint (2013-2025).

1 Adapted from OECD, PISA 2009 Database.

The MoE has established a framework of seven key components to integrate HOTS into Malaysia's education system. The three core elements—curriculum, pedagogy, and assessment—are complemented by supporting components such as co-curricular activities, community and private sector involvement, capacity building, and resource management².

To enhance the development of HOTS, the MoE revised the national curriculum, introducing the *Kurikulum Standard Sekolah Rendah (KSSR)* or the Primary School Standard Curriculum for primary schools and the *Kurikulum Standard Sekolah Menengah (KSSM)* or the Secondary School Standard Curriculum for secondary schools. These updated curricula are designed to encourage critical thinking and problem-solving from an early age, embedding HOTS into the learning process across all subjects (Ministry of Education Malaysia, 2013).

In the realm of pedagogy, significant efforts have been made to equip teachers with the tools and strategies necessary to foster higher-level cognitive skills in students. One notable initiative is the i-THINK program, launched in 2012, which was inspired by The Thinking Schools International model from the United Kingdom. The i-THINK program offers practical methods for integrating advanced thinking skills into everyday teaching (see Box Article 1). Teachers and students are trained to use various cognitive tools, such as Thinking Maps, Habits of Mind, Thinking Hats, and Q-Matrix Charts, which help cultivate and apply HOTS effectively in classroom settings.

Box Article 1: The i-THINK program

In 2013, Malaysia's MoE introduced the i-THINK program, initially piloted in 10 selected schools before expanding to 1,000 schools, and eventually, nationwide implementation in 2014. The programme was designed to foster higher-order thinking skills (HOTS) among students by integrating eight visual thinking maps into teaching across all subjects. These maps help students visualize connections between data and information, facilitating critical thinking and problem-solving.

2 BPK. Kemahiran Berfikir Aras Tinggi Aplikasi di Sekolah. In Kementerian Pendidikan Malaysia.

The i-THINK programme was developed in collaboration with the Malaysian Innovative Agency (MIA) and Kestrel Education from the United Kingdom, which also provided the initial teacher training. The thinking maps serve as graphic organizers that assist students in categorising, comparing, and managing information effectively, which are essential skills for HOTS. Research suggests that the brain processes 90% of information visually, making these maps an effective tool for learning (Paivio, 1990).

The thinking maps help bridge lower-order thinking skills (LOTS) with HOTS by guiding students through increasingly complex questions, from basic recall and understanding to application, analysis, evaluation, and creation. As students develop a deeper understanding of information, they can reorganize and represent it visually, which is crucial for cultivating higher-order cognitive skills.

Despite the rollout of the i-THINK programme, there remains significant gaps between the intended implementation of the i-THINK program and what occurs in classrooms (Yusoff, 2021). Although teachers were trained to use i-THINK maps to enhance HOTS, there is little evidence showing whether they successfully applied these methods. Most teachers tended to focus on lower-order thinking skills (LOTS) questions, with only a few integrating HOTS. Additionally, many studies found that teachers lacked a thorough understanding of how to effectively use the i-THINK maps, with inconsistent findings across different regions. For instance, while teachers in Sarawak showed readiness, they often did not implement the maps due to doubts about their effectiveness. Students' responses to the i-THINK maps were also mixed, with some embracing the concept and others showing indifference or lack of interest. This inconsistency raises questions about students' understanding and application of the maps, as well as the factors that influence their engagement.

Another significant reform introduced by the MoE in 2013 was the enhancement of student assessment methods. To more effectively evaluate the development of Higher-Order Thinking Skills (HOTS) from preschool through the end of secondary school, the Ministry integrated HOTS elements into both school-based and national assessments. School-based assessments now include components such as *Pentaksiran Sekolah (PS)* or School Assessment, *Pentaksiran Pusat (PP)* or Central Assessment, *Pentaksiran Psikometrik (PPsi)* or Psychometric Assessment, and *Pentaksiran Aktiviti Jasmani, Sukan Dan Kokurikulum (PAJSK)* or Sports and Co-curricular Assessment (Ministry of Education Malaysia, 2014). Additionally, in national exams like *Ujian Penilaian Sekolah Rendah (UPSR)* and *Sijil Pelajaran Malaysia (SPM)*, the percentage of HOTS-related questions has been gradually increased to better measure students' critical thinking and problem-solving

abilities. In addition, the Ministry has also provided manuals and guidebooks to support teachers in creating HOTS-based questions. These resources offer examples of constructs such as stimulus-based questions, real-life contexts, and varying cognitive levels to help teachers design effective assessments (Ministry of Education Malaysia, 2014).

In terms of co-curricular activities, the Ministry introduced tools for decision-making and problem-solving, and launched the 1Student 1Project (1M1P) initiative (Ministry of Education Malaysia, 2014b). This program engages students from Year 4 to Year 6 in primary school and Form 1 to Form 5 in secondary school. Primary students work collaboratively in small groups to complete a project over three years, while secondary students work individually on a project that spans five years (Ministry of Education Malaysia, 2014b).

To further support the implementation of HOTS, the Ministry has encouraged community and private sector involvement through initiatives such as the Adopted School program (Ministry of Education Malaysia, 2014g). In this program, private companies, such as Pintar Foundation, ASTRO, Bank Negara, and Khazanah Nasional, partner with selected schools to provide financial support, expertise, and skill development opportunities for students.

For capacity building, the Ministry has prioritised improving teachers' competencies in delivering HOTS through various professional development programs. These initiatives include internal school-level training, mentoring by peers and experts, and access to online learning platforms (Ministry of Education Malaysia, 2014a). To further support teachers, the Ministry has also provided a range of structured and unstructured teaching resources, including textbooks, digital tools, EduWeb TV, and the Frog Virtual Learning Environment (VLE; Ministry of Education Malaysia, 2014e).

HOTS: How has Malaysia progressed?

Malaysia is progressing, but still not quite there yet.

As the Trends in International Mathematics and Science Study (TIMSS)³ and PISA⁴ international assessments have demonstrated, Malaysian students still struggle with higher-order thinking skills.

While Malaysia has demonstrated some improvement in PISA scores up until 2018, it is still performing well below the OECD⁵ average. Alarmingly, the latest PISA scores in 2022 demonstrated a decline in Malaysia's PISA scores for reading, mathematics and science, as compared to previous years. While there was a decline in PISA scores globally, largely due to the impact of COVID-19, Malaysia saw the biggest drop in PISA scores in the ASEAN region, as compared to countries such as Indonesia, Thailand and Vietnam – the overall scores of Indonesia and Thailand decreased by 4.09% and 4.36% respectively, whereas Malaysia dropped 6.26% (see Figure 2). It also ranks significantly below high-income Asian economies, such as Singapore and South Korea that it aspires to compete against for innovation and knowledge-based investments (see Figure 3).

-
- 3 TIMSS is an international assessment that evaluates Mathematics and Science curricula worldwide. It assesses students in Grade 4 (equivalent to Year 4 in Malaysia) and Grade 8 (equivalent to Form 2 in Malaysia) across two key areas: content knowledge, including algebra and geometry, and cognitive skills, such as knowing, applying, and reasoning. First administered in 1995, TIMSS is conducted every four years and includes participation from over 59 countries. Malaysia has been involved in TIMSS since 1999, though initially only for Form 2 students.
 - 4 PISA, coordinated by the OECD, is a prominent international assessment conducted every three years. PISA evaluates the proficiency of 15-year-old students in Reading, Mathematics, and Science, with a focus on their ability to apply knowledge in real-world contexts rather than on specific curriculum content. The assessment includes countries beyond the OECD membership, with 88 countries participating in the most recent 2022 cycle. Malaysia first took part in PISA in 2010, which was part of the 2009 assessment cycle.
 - 5 Organisation for Economic Co-operation and Development (OECD)

Asia's Future Workforce: Shaping Responsive Education and Employment Policies for Youth and Beyond

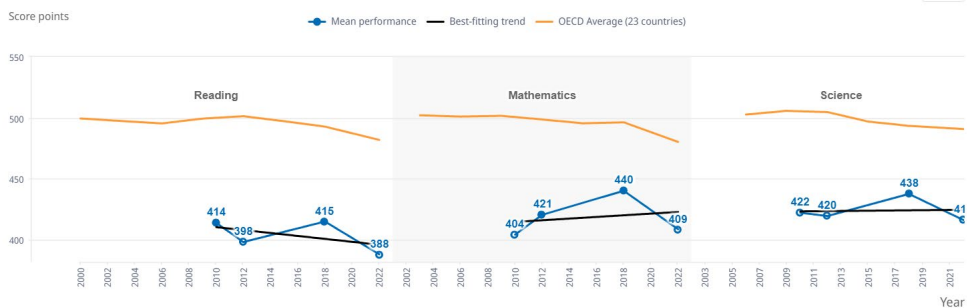


Figure 2: Trends in Malaysia's PISA performance (2010 to 2022; OECD, 2022)⁶

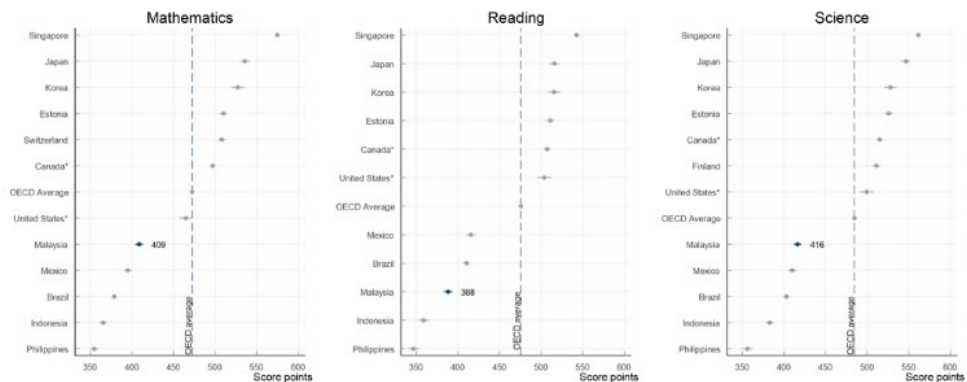


Figure 3: Mean 2022 PISA scores in mathematics, reading and science – comparison between Malaysia, OECD average, and selected comparison companies (OECD, 2022⁷)

Note: Comparison countries include the six highest-performing countries in each subject and the five countries with the largest population of 15-year-old students; Horizontal lines that extend beyond the markers represent a measure of uncertainty associated with mean estimates (the 95% confidence interval).

6 OECD. (2023). PISA 2022 results (Volume I and II) - Country notes: Malaysia. OECD iLibrary. https://www.oecd.org/en/publications/pisa-2022-results-volume-i-and-ii-country-notes_ed6fbcc5-en/malaysia_1d8e2061-en.html

7 OECD, PISA 2022 Database, Tables I.B1.2.1, I.B1.2.2 and I.B1.2.3

There is still a considerably significant socio-economic gap in the development of HOTS

In the 2022 PISA assessment, a student's socio-economic background had a notable impact on their mathematics performance in Malaysia, similar to trends observed in other countries. Socio-economic status accounted for 18% of the differences in math scores, suggesting that students from wealthier families typically achieved higher scores. This influence was slightly more pronounced in Malaysia compared to the OECD average, where socio-economic status explained 15% of the variation in math performance. This indicates a significant socio-economic gap in the development of higher-order thinking skills (HOTS) among Malaysian students. Over the past decade, the gap in math performance between the highest and lowest socio-economic quartiles has remained consistent in Malaysia, mirroring trends seen across OECD countries.

Malaysian boys generally lag behind girls in both reading and mathematics proficiency, indicating a gender gap in the development of HOTS

In Malaysia, girls outperformed boys in both mathematics and reading, with a 10-point lead in mathematics and a 31-point lead in reading, mirroring global trends where girls generally excel in reading and boys in mathematics. The proportion of top performers in mathematics is the same for both genders, with 1% of boys and 1% of girls achieving the highest scores. However, a larger percentage of boys are low performers: 63% in mathematics and 66% in reading, compared to 55% of girls in mathematics and 50% in reading. Over the past decade, from 2012 to 2022, the performance gaps in mathematics between boys and girls in Malaysia have remained consistent.

The effective implementation of HOTS in Malaysia is faced with many challenges

Student factor: Foundational gaps make it difficult for students to develop more advanced competencies such as HOTS

Research indicates that teachers in regular public secondary schools in Malaysia face challenges due to students' low proficiency levels, making it difficult to incorporate Higher-Order Thinking Skills (HOTS) into lessons (Aziz et al., 2017). Many students struggle with basic skills and Lower-Order Thinking Skills (LOTS), which creates a barrier to introducing more advanced concepts. Despite spending an average of 12.5 years in school, the typical Malaysian student achieves

learning outcomes equivalent to only 8.9 years of education. In contrast, students in Singapore and South Korea not only spend more years in school but also achieve significantly higher learning outcomes, equivalent to 12.8 and 11.7 years, respectively. Even Vietnam, a lower-middle-income country that spends much less on education, outperforms Malaysia, with students learning the equivalent of 10.7 years despite spending 12.9 years in school (World Bank, 2024).

One contributing factor to these lower learning outcomes in Malaysia is the insufficient preparation provided by early childhood education. Many children lack the necessary school-readiness skills when entering primary school due to issues with both access to and the quality of preschool education. More than 10% of young children in Malaysia do not have access to early childhood education, often due to limited awareness, availability in high-need areas, or affordability. Furthermore, preschool education is not mandatory for entering Primary 1. Quality issues are also prevalent, with SEA-PLM⁸ 2019 scores revealing that 24% of students lack adequate school-readiness skills. This problem is exacerbated among children from lower-income families, where only 64% meet school-readiness standards compared to nearly 89% of students from wealthier families. Since learning builds on early skills, these foundational gaps make it difficult for students to develop more advanced competencies later in their education.

Teacher factor: Teachers remain unprepared to implement HOTS effectively

While teacher policies in Malaysia are theoretically sound, their implementation may not be as effective as intended. The Malaysia Education Blueprint 2013–2025 emphasizes enhancing teacher quality, effectiveness, and professionalism (see Box Article 2). However, despite policies aligned with global best practices, many teachers report insufficient training to implement Higher-Order Thinking Skills (HOTS) effectively. Studies indicate that some teachers are uncertain about integrating HOTS into their lessons, as they lack the necessary training and experience.

8 The Southeast Asia Primary Learning Metrics (SEA-PLM) is a regional assessment program designed to measure and compare the learning outcomes of primary school students in Southeast Asia. SEA-PLM focuses on assessing students' competencies in reading, writing, mathematics, and global citizenship, typically at the end of primary education (equivalent to Grade 5).

For instance, Aziz et al. (2017) conducted a qualitative study involving 140 English teachers from 48 government-funded secondary schools in Johor to assess their understanding and application of HOTS in English language classrooms. The study revealed that out of 928 academic questions posed during 1,550 minutes of instruction, only 4% stimulated students' critical thinking and curiosity. The majority (96%) were low-level questions requiring simple recall. Additionally, only 25% of the verbs used in classroom questions promoted higher-order thinking, while 55% targeted lower-order thinking, and 20% were ambiguous, mainly instructing students to follow directions.

Moreover, even when teachers receive training on different pedagogical approaches, they may not be applying them effectively. Kamarudin et al. (2016) found that many teachers, especially those aged 40-59, were resistant to incorporating HOTS into their teaching, preferring traditional methods they have long relied on. These teachers often prioritize students' academic performance and grades, focusing on teaching to the test rather than fostering a deeper understanding of the material.

Box Article 2: Malaysia Education Blueprint 2013-2025 Teacher Development Strategy (Ministry of Education Malaysia, 2013; World Bank 2024)

The key components of the teacher development strategy in the Blueprint:

1. **Recruitment and Selection:** Establishing merit-based recruitment processes to attract high-quality candidates into the teaching profession.
2. **Professional Development:** Implementing continuous professional development programs to upgrade teachers' knowledge and skills, ensuring they are equipped to deliver high-quality education.
3. **Career Progression:** Providing clear pathways for career advancement based on performance, qualifications, and experience, incentivizing teachers to excel.
4. **Performance Management:** Implementing robust evaluation systems to assess and support teachers in enhancing their classroom effectiveness.
5. **Teacher Standards:** Establishing clear standards and expectations for teachers' conduct, competency, and professionalism.
6. **Leadership Development:** Offering opportunities to nurture and empower school leaders who can drive positive change and foster a culture of excellence.

7. **Recognition and Rewards:** Recognizing and rewarding outstanding teachers and school leaders for their contributions to education excellence.
8. **Collaboration and Networking:** Encouraging collaboration and networking among teachers, schools, and educational institutions to share best practices and promote professional growth.
9. **Support Systems:** Providing comprehensive support systems, including mentoring, counselling, and well-being initiatives, to address the diverse needs of teachers.
10. **Stakeholder Engagement:** Engaging stakeholders, including teachers, parents, communities, and policymakers, in designing and implementing teacher development initiatives to ensure their relevance and effectiveness.

Institutional factor: Substantial spending on education with limited outcomes

Many believe that East Asia's economic success is largely due to significant investments in education (Perkins, 2013; World Bank, 1992). However, despite Malaysia's substantial spending on education over the past decade, it has not achieved the same outcomes as countries like South Korea and Singapore. Malaysia, along with other ASEAN countries such as Indonesia and Thailand, has struggled to improve its performance in international assessments like PISA, despite spending comparable amounts on education. This raises the question of why Malaysia's progress lags despite its financial commitment.

One reason is that Malaysia's education spending has primarily focused on reducing student-teacher ratios and increasing enrolment by building more schools. However, evidence suggests that merely reducing class sizes does not significantly improve student performance (Asadullah, 2005; Gundlach & Wößmann, 2001). Studies indicate that rising school expenditure, particularly in reducing pupil-teacher ratios, has not strongly impacted student outcomes in several East Asian countries. This suggests that the effectiveness of education investment depends not only on how much is spent but also on how it is used.

A critical issue for Malaysia is the availability and quality of teachers. While countries like South Korea and Singapore have policies that attract and retain high-quality teachers, Malaysia faces a shortage of qualified educators (Perera & Asadulla, 2019). According to the OECD Teaching and Learning International Study

(TALIS) 2009, 45% of Malaysian school principals reported a shortage of qualified teachers, compared to only 19% in Korea (World Bank, 2013). Despite relatively competitive salaries, teaching is not an attractive career for top graduates in Malaysia. In 2010, 93% of applicants to the Bachelor of Education program did not meet the academic requirements, and in 2012, only 3% of offers to this program and 7% to post-graduate teaching courses went to high-performing students. In contrast, South Korea and Singapore recruit teachers from the top 10% to 30% of students (World Bank, 2013). These countries focus on teacher quality by offering competitive pay, high-quality pre-service education, and effective hiring practices, rather than solely trying to reduce class sizes. Singapore, for example, selects its teachers from the top third of their graduating cohort and provides centralized, high-quality teacher training through the National Institute of Education. The strong performance in PISA scores in South Korea and Singapore is largely due to the superior quality of their teachers (Perera & Asadulla, 2018).

How should Malaysia move forward to better prepare for the future?

Invest in developing foundational skills for the successful development of HOTS

Foundational skills are crucial for the effective development of HOTS. Malaysia must address significant gaps in the accessibility, equity, and quality of preschool education to ensure that HOTS development translates into tangible outcomes in the labour market. Children who receive quality early childhood education have a stronger academic trajectory compared to those who do not. To achieve universal preschool enrolment, the government should consider making early childhood education a prerequisite for primary school entry. Increasing financial aid for parents and preschool operators could support this effort. Specifically, reintroducing demand-side funding, such as fee assistance for affordable private preschools, could help low-income families who face barriers due to economic difficulties and insufficient public preschool availability. Additionally, providing supply-side financial incentives, such as grants or discounted operating spaces for preschools in high-need areas, could help operators manage costs more effectively.

Improving the quality of preschool education involves several key steps. Enhancing teacher qualifications, expanding professional development opportunities, and strengthening quality assurance systems are essential. The MoE should ensure that training is accessible and affordable for both public and private preschool staff. Strengthening local peer learning networks through the MoE's state

and district leaders, the Early Childhood Care and Education (ECCE) Council, and preschool associations can facilitate this. Introducing a policy mandating Continuous Professional Development for private preschool teachers, alongside ensuring a range of affordable training options, would further support quality improvements. Tailored support for teachers, based on their specific needs—whether in general pedagogy, addressing diverse learning needs, or improving English proficiency—is also necessary.

To further enhance preschool quality, the MoE should focus on better implementation of the National Preschool Quality Standards (NPQS), increasing food allowances for students, and providing more support to teachers for effective curriculum delivery. The NPQS should be communicated more effectively as a tool for continuous improvement rather than mere compliance. With inflationary pressures, the current food allowance of RM2.00 - RM2.25 per student is inadequate and requires revision. Investing in high-quality professional development for teachers, along with extending support through classroom observation and coaching, would improve curriculum implementation and ultimately contribute to the successful development of HOTS.

Enhancing the quality of teachers as the core of skills development among youth

To effectively implement HOTS, Malaysia must prioritize investments in enhancing teacher quality, from preschool to secondary school, as teachers are crucial to this process. Despite initial efforts, such as the ProELT program aimed at elevating English language teachers' proficiency, progress has been slow. The ProELT initiative (see Box Article 3), which combined face-to-face and virtual learning, successfully improved teachers' language skills, pedagogy, and student engagement. However, ongoing challenges indicate that further investments are needed to support teachers in effectively implementing HOTS.

To address these challenges, Malaysia should focus on four key strategies. First, investing in structured lesson plans can provide teachers with frameworks that address content gaps and improve instructional quality. Second, expanding training in differentiated instruction can help teachers cater to diverse student needs and enhance learning outcomes. Third, integrating educational technology (EdTech) effectively can support teachers in delivering structured lessons and tracking student progress. Lastly, adopting the dual-teacher model can extend the reach of high-quality instruction to areas with less experienced teachers.

Additionally, Malaysia should incorporate global best practices in teacher training by focusing on content knowledge, offering collaborative practice opportunities,

providing ongoing support, and including career incentives. By prioritizing these investments, Malaysia can improve the implementation of HOTS, ultimately leading to better educational outcomes and preparing students for the demands of the future.

Box Article 3: The Professional Upskilling for English Language Teachers (ProELT) programme

In Malaysia, relying solely on self-assessments to gauge teacher performance proved insufficient in addressing proficiency gaps among English language educators. To address this, a comprehensive evaluation was undertaken in 2012 to assess the proficiency of all 24,075 English teachers. The results indicated that 65% did not meet the “C1” level on the Common European Framework of Reference for Languages (CEFR), as mandated by the new Blueprint released in 2011. This assessment was crucial for understanding the scope of training needed, the speed at which it could be implemented, and the associated costs.

As a result, the MoE initiated the “Professional Upskilling for English Language Teachers” (ProELT) program. This program targeted the 14,479 teachers who had proficiency levels between B1 and B2, with the objective of advancing their skills to the next level—either from B1 to B2 or from B2 to C1.

To accommodate the diverse needs of teachers across the country, ProELT utilized a blended learning approach. The program included 240 hours of in-person training combined with 240 hours of online or offline self-paced learning, spread over a year. This flexible scheduling allowed teachers to engage with the training according to their individual needs and busy schedules. The materials and resources provided were specifically designed to align with the teachers’ current proficiency levels, ensuring that the training was both relevant and practical.

ProELT represents a strategic effort to enhance the quality of English language instruction in Malaysia. By addressing the identified proficiency gaps through targeted training, the program aims to improve the overall effectiveness of English language teaching and support better student outcomes.

Conclusion

Malaysia's approach to integrating HOTS in its education system highlights the importance of strategic implementation over sheer expenditure. The country's efforts to enhance critical thinking and problem-solving skills reveal that effective education reform is less about the amount of money invested and more about how it is utilized. By aligning curriculum design, teaching practices, and assessment methods with the needs of a dynamic job market, Malaysia demonstrates that thoughtful investment in education can lead to substantial progress. The lessons learned from Malaysia's experience underscore a crucial insight: the true impact of educational spending lies in its strategic application rather than its scale. As Malaysia continues to refine its education system, focusing on these principles will be key to preparing future generations for success in an ever-evolving global landscape.

Kirjane Ngu specialises in cross-cutting social policy and development research. Her published research covers a wide range of topics, including health, social protection, employment, education, and human rights, within the context of Malaysia and the ASEAN region. Kirjane's research centers on addressing the needs of vulnerable groups such as children, youth, persons with disabilities, indigenous communities, refugees, and asylum-seekers.

References

Aziz, A. A., Ismail, F., Ibrahim, N. M., & Samat, N. A. (2017). Investigating the implementation of Higher Order Thinking Skills in Malaysian classrooms: Insights from L2 teaching practices. *Sains Humanika*, 9(4-2).

Barbara, L., & Waugh, W. (2009). Developing higher level thinking. *Journal of Instructional Pedagogies*, 21.

Department of Statistics Malaysia. (2024). *Malaysia's economic indicators*. Retrieved from [URL]

Gundlach, E., & Wößmann, L. (2001). The fading productivity of schooling in East Asia. *Journal of Asian Economics*, 12(3), 401-417.

Kamarudin, M. Y., Yusoff, N. M. R. N., Yamat, H., & Ghani, K. A. (2016). Inculcation of higher order thinking skills (HOTS) in Arabic language teaching at Malaysian primary schools. *Creative Education*, 7(2), 307-314.

Ministry of Education Malaysia. (2013). *Malaysia education blueprint 2013-2025*. Retrieved from <https://www.moe.gov.my/en/dasar/blueprint>

Ministry of Education. (2014a). *Elemen KBAT dalam bina upaya*. Kementerian Pendidikan Malaysia.

Ministry of Education. (2014b). *Elemen KBAT dalam kokurikulum*. Kementerian Pendidikan Malaysia.

Ministry of Education. (2014c). *Elemen KBAT dalam pedagogi*. Kementerian Pendidikan Malaysia.

Ministry of Education. (2014d). *Elemen KBAT dalam pentaksiran*. Kementerian Pendidikan Malaysia.

Ministry of Education. (2014e). *Elemen KBAT dalam sumber*. Kementerian Pendidikan Malaysia.

Ministry of Education. (2014f). *Kemahiran Berfikir Aras Tinggi Aplikasi di Sekolah*. Kementerian Pendidikan Malaysia.

Ministry of Education. (2014g). *Sokongan komuniti & swasta untuk meningkatkan elemen KBAT*. Kementerian Pendidikan Malaysia.

Perera, L. D. H., & Asadullah, M. N. (2019). Mind the gap: What explains Malaysia's underperformance in PISA? *International Journal of Educational Development*, 65(1), 254-263. Elsevier Ltd. Retrieved from <https://www.learntechlib.org/p/207607/>

Perera, H. N., & Asadulla, R. (2018). *Comparing educational outcomes in Malaysia, South Korea, and Singapore: The role of teacher quality*. *International Journal of Educational Development*, 58, 1-12. <https://doi.org/10.1016/j.ijedudev.2017.11.003>

Sukla, D., & Dungsungneon, A. P. (2016). Students' perceived level and teachers' teaching strategies of higher order thinking skills: A study on higher educational institutions in Thailand. *Journal of Education and Practice*, 7(12), 211–219.

World Bank. (2023). *Malaysia: Overview*. Retrieved from <https://www.worldbank.org/en/country/malaysia/overview>

World Bank. (2024). *Bending bamboo shoots: Strengthening foundational skills*. Retrieved from <https://www.worldbank.org/en/country/malaysia/publication/bending-bamboo-shoots-strengthening-foundational-skills>

World Bank. (2024). *Shaping first steps: Early childhood education in Malaysia*. Retrieved from <https://www.worldbank.org/en/country/malaysia/publication/shapingfirststeps>

UNESCO Institute of Statistics. (2020). *UIS data: Enrolment by level of education*. Retrieved from <https://uis.unesco.org/en/news/uis-data-enrolment-level-education>



2

Section II. South Asia

Future of Work for Asia's Youth

How India Prepares Itself for the New Challenges

Partha Pratim Mitra

Abstract

Digitalization and automation are integral to changes impacting the future of work globally. Workers with higher qualifications in India often remain unemployed because they are not considered employable. India's major challenge has been the existence of a vast informal sector, with self-employment and casual employment as the key characteristics of this sector. The proportion of such employment, according to the Periodic Labor Force Surveys (PLFS), was 77.1% of workers in 2019-20, which increased to 79.1% in 2022-23. The recently proposed measures to address unemployment and enhance skill development seem to scratch the surface of the problem. India's jobs crisis is deeply rooted in its economic growth model, which bypassed low-skill manufacturing and grew instead on the back of a highly specialized services sector. A well thought-out employment policy is essential to address the structural issues which will, among other factors, prioritise skill development with equitable access to resources and promote development of labour-intensive industries.

1. The Global Context: Critical Questions in Brief

McKinsey analysts reiterate that in 2024, uncertainty has, if anything, deepened. New geopolitical disruptions, ongoing shifts in the global economic order, and the advance of AI, new technology platforms, and the energy transition are just some of the trends that signal the potential onset of a new era and have an influencing factor on a wide range of emerging medium- and long-term economic trends.

Digitalization and automation are integral to changes impacting the future of work. Some important factors influencing the future of work are:

- a. **Demographic Forces:** A young world will evolve into an aging, urban world. The age of communicable diseases may give way to an age of noncommunicable diseases, and inequality within countries may

increasingly challenge the social fabric. How will countries, institutions, and individuals adapt to demographic changes? How will capital and institutions respond to inequality?

- b. **Resource and Energy Systems:** There is a strong desire to shift investment toward low-carbon energy, described as the green transition, but total investment in all forms of energy appears to be struggling to keep pace with energy needs. Resilience, feasibility, and affordability concerns may challenge the velocity of the transition.
- c. **Capitalization:** The long-term trend toward capital deepening in economies seems evident. All attention seems to be turning towards Asia.¹

This chapter therefore focuses on policy transition in India brought about in the fields of science, technology, education, and skills. The impact in India will largely depend on government policy measures to prepare the workforce for this new reality. In studying this transition, we have analysed the trends in Labour Market Indicators (LMIs). The LMIs included in our analysis are the age and education levels of the labour force, the worker population ratio (WPR), labour force participation rates (LFPRs), and unemployment rates. Data on the LMIs come from:

- a. Data published in the various rounds of the Periodic Labour Force Surveys (PLFS) of the National Statistical Office (NSO) of the Government of India.
- b. Reports of International Labour Organisation, World Bank
- c. Websites of different Departments of the Government of India and NITI Aayog
- d. Published secondary literature

2. The Labour Market Situation in India

Estimates from PLFS data on age distribution of population show that for the years 2019-20, 2020-21, and 2021-22, the population in the age group of 15-29 years, which covers the youth, constituted about 27% of the total population of India, approximately 140 million, both in rural and urban areas.

1 BradleyChris, Jeongmin Seong, Sven Smit, and Lola Woetzel (2022)
On the Cusp of a new era Mckinsey Global Institute ,<https://www.mckinsey.com/capabilities/risk-and-resilience/our-insights/on-the-cusp-of-a-new-era>

India has the largest youth population in the world; around 66% of the total population (more than 808 million) is below the age of 35. The Indian labour force is set to grow by over 8 million per annum over the coming decade, most of which will be driven by youth entering the labour market.²

Identifying some of the main challenges in the Indian labour market

- i. Data on LFPR from PLFS shows that between the years 2019-20 and 2022-23, for both male and female populations in rural and urban areas combined in the 15-29 years age group, LFPR increased from 60% to 63.5% (Male) and from 20.6% to 24.5% (Female). If we, however, see the data separately for rural and urban areas, while the LFPR for rural youth increased from 60.85% to 65.5%, the LFPR for urban youth witnessed stagnant growth, from 58.35% to 58.4%. The LFPR for rural female youth during this period increased from 20.7% to 25.85%, while for urban female youth, it stagnated from 20.3% to 20.85%. Most of the decent jobs are, however, created in urban areas, and the stagnant LFPR is symptomatic of youth not participating in the labour market for jobs as decent jobs are scarce in rural areas.
- ii. Data on unemployment rates from PLFS show that in 2022-23, for people with higher qualifications and youth (15-29 years), unemployment rates have exceeded national unemployment rates for rural and urban areas combined. The rates of unemployment (%) are:

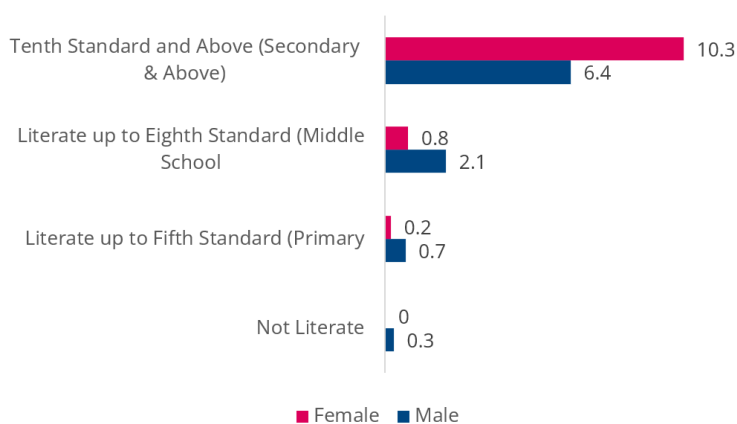


Figure 1: Rates of unemployment as per PLFS 2022-23

2 <https://www.ilo.org/regions-and-countries/asia-and-pacific/ilo-india-and-south-asia/areas-work/decent-work-youth-india>

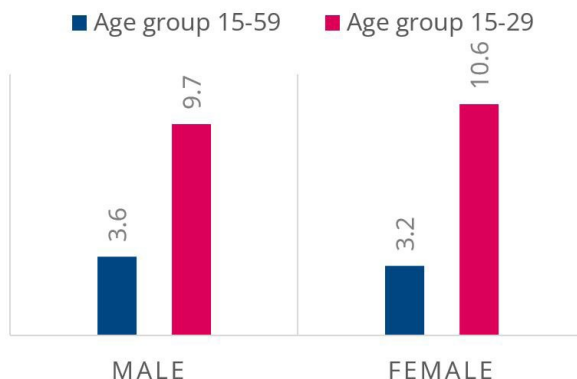


Figure 2: The national unemployment rates (%) for rural and urban combined

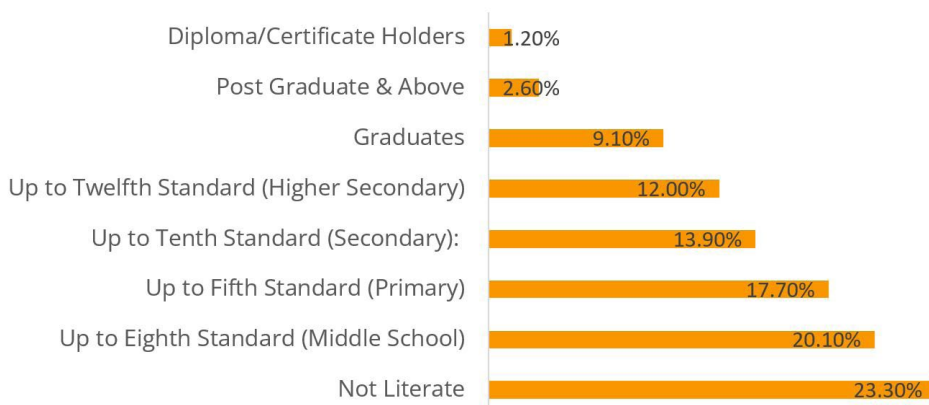


Figure 3: The percentage distribution of persons of age 15 years and above by highest level of education successfully completed, both rural and urban combined according to PLFS 2022-23

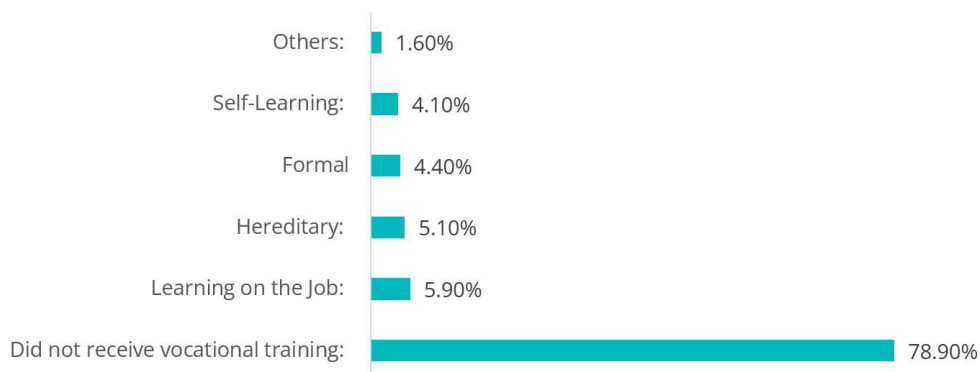


Figure 4: The percentage distribution of persons in the age group 15 -29 years (Youth) both rural and urban combined who either received vocational/technical training in some form and those who did not receive any vocational/technical training, according to PLFS

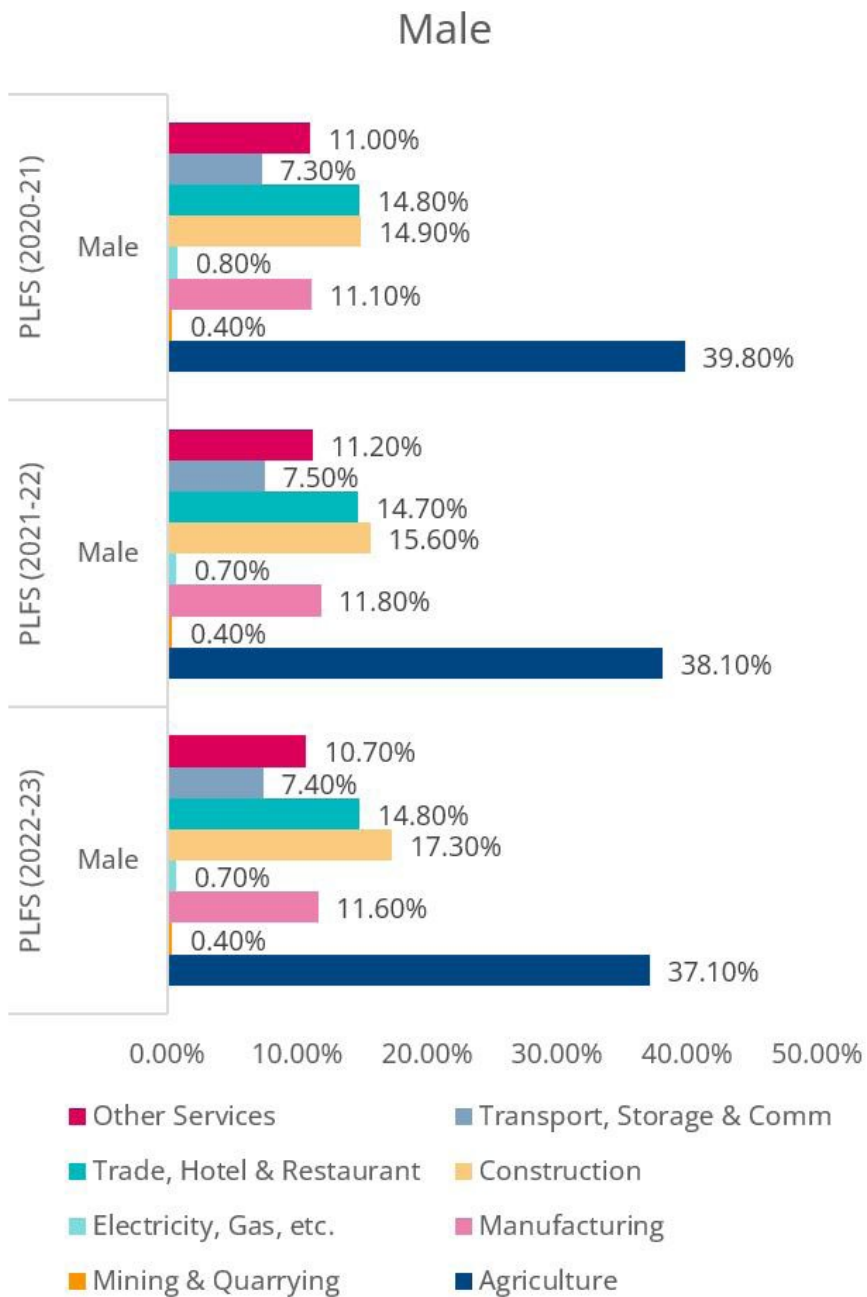
- iii. A look at the three labour market indicators according to the PLFS—LFPR, WPR, and Unemployment Rate (UR)—shows interesting trends for the year 2022-23. Among the population aged 15 years and above, the LFPR was highest for postgraduates and above. It reached 89.4% for rural and urban male workers. For female workers, the LFPR was highest for those with diplomas and certificates, at 51.9%. In other words, workers with higher qualifications participate in larger numbers in the labour market, either working or looking for jobs.
- iv. When it comes to actually working, a similar situation is observed, except for amongst women. The worker population rate across various educational qualification groups shows that it was highest (81.5%) for postgraduates and above, for both rural and urban male workers combined. For women, it was highest (44.6%) among those with no education. This highlights the unique challenges women face in employment.
- v. Unemployment rates also reveal that individuals with higher qualifications experience higher unemployment. Among men, diploma/certificate holders had the highest unemployment rate (11.4%) in both rural and urban areas. For women, graduates had the highest unemployment rate at 20.6%. When considering both men and women together, degree holders had a higher unemployment rate (13.4%) compared to diploma/certificate holders (12.2%) in 2022-23.

- vi. There is a direct relationship between higher LFPR and UR. For male workers, those with higher qualifications actively seek jobs in the employment market. This leads to a high LFPR for this group of youth. However, they often remain unemployed because they either do not find jobs that match their qualifications or are not considered employable. This explains the coexistence of a high LFPR and a high unemployment rate
- vii. India's major challenge has been the existence of a vast informal sector, with self-employment and casual employment as the key characteristics of this sector. The proportion of such employment, according to PLFS, was 77.1% of workers in 2019-20, which increased to 79.1% in 2022-23. In the evolving digital landscape, the emergence of gig workers in the workforce is also on the rise. According to a NITI Aayog study of June 2022, the number of gig workers is expected to increase from 7.7 million in 2020-21 to 23.5 million by 2029-30.³

3. Worker Distribution Across Sectors in India

The data in Figure 5 reveal that agriculture remains the dominant role, followed by construction, services, and manufacturing. Sections A-C and F detail the worker distribution in agriculture, mining, manufacturing, and construction, while the remaining sections focus on worker engagement in various service sectors.

3 India's Booming Gig and Platform Economy: Perspectives and Recommendations on the Future of Work - Policy Brief https://www.niti.gov.in/sites/default/files/2022-06/Policy_Brief_India%27s_Booming_Gig_and_Platform_Economy_27062022.pdf



Source: PLFS –Various Years

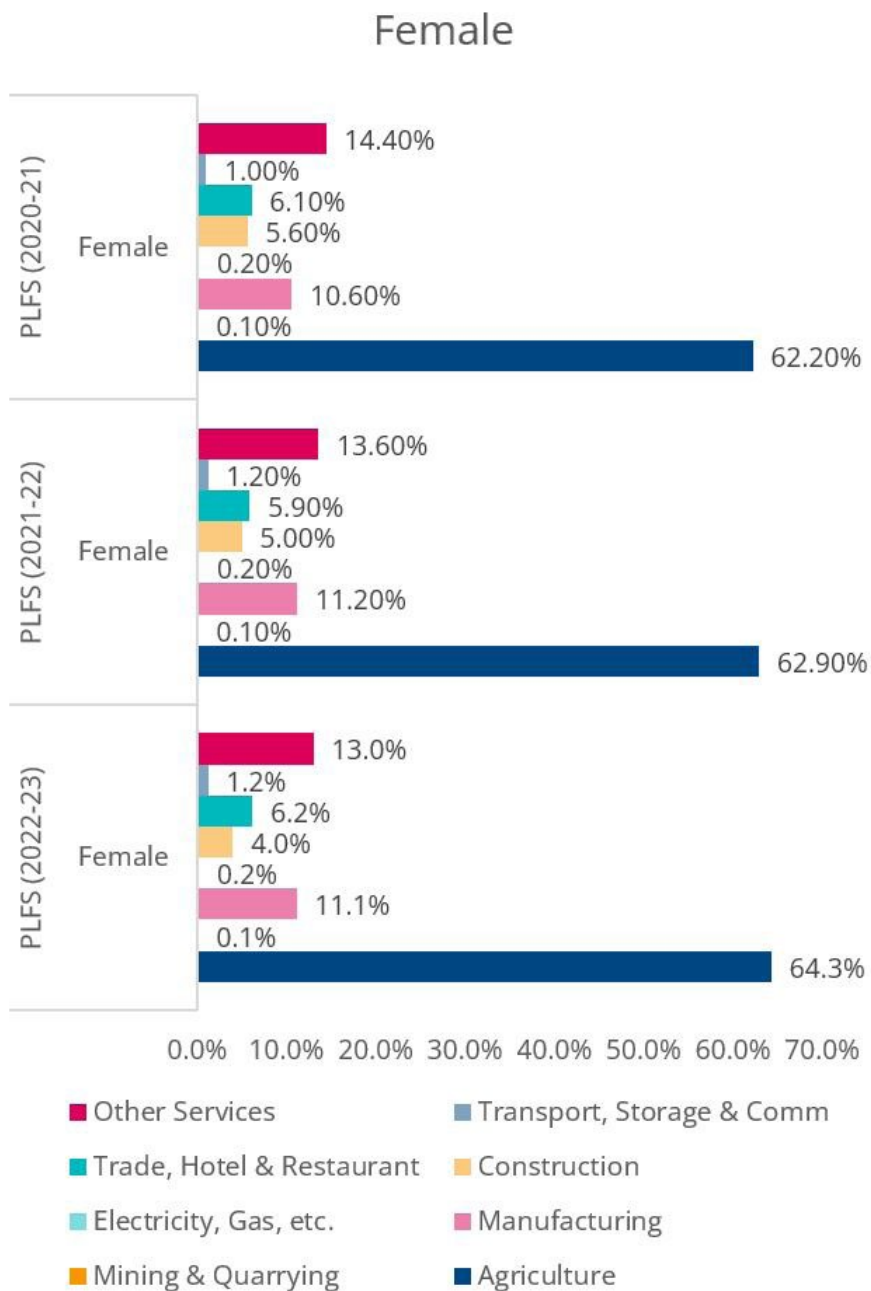


Figure 5: Percentage distribution of workers in usual status (ps+ss) by broad industry division estimated from PLFS (2020-21), PLFS (2021-22) and PLFS (2022-23) for both rural & urban workers combined; M (Male) and F (Female)

The data confirms India's well-known shift towards a service-driven economy. However, the COVID-19 pandemic and its aftermath revealed a crucial factor: agriculture continued to absorb a large number of workers, particularly females, while construction provided opportunities for males.

This trend underscores a major challenge for India's future of work: creating a more diversified workforce base, especially in the manufacturing sector, to accommodate the growing population. As the PLFS data suggests, the share of manufacturing employment for both rural and urban workers has stagnated around 11% over the past three years (11.4% in 2022-23, 11.6% in 2021-22, and 10.91% in 2020-21).

4. Role of Unincorporated Enterprises in the Indian Economy

The role of unincorporated enterprises in the Indian economy is very important. Accordingly, a need was felt to design an annual survey covering the unincorporated non-agricultural enterprises of the country. This necessitated the National Sample Survey Office (NSSO) to develop the idea of the Annual Survey of Unincorporated Sector Enterprises (ASUSE) for exclusively measuring various economic and operational characteristics of unincorporated non-agricultural establishments in the manufacturing, trade, and other services sectors (excluding construction). Employment in this sector increased to 2.74 crore in ASUSE 2022-23 compared to 2.13 crore in ASUSE 2021-22.⁴

The informal employment share in non-agricultural activities is exceedingly large in India. Furthermore, sectors that have high informality employ a sizable portion of female informal workers with low wages and poor working conditions. The informal employment share in non-agricultural activities is as high as 84%, and the share of female informal employment close to 85%. Among individual non-agricultural activities —such as transportation, construction, trade, manufacturing and services other than trade or transportation —the numbers look similar. For example, the informal employment shares in construction and trade are the highest at slightly above 97%. In construction, the female informal employment share is 99%,

4 Key Indicators of Unincorporated Non-Agricultural Enterprises (Excluding Construction) in India https://www.mospi.gov.in/sites/default/files/publication_reports/NSS_KI_73_2.34.pdf

and in trade 98%. Similarly in manufacturing 87% of employment is informal, with the female informal employment share at 94%.⁵

Findings of recent studies on the Indian labour market

Since 2018, there has been a notable upturn in key labour market indicators, including labour force participation, employment rates, and a decline in unemployment. This marks a significant departure from the trends of the preceding two decades. The positive trajectory persisted even during the COVID-19 pandemic, with particularly pronounced gains for women. However, a closer examination reveals a more nuanced picture. The quality of the jobs created during this period is a cause for concern. Despite accelerated growth in the non-farm sector compared to agriculture, the capacity of these sectors to absorb the surplus labour from rural areas remains inadequate, a persistent challenge that has hindered India's employment landscape for an extended period.

India's labour market has undergone significant transformation since 2018. While non-farm sectors have expanded, job growth lags behind economic growth. The pandemic accelerated these trends, with agriculture unexpectedly absorbing more workers, especially women. Contrary to past trends, female labour force participation increased post-2019, often in unpaid agricultural work. The service sector's growth has been accompanied by a rise in informal jobs, despite increasing salaried positions. The organized sector remains small. These structural changes necessitate strategic interventions in education, skills, and employment.⁶

India's economy has transitioned from agriculture to services, but employment remains heavily agrarian.

Technological advancements have been uneven, with agriculture, construction, and trade lagging. Non-farm employment grew 20% from 1983 to 2019, but most jobs were informal. On net, the share of regular wage work increased less than 3 % and that of the organised sector less than 2%. Regular wage and organized sector employment increased marginally.

5 Skilling India No Time To Lose, J.P.Morgan and National Council of Applied Economic research(NCAER) (2022), P4 <https://www.ncaer.org/wp-content/uploads/2022/08/Skilling-India-Report.pdf>

6 India Employment Report (2024): Youth employment, education and skills ILO & Institute of Human Development, : www.ilo.org/publns,p50

Salaried jobs surged from 15% to 25% between 2004 and 2018 but declined post-pandemic.⁷

Education and training are pivotal for driving economic growth and job creation. A higher secondary education serves as a gateway to better job opportunities. However, post-pandemic, barriers to accessing higher education may increase, deterring private investment and perpetuating a cycle of low education and income. Youth face heightened risks of unemployment, underemployment, or low-wage jobs. Those from marginalized communities often endure secondary employment, lacking social security and facing wage disparities. To bridge this gap, we need to invest in quality education, create more job opportunities, and address the challenges faced by marginalized workers.⁸

The demand for AI skills in India's services sector has surged significantly since 2016, mirroring global trends. However, this rise in AI talent correlates with a decline in demand for non-AI roles, especially in high-skilled occupations, leading to potential job displacement. Given India's existing labour market challenges, it is crucial to assess the country's readiness for this workforce transition in terms of education, skills, and technology sectors⁹.

In India, AI roles are predominantly concentrated within large firms. After 2015, demand for AI skills grew rapidly, increasing from 0.37% of all job postings that year to 1.03% in 2019. The financial sector, for example, experienced a tenfold increase in AI demand between 2016 and 2018, starting from a low base. These insights are based on a study by Copestake et al. (2024)¹⁰, which

7 State of Working in India(2023)Social Identities and Labour Market Outcomes, Azim Premji University, Bengaluru, <https://azimpremjiuniversity.edu.in/publications/2023/report/state-of-working-india-2023-social-identities-and-labour-market-outcomes>, p23

8 62nd Annual ISLE Conference: A Report - Reserach NoteThe Indian Journal of Labour Economics (2022) 65:897–925 <https://doi.org/10.1007/s41027-022-00400-x> p916

9 Alonso Cristian and Margaux MacDonal(2024) Advancing India's Structural Transformation and Catch-up to the Technology Frontier IMF Working Paper Asia and Pacific Department International Monetary Fund WP/24/138
<https://www.imf.org/en/Publications/WP/Issues/2024/07/08/Advancing-Indias-Structural-Transformation-and-Catch-up-to-the-Technology-Frontier-551435>

10 Copestake Alexander,et al (2024)AI and Services –Led Growth;Evidence from indian Job Adverts, <http://copestake.info>, August

analyzed a random sample of 80% of job vacancies posted on an online job platform between 2010 and 2019.

Given the challenges in the Indian labour market, we would now examine India's preparedness for the transition in the future of work across education, skills, science & technology sectors.

5. Science Technology and Education and Skills – Role of Government Policies in Preparing for Transition

The Science, Technology and Innovation Policy of 2020 has the following broad vision:

- i. To achieve technological self-reliance and position India among the top three scientific superpowers in the decade to come
- ii. To attract, nurture, strengthen and retain critical human capital through a 'people centric' science, technology and innovation (STI) ecosystem
- iii. To double the number of Full-Time Equivalent (FTE) researchers, Gross Domestic Expenditure on Research and Development (GERD) and private sector contribution to the GERD every 5 years
- iv. To build individual and institutional excellence in STI with the aspiration to achieve the highest level of global recognitions and awards in the coming decade.¹¹

The period following the Science and Technology Policy 2003 is marked by among others a rise in publication ranking, and a steady increase in institutional and human capacity.¹²

The New Education Policy (NEP) of 2020 focuses on human development to enable students to develop to their maximum potential, emphasizing foundational literacy and numeracy, and early childhood education. All these aspects will require sustained attention to implementation.

Post-independence, India prioritized higher education, establishing Indian Institutes of Technology (IITs) and Indian Institutes of Management (IIMs).

11 Science, Technology, and Innovation Policy Government of India Ministry of Science & Technology Department of Science & Technology(2020) p6 https://dst.gov.in/sites/default/files/STIP_Doc_1.4_Dec2020.pdf pp6-7

12 Ibid ,p9

While this created global competitiveness in IT, pharmaceuticals, and high-skill manufacturing, it neglected primary education. This led to a mismatch between a vast young workforce and limited job opportunities. Recognizing this in the 1980s, India focused on increasing primary and secondary school enrolment. Achieving near-universal enrolment by 2022, however, did not translate to improved learning outcomes. Consequently, millions remain unemployed while employers cite a skilled labour shortage.¹³

Government policies are crucial in bridging the gap between the formal and informal sectors by providing quality services to disadvantaged communities. Initiatives like public health programs, education and skills upgrades, and affordable housing schemes can help integrate these sections into the formal economy, giving them access to better jobs and services. India needs a comprehensive strategy to reduce persistent gender gaps in workplace participation. The first pillar of a gender transition path would be expanding educational opportunities to reduce the significant gender gap at schools and colleges.

The second pillar is to align the country's growth strategy with its gender strategy, making it more inclusive. This would involve a greater focus on closing gender gaps in access to economic opportunities, earnings, and productivity.

The third pillar is to enhance the political representation of women. India has already made positive strides in increasing women's representation in local elections. These efforts could be scaled up to encompass state and federal elections as well.¹⁴

6. Government Interventions in Skill Development

Under the Government of India's Skill India Mission (SIM), the Ministry of Skill Development and Entrepreneurship (MSDE) emphasizes skill, re-skill and up-

13 Muralidharan Karthik and Abhijeet Singh(2021) RISE India Country Research Team India's New National Education Policy: Evidence and Challenges https://riseprogramme.org/sites/default/files/2021-10/Indias_New_National_Education_Policy_Evidence_Challenges%20.pdf; Also see Karthick Muralidharan (2024) Accelerating India's development - A state led Road map for Effective Governance, Penguin Random House, India, pp325-332

14 Ejaz Ghani (2023) Assessing gender disparities in entrepreneurship and employment in India <https://www.ideasforindia.in/profile/ejaz.html>

skill training of youth across the country under various schemes viz. *Pradhan Mantri Kaushal Vikas Yojana* (PMKVY), *Jan Sikhshan Sansthan* (JSS), National Apprenticeship Promotion Scheme (NAPS) and Craftsman Training Scheme (CTS) through Industrial Training Institutes (ITIs).

Apart from MSDE, more than 20 Central Ministries/ Departments are implementing skilling / upskilling training programs through schemes, such as *Deen Dayal Upadhyaya Grameen Kaushalya Yojana* (DDU-GKY), the Rural Self Employment Training Institutes (RSETI) under Ministry of Rural Development, *Deen Dayal Antyodaya Yojana*- National Urban Livelihood Mission (NULM) under Ministry of Housing and Urban Affairs, etc.

The SIM aims at enabling youth of India to get future ready, equipped with industry relevant skills. MSDE in coordination with the Ministry of Education launched the Skill Hubs Initiative (SHI) as a pilot project under PMKVY 3.0. in 2021. The Skill Hubs Initiative focused on introducing skill training programs in the education ecosystem as envisioned in the National Education Policy (NEP), 2020. The Skill Hub Initiative utilized existing infrastructure at Educational Institutes to impart vocational training to the target candidates which assisted in vocational learning being introduced at an early stage with multiple well-defined pathways for candidates to continue with their chosen vocations.

PMKVY 4.0 launched in 2022 also aims to synergize vocational and educational streams and increase network of quality training providers by increasing partnership of educational institutions through Skill Hubs. Skill Hubs can be set up in Central and State Government Schools, Higher Educational Institutes (HEIs), Colleges, and Universities (including Skill Universities) with requisite infrastructure for providing Short Term Trainings under PMKVY.

In addition, the Government has taken other steps to align skill development programs with the evolving needs of the job market:

- i. The training programs offered under the schemes of MSDE are developed in collaboration with industries, keeping in view market demands. Thirty-six Sector Skill Councils (SSCs), led by industry leaders in the respective sectors, have been set up by National Skill Development Corporation (NSDC) which are mandated to identify the skill development needs of respective sectors as well as to determine skill competency standards.
- ii. Future ready job-roles addressing the requirement of emerging sectors like Drone, Artificial Intelligence (AI), Robotics, Mechatronics, etc., have

been prioritized under PMKVY 4.0. Under CTS also, new age courses have been developed to meet the demand of futuristic job roles in emerging technologies.

- iii. The National Council for Vocational Education and Training (NCVET) has been set up as an overarching regulator establishing regulations and standards to ensure quality in the Technical and Vocational Education and Training (TVET) space.
- iv. The Awarding Bodies recognised by NCVET are expected to develop the qualifications as per the industry demand and map them with the identified occupations as per the National Classification of Occupation, 2015, of Ministry of Labour and Employment and obtain industry validations.
- v. Directorate General of Training (DGT) is implementing the Flexi MoU Scheme and Dual System of Training (DST). These initiatives are meant to provide training to ITI students in an industrial environment.
- vi. Courses aligned to National Skills Qualification Framework (NSQF) also have components of On Job Training (OJT) and employability skills.
- vii. Under NAPS, apprenticeship training and increasing engagement with industrial establishments for undertaking apprenticeship programs is promoted.
- viii. Government of India has signed Migration and Mobility Agreement with ten countries viz., U.K.: France, Germany, Israel, Taiwan, Austria, Mauritius, Australia, Portugal and Finland for aligning skilling with demand in these countries.
- ix. Government of India has announced setting up of 30 Skill India International Centers for catering to the demand for skilled workers for foreign countries.¹⁵

15 Government of India, Ministry Of Skill Development And Entrepreneurship, Lok Sabha Unstarred Question NO. 335 Answered On 5.02.2024. <https://sansad.in/getFile/loksabhaquestions/annex/1715/AU335.pdf>

7. Achievements of Skill India Mission Operation (SIMO): 2018-2022

- Short-term skill development was enhanced in priority sectors to address the growing labour market demand—especially from the micro, medium and small enterprises (MSME), targeting the most disadvantaged youth.
- Around 6 million young people have been trained, of whom 34 percent are women, and 40 percent of all trainees under SIMO found paid employment within six months of completing the training.
- More than 700 District Skill Committees were set up across all the country's districts to facilitate decentralized planning for market-relevant skill development. The project supported the training and certification of nearly 33,000 Trainers and 19,000 Assessors.
- More than 160 Market Aligned Qualification Packs were developed and aligned with the National Skill Qualification Framework (NSQF). These qualification packs include teaching and learning materials, training manuals and other relevant information needed to be trained to perform a particular job role.
- SIMO supported the development of the Skill India Portal, a one-stop database that captures the training life cycle of candidates, accreditation and affiliation of the training centres, onboarding of the awarding bodies for industry standards, and other quality assurance mechanisms like data on trained trainers, assessors, assessment, and certification. The project supported the training and certification of nearly 33,000 Trainers and 19,000 Assessors.
- The project has supported the critical consolidation of the central and state scheme's management information systems through the Skill India portal. This has become the one-stop database for all short-term skill development information. The streamlined and readily available data will continue to aid the MSDE's data-driven approach toward decision-making.¹⁶

16 Help india Build a skilled Inclusive Workforce for a future, (2023) <https://www.worldbank.org/en/results/2023/11/03/helping-india-build-skilled-inclusive-workforce>

8. New Approach of Government to Employment and Skill Development

Employment

The new employment approach incentivizes job creation through a three-pronged strategy:

- Enrolling new hires in the EPFO (Employees' Provident Fund Organization).
- Recognizing and supporting first-time employees.
- Providing support to both employees and employers.

First Timers

To encourage new workforce entrants in the formal sector, a one-month salary will be provided. This will be disbursed as a direct benefit transfer of up to ₹15,000 in three installments to first-time employees registered with the EPFO. To be eligible, the monthly salary must not exceed ₹1 lakh. The scheme is projected to benefit 210 million young people.

Job Creation in Manufacturing

The objective is to incentivize additional employment in the manufacturing sector, linked to the employment of first-time employees. An incentive will be provided at a specified scale directly to both the employee and the employer with respect to their EPFO contribution in the first 4 years of employment. The scheme is expected to benefit 30 lakh youth entering employment and their employers.

Support to Employers

This scheme aims to encourage job creation across all sectors. Employers will receive a monthly reimbursement of up to ₹3,000 for two years towards their EPFO contributions for each new employee earning less than ₹1 lakh per month. This incentive is expected to create an additional 50 lakh jobs.

Skill Development

The approach towards skill development is focussed on bringing more youth under TVET (Technical and Vocational Education & Training), giving access to finance through loans and introducing internship in big corporates.

i. TVET

Over a five-year period, 20 lakh youth will be skilled. To achieve this, 1,000 Industrial Training Institutes (ITIs) will be upgraded and organized into hub-and-spoke networks with a focus on outcomes. Curriculum and course design will be aligned with industry demands, and new programs will be introduced to address emerging skill needs.

ii. Skilling Loans

Loans of up to ₹7.5 lakh will be made available to 25,000 students annually through the revised Model Skill Loan Scheme. A government-backed fund will guarantee these loans.

iii. Education Loans

To assist youth ineligible for other government schemes, loans of up to ₹10 lakh will be provided for domestic higher education. Annual interest subvention of 3% will be offered to 100,000 students through e-vouchers.

iv. Internship

Opportunities will be provided in 500 top companies to 1 crore youth in 5 years to gain exposure for 12 months to real-life business environments, varied professions and employment opportunities. An internship allowance of ₹5,000 per month along with a one-time assistance of ₹6,000 will be provided. Companies will be expected to bear the training cost and 10 percent of the internship cost from their CSR funds.¹⁷

Impact of the Recent Measures

The recently proposed measures to address unemployment and enhance skill development seem to scratch the surface of the problem. The discourse on this issue is sharply divided in India. While some believe these measures will boost sentiments and eventually facilitate employment and skills-building, the benefits are likely to materialize only in the medium to long term, rather than triggering any immediate turnaround in the job market. For instance, the ambitious plan to hire 10 million interns over five years by the top 500 companies may be overly optimistic. The proposed internship stipend, capped at ₹5,000, could lead firms to restrict allowances, potentially diminishing

17 <https://www.indiabudget.gov.in/23-7-24>

the program's impact. However, the initiatives welcome incentivizing participation through stipends and ensuring students gain practical skills.

Despite these efforts, significant challenges remain. Labour market rigidities persist, and technological advancements can be slow to adapt. Moreover, the process of skills-building will take time before its benefits are fully realized. The predominant concern is that while the recent measures focus on incentivizing employment and skill generation, they overlook a more fundamental issue: the lack of sufficient private sector investment, which is itself a result of weak consumption demand in the economy.

As long as this core problem remains unaddressed, employment generation may not keep pace with the growing labour force. To tackle this, a comprehensive national employment policy is urgently needed. Such a policy would create a roadmap for job creation by linking investment with employment generation across various sectors.

India's jobs crisis is deeply rooted in its economic growth model, which bypassed low-skill manufacturing and grew instead on the back of a highly specialized services sector. This disrupted the crucial link between economic growth and job creation. Furthermore, the growth model failed to invest adequately in essential public goods, such as quality health and education, despite the overall economic expansion. As a result, the formal sector has struggled to absorb the increasing number of educated youth, leading to rising youth unemployment.

A well thought-out employment policy is essential to address these structural issues. Such a policy should aim to re-establish the connection between economic growth and job creation, ensuring that growth translates into broad-based employment opportunities, particularly in sectors that can absorb the vast and diverse labour force in the country.

Conclusion

India's economic shift from agriculture to services challenges future employment. Technological advancements and digitalization may hinder job creation for a growing young workforce. This could push low-skilled workers back to agriculture, a sector currently limited in high-quality employment opportunities. To address this, India needs to prioritize quality and relevant education, including vocational training. A demand-driven system aligned with industry needs is crucial to prepare the workforce for the future. Equitable access to education and resources will be key to propelling individuals towards higher-skilled jobs.

By prioritizing skill development with equitable access, India can navigate the changing work landscape. This will ensure continued economic growth and create a more inclusive and prosperous future for its workforce. Investments in infrastructure, health, and education are also necessary to achieve these goals.

Partha Pratim Mitra is Advisor to Organizations in the areas of labour, skills and employability. He held appointments in the Government of India as Principal Labour and Employment Advisor to the Ministry of Labour and Employment, Government of India; Chief Economic Adviser in the Ministry of Rural Development; Joint Secretary of the Ministry of Social Justice and Empowerment; and Economic Adviser in the Ministry of Finance, Department of Financial Services. At present, he is with the Awareness Foundation for Environment and Skill Development, Kolkata, India, of which he is the Founding Member.

He holds a Master of Arts degree from the Department of Economics at Calcutta University, and a Bachelor of Law (LLB) from the Law Faculty at Delhi University.

Appendix

Definitions

The **labour force** implies the 'economically active' population and includes both 'employed' and 'unemployed' persons. Estimates of the labour force have been obtained based on the usual status (ps+ss) approach, i.e., by considering usual principal and subsidiary activity together. The **labour force according to the usual status (ps+ss)** is obtained by considering the usual principal status and the subsidiary status together. The estimate of the labour force in the usual status (ps+ss) includes (a) the persons who either worked or were seeking/available for work for a relatively long part of the 365 days preceding the date of the survey (principal status – ps) and also (b) those persons from among the remaining population who had worked at least for 30 days during the reference period of 365 days preceding the date of the survey (subsidiary status).

The **labour force participation rate (LFPR)** is defined as the percentage of persons in the labour force among the persons in the population. The **worker population ratio (WPR)** is defined as the percentage of persons employed among the persons in the population. The **unemployment rate (UR)** is defined as the percentage of unemployed persons in the labour force. The **percentage of workers in usual status (ps+ss) having particular levels of education among persons with that level of education** is defined as the education level specific to the WPR. The **highest level of education successfully completed by the person** has been considered as the education level of the person.

The Future of Work for Nepal's Youth: Challenges and Opportunities

Mr. Mahesh Raj Bhatta¹

Abstract

This paper examines the future of work for Nepal's youth, focusing on the challenges posed by high unemployment, mass outmigration, and limited domestic job opportunities. Nepal's reliance on labor migration has created risks for long-term economic growth, especially as young people leave in large numbers to seek education and employment abroad. The paper highlights the key factors driving this outflow, including skill gaps, underemployment, and the allure of better living standards overseas. In response to these challenges, the paper identifies significant opportunities for growth within emerging sectors such as technology, agriculture, fintech, and e-commerce. By leveraging technological innovation and entrepreneurship, Nepal can create a more inclusive labor market that retains its youth. The paper concludes with actionable recommendations for stakeholders, urging investments in education, infrastructure, and entrepreneurial ecosystems to harness the potential of Nepal's youth and drive sustainable economic development.

Key Words: Nepal, Future of work, Youth Migration, Digital and Technological Divide, Digital Literacy, Employment.

Overview

Nepal, with its predominantly youthful population, faces significant challenges in preparing its youth for the future of work. As nearly 40% of the country's population is between 16 to 40 years under the age of 25 (Rana, 2024), the current labor market struggles to provide adequate employment opportunities, leading to a mass outflow of young people seeking education and better job prospects

1 The author is Research Officer at the Centre for South Asian Studies (CSAS), Kathmandu.

abroad. This trend of youth migration has become an urgent issue, as it not only drains the country's talent but also leaves behind aging communities with limited economic dynamism. While remittances from migrant workers have been a critical source of income for many households, the long-term effects of such migration pose serious risks to Nepal's economic growth, particularly through the loss of potential innovators and entrepreneurs.

This paper aims to address these pressing issues by examining the current state of the labor market, identifying the key drivers behind youth outmigration, and exploring the opportunities that exist within emerging sectors. The study focuses on the significant gaps between the skills of the labor force and the needs of the market, as well as the technological advancements that offer hope for reversing the trend of youth outflow. In light of global technological changes, nascent industries in Nepal, such as information technology, fintech, agriculture, and tourism, offer new avenues for youth employment and entrepreneurship.

Purpose and Scope

The central objectives of this paper are to:

- Analyze the challenges facing youth in Nepal's labor market.
- Identify the key drivers pushing youth toward migration for education and employment.
- Explore emerging sectors and technological innovations that can provide new opportunities for the country's young workforce.

This paper is structured into four main sections: an examination of the labor market and youth employment challenges, a discussion on the drivers of youth outmigration, an exploration of opportunities in emerging sectors, and strategic recommendations for stakeholders to address these challenges. By focusing on both the obstacles and opportunities facing Nepal's youth, this paper aims to provide actionable insights for policymakers, educators, and businesses, ultimately fostering an inclusive labor market that retains talent and promotes sustainable economic development.

Section 1: Youth in the Labor Market

Current Labor Market Challenges

Nepal's labor market is largely characterized by underemployment and a mismatch between the skills provided by its education system and the demands

of employers. Many youth, particularly those in rural areas, find themselves either unemployed or in precarious informal jobs with little job security. This section will examine critical indicators such as the rate of unemployment, underemployment, and job availability in various sectors, with a particular focus on the outflow of labor to Malaysia and the Gulf Cooperation Council (GCC) countries.

Out of Nepal's 30 million population, an estimated 3.5 to 8 million young people are working in India. Given the unique historical relationship between Nepal and India, characterized by an open border and the absence of visa or work permit requirements, many Nepalese migrate to India for both long-term and seasonal work. Additionally, there is no formal system for tracking the movement of these migrant workers, making it difficult to determine the exact number of Nepalese working in India. Additionally, about 5 to 6 million youth are employed as migrant workers in countries such as Malaysia, South Korea, Japan, and the GCC nations. Of those migrating abroad for work, 81% are men and 19% are women (Ministry of Labour, Employment, and Social Security, 2022). During the fiscal year 2022-23, a record-breaking 750,000 youth left Nepal for foreign employment, with more than 2,000 departing daily through legal channels (Ministry of Labour, Employment, and Social Security, 2023). Many others also migrate illegally. According to the International Labour Organisation (ILO), the unemployment rate among Nepalese youth aged 15 to 29 is 19.2% (International Labour Organization, 2022). This job scarcity has made the youth more desperate than ever due to limited employment opportunities within the country.

While foreign employment has contributed significantly to reducing poverty and increasing household incomes, it also creates several issues such as the exploitation of workers, vulnerability to global economic shocks, and over-reliance on remittances. Furthermore, the lack of decent jobs within Nepal forces many young people to migrate abroad, leaving behind an aging population and creating a growing skills gap.

Section 2: Drivers of Outflow – Lack of Opportunities at Home

Causes of Migration for Employment and Education

The lack of opportunities within Nepal- whether due to unemployment, underemployment, political instability, or limited educational and career growth-remains a major driver of outmigration. As long as these issues persist, many Nepalese youth will continue to seek better prospects abroad in search of a brighter future for themselves and their families. Several key factors contribute to this trend:

Unemployment and Underemployment: Nepal struggles with a high unemployment rate, especially among youth, with limited job openings that do not match the growing labor force. Many graduates find it difficult to secure employment, forcing them to seek work abroad.

Low Wages and Poor Working Conditions: Even when jobs are available in Nepal, they often offer low wages and poor working conditions, making it difficult for individuals to sustain a decent standard of living. In contrast, foreign employment offers significantly higher wages, making it an attractive option.

Limited Educational Opportunities: The domestic education system is often criticized for its outdated curricula, lack of infrastructure, and limited seats in quality institutions. As a result, many students pursue higher education abroad, seeking not only better academic programs but also career advancement opportunities.

Political Instability and Economic Stagnation: Nepal's political instability and slow economic growth have created an environment where many young people feel uncertain about their future prospects. The inability of the state to foster a climate conducive to entrepreneurship, job creation, and professional growth further pushes youth to look for opportunities overseas.

Global Exposure and Better Living Standards: The allure of international exposure, better living conditions, and access to a global network motivates many young Nepalese to explore migration. Studying or working abroad is seen as a pathway to gaining competitive skills, higher salaries, and a better quality of life.

The large-scale outmigration of Nepali youth is primarily driven by a lack of opportunities within the country. These factors combined have made migration an appealing option for many Nepalese youth, who see limited opportunities for personal and professional growth within their home country.

The Increasing Trend of Students Going Abroad

The paper will also discuss the increasing trend of Nepalese students seeking education abroad. In the fiscal year 2022/2023 alone, over 117,000 students received a No Objection Certificate (NOC)² to study overseas (Ministry of Education, Science and Technology, 2023). This trend is particularly worrying because it not only drains potential talent but also increases capital outflows

2 An NOC is a government document provided to Nepalese who want to study abroad.

with more than 100 billion rupees being spent on overseas education³, putting additional pressure on Nepal's fragile economy. Many of these students choose not to return, exacerbating the brain drain.

Many Nepali youth are moving abroad to pursue higher education, aiming for better career opportunities. Students often seek educational opportunities overseas due to limited availability of seats, outdated curricula, and inadequate infrastructure in Nepal. Popular destinations for Nepali students include the United States, Europe, United Kingdom, Australia and Canada, where they pursue degrees in various fields.

The decision to study abroad is motivated not only by the desire for a quality education but also by better job prospects. In today's globalized world, international exposure can lead to high-paying jobs and career growth opportunities, which are harder to come by in Nepal. The prospect of higher wages and a better quality of life also drives young adults to seek employment abroad. Nepal's education system has not evolved much over time, with exam passing being the primary focus for most students. In contrast, Nepali youth studying or working abroad gain valuable global exposure, cross-cultural experiences, and networking opportunities, all of which make them more competitive and help them advance their careers.

Section 3: Opportunities in Emerging Sectors- Nascent Industries and Technological Advancements

Despite these challenges, Nepal's economy presents several growth opportunities, particularly in sectors such as Information Technology (IT), tourism, and renewable energy. Technological changes, especially in digital literacy, e-commerce, and the gig economy, offer untapped potential. This section will discuss how emerging industries and IT sectors are transforming Nepal's economic landscape and how these sectors can create new opportunities for youth.

Technological advancements have provided a sense of hope for Nepalese youth, encouraging some to stay in the country and explore opportunities. In the post-COVID period, several returning youth who gained new skills and knowledge abroad have started engaging in startups and these emerging sectors, contributing to the country's growing entrepreneurial landscape. These advancements are reshaping traditional industries and creating new avenues for growth, employment, and entrepreneurship. Here are some key sectors where

3 As per the Nepal Rastra Bank (NRB), which is the Central Bank of Nepal.

technological innovation is creating opportunities:

Agriculture: Digital Farming and Agri-Tech Solutions

Agriculture remains the backbone of Nepal's economy, employing over 60% of the population (Ministry of Agriculture and Livestock Development: Department of Agriculture, GoN, 2024). Many students who pursued agricultural studies abroad, along with a significant number of workers who gained experience in the agricultural sector and acquired modern technological skills, have begun applying their knowledge upon returning to Nepal by launching new agricultural startups and enterprises. For instance, many Nepalese students and workers travel to countries like Israel, South Korea and Japan to learn advanced agricultural techniques and expertise, which they later implement back home. The integration of technology into agriculture- through precision farming, remote sensing, and data analytics- is transforming the sector. Emerging innovations such as:

- Agricultural drones for crop monitoring
- Mobile apps providing weather forecasts and market prices
- E-commerce platforms for selling agricultural products
- Agri-tech startups offering advisory services to farmers

These technologies are helping farmers increase productivity, reduce waste, and access better markets. Youth can capitalize on these changes by developing skills in agri-tech, creating startups that solve agricultural challenges, or working with digital platforms that enhance farm-to-market supply chains.

Finance and Digital Payments: Fintech Revolution

Nepal is experiencing rapid growth in the fintech sector, particularly with the rise of mobile banking and digital payment platforms like e-Sewa, Khalti, and Fonepay. With increasing smartphone penetration and internet access, the financial sector is becoming more inclusive, reaching remote areas where traditional banking is limited. Opportunities for youth include:

- **Fintech entrepreneurship:** Developing new payment platforms, microfinance solutions, or block chain-based services.
- **Digital banking and cyber security:** Working with banks and startups to enhance security and expand access to financial services.
- **Mobile app development:** Creating apps that streamline financial transactions and offer innovative solutions for both businesses and consumers.

Tourism: Tech-Driven Experiences

Tourism is a critical sector for Nepal, and technology is playing a major role in revitalizing the industry post-pandemic. Virtual reality (VR), augmented reality (AR), and digital marketing are changing how destinations are promoted and experienced. Additionally, online booking platforms and travel apps have made travel more accessible. Youth are and can further leverage these changes by:

- **Developing tech-based tourism solutions:** Creating apps for bookings, digital guides, and immersive virtual experiences.
- **Digital content creation:** Producing digital marketing content (videos, blogs, VR tours) to promote tourism destinations.
- **Sustainable tourism tech:** Innovating in eco-friendly travel services using technology to monitor and manage environmental impact.

Information Technology (IT) and Software Development

The IT and software development sector in Nepal holds tremendous potential for growth and innovation. As digital transformation accelerates globally, Nepal is also embracing the opportunities presented by IT to modernize industries, create jobs, and foster entrepreneurship. With the rise of IT training centers, coding boot camps, and universities offering computer science degrees, Nepal is developing a tech-savvy workforce. Many young people are gaining skills in programming, data science, and cyber security, making them highly competitive in the global market. Educational institutions and online platforms are playing a key role in training the next generation of IT professionals. Youth with skills in programming, AI, data science, and software engineering can:

- **Join tech startups or outsourcing firms:** Nepal is emerging as an attractive destination for IT outsourcing due to its competitive labor costs and a growing pool of skilled developers, designers, and IT professionals. Many international companies are outsourcing software development, web development, and IT services to Nepali firms, and this trend is expected to grow.
- **Entrepreneurship:** Develop innovative tech solutions or applications targeting local or international markets.
- **Expansion of Tech Startups:** Nepal has seen a rise in tech startups focusing on areas such as software development, mobile app creation, cloud computing, and digital solutions. Incubators, accelerators, and tech hubs are supporting young entrepreneurs in the tech space. With relatively low startup costs and increasing access to venture capital, the environment for tech startups is becoming more conducive.

- **Freelance opportunities:** Take advantage of global freelance platforms to provide IT services and software development internationally. For instance, platforms like Upwork and Fiverr provide opportunities for Nepalese freelancers to tap into global markets.

E-commerce: Digital Marketplaces

E-commerce is on the rise in Nepal, with platforms like *Daraz*, *SastoDeal*, *HamroBazar*, and *Foodmandu* leading the way. As digital infrastructure continues to improve and more people embrace online shopping, the digital marketplace will become one of a key driver of economic growth. For young entrepreneurs, the opportunities are vast- whether in launching e-commerce platforms, enhancing logistics and delivery services, or capitalizing on digital payment systems and social commerce. This has created opportunities for youth to:

- **Launch e-commerce startups:** Sell products online, either locally produced goods or global imports.
- **Develop e-commerce solutions:** Provide logistics, payment gateways, and customer management services to e-commerce platforms.
- **Digital marketing expertise:** Help businesses expand their online presence through SEO, social media, and data-driven marketing.

Emerging technological changes across multiple sectors in Nepal are creating a wide range of opportunities for young people. From the integration of digital solutions in agriculture and tourism to the rise of fintech, e-commerce technology is opening new doors for employment, entrepreneurship, and innovation. Youth who are willing to develop digital skills and adapt to these trends can lead the transformation of Nepal's economy, contributing to its growth while building promising careers in the process.

Section 4: Strategic Directions and Actionable Recommendations

Government of Nepal has recognized the importance of preparing its youth for the rapidly changing global workforce. However, while several policies have been introduced, the gap between policy formulation and implementation remains a significant hurdle. To ensure that Nepalese youth are equipped to thrive in future job markets, the government, along with stakeholders, must focus on improving infrastructure, education, and fostering entrepreneurship. This section combines and analyzes the existing policies, evaluates their effectiveness, and provides actionable recommendations to better realize the opportunities for youth employment and economic growth.

1. Infrastructure Development: Bridging the Digital and Technological Divide

Current Status: The government's 'Digital Nepal Framework'⁴ is a step in the right direction toward promoting a digital economy by investing in technology infrastructure. However, internet penetration and technological access are still limited, especially in rural areas. This digital divide exacerbates inequality, as urban youth have far greater access to technology, training, and digital resources compared to their rural counterparts.

While the Digital Nepal Framework promotes digitalization, its progress has been slow, particularly in rural regions where infrastructure is inadequate. This limited access hinders the ability of youth to engage with modern job markets, particularly in sectors like e-commerce, digital marketing, and IT-based work.

Recommendations:

Expand Broadband Coverage: The government must prioritize extending internet access to rural and remote areas through partnerships with private telecom companies. This will provide youth with the digital tools they need to participate in the evolving workforce.

Affordable Internet Access: Providing low-cost internet services, especially in underserved areas, will promote inclusivity and access to online learning and digital employment opportunities.

Promote Digital Literacy Programs: Initiatives should be scaled up to ensure that all young people, regardless of geographical location, can acquire digital skills. Training programs could be offered through community centers and schools.

2. Education and Skills Development: Aligning Education with Market Demands

Current Status: Nepal's education system largely faces disconnect between what is being taught in schools and universities and the skills required in the modern job market. While the 'Technical and Vocational Education and

4 The Digital Nepal Framework (DNF) represents an ambitious government initiative aimed at boosting digital literacy and advancing ICT in Nepal. This framework serves as a roadmap, illustrating how digital initiatives can drive economic growth.

Training (TVET) Policy' and 'Youth Vision 2025' recognize the importance of skills development, implementation is inconsistent and often lacks alignment with the demands of high-growth sectors.

Despite the focus on skills development in policy, there is insufficient collaboration between educational institutions and industries. This results in youth graduating without practical, market-relevant skills, contributing to underemployment. The current curriculum remains outdated and does not cater to emerging sectors such as renewable energy, IT, and digital services.

Recommendations:

Curriculum Modernization: The government should collaborate with industries to revise the educational and vocational curricula to meet the demands of the labor market. This should include a focus on 21st century skills such as critical thinking, digital literacy, and data analytics.

Industry-Academia Collaboration: Strengthen partnerships between educational institutions and industries to offer practical internships, apprenticeships, and hands-on experience. This will help students develop employable skills.

Promote Vocational Training: Expand vocational training centers and ensure they cater to high-growth industries such as tourism, agriculture, and energy. This would bridge the skills gap and improve youth employability.

3. Innovation and Entrepreneurship: Fostering a Start-up Ecosystem

Current Status: The government's 'Nepal Startup Policy 2021' and 'Youth Vision 2025' emphasize the importance of entrepreneurship as a means of job creation. However, bureaucratic red tape, inadequate access to finance, and a lack of entrepreneurial culture still pose significant barriers to youth entrepreneurship.

While the 'Nepal Startup Policy 2021' aims to promote entrepreneurship, its impact has been limited due to the absence of a robust support system for young entrepreneurs. The business environment remains challenging, with complex regulations and limited access to credit for startups. Additionally, cultural attitudes towards risk and entrepreneurship are not sufficiently supportive, which deters many young people from pursuing entrepreneurial ventures.

Recommendations

Simplify Business Regulations: The government must streamline business registration processes, reduce bureaucratic hurdles, and ensure that tax policies are favorable to startups. This will encourage more youth to enter the entrepreneurial space.

Access to Finance: Improve access to financing for young entrepreneurs by providing grants, low-interest loans, and subsidies for startups in high-growth sectors like technology, agriculture, and tourism. Public-private partnerships could also be explored to fund innovation hubs and incubators.

Mentorship and Support: Establish more innovation hubs and incubation centers across the country, where young entrepreneurs can receive mentorship, technical support, and networking opportunities. These centers should facilitate collaboration between academia, industry, and government to foster a culture of innovation.

Promote a Risk-Taking Culture: The government, along with educational institutions, should work to promote a cultural shift towards risk-taking and entrepreneurial thinking. Recognition programs for successful young entrepreneurs and innovators could help normalize entrepreneurship as a viable career path.

4. Addressing Youth Unemployment and Underemployment

Current Status: Youth unemployment remains a pressing issue in Nepal, with high levels of underemployment also evident. The Prime Minister Employment Program (PMEP)⁵ seeks to provide temporary employment, particularly in rural areas, but has not yet had a long-term impact on reducing youth unemployment.

While PMEP offers temporary relief through job creation, it does not address the root causes of youth unemployment. The program lacks the mechanisms to provide sustainable employment opportunities, and there is insufficient focus on high-growth potential sectors such as agriculture and tourism.

5 The Prime Minister's Employment Program (PMEP) is a key initiative by the Government of Nepal designed to ensure a minimum of 100 days of employment for registered unemployed individuals through labor-intensive public works programs (PWPs). In cases where work is unavailable, it offers a subsistence wage to eligible households.

Recommendations

Focus on Sustainable Job Creation: The government should shift its focus from temporary employment programs to sustainable job creation in high-potential sectors. This could be achieved by investing in infrastructure development, improving market access, and providing technical support to industries such as agriculture, tourism, and manufacturing.

Active Labor Market Policies (ALMPs): Expand the use of ALMPs such as wage subsidies, job placement services, and internship programs to help young people gain practical experience and access the labor market.

Support for High-Growth Sectors: Invest in sectors like agriculture and tourism, which have the potential to generate significant employment for youth. This should include upgrading infrastructure, providing technical assistance, and improving access to markets.

5. Ensuring Social Protection and Labor Rights

Current Status: As the nature of work changes, particularly with the rise of the gig economy, it is crucial that labor laws and social protection measures evolve to cover workers in non-traditional employment. However, Nepal's labor laws currently do not adequately protect gig workers, freelancers, or those in informal employment.

While some progress has been made in extending social protection to more workers, gaps remain, especially for those employed in the informal and gig economies. Labor laws need to be updated to ensure that all workers, regardless of employment type, have access to social security benefits, healthcare, and workplace safety measures.

Recommendations

Update Labor Laws: The government must update labor laws to protect workers in emerging employment models, including gig workers and freelancers. This should include access to social security benefits, healthcare, and safety regulations.

Promote Inclusive Employment Policies: Address gender disparities and other forms of discrimination in the labor market to ensure that marginalized groups have equal access to employment opportunities. Policies that promote diversity and inclusion will strengthen the workforce and contribute to economic growth.

Nepal stands at a crucial juncture in preparing its youth for the future of work. While several policies have been introduced, the gap between policy formulation and implementation remains significant. To realize the opportunities for youth in a rapidly changing global workforce, the government must take decisive action to improve infrastructure, reform the education system, and promote entrepreneurship. By creating an enabling environment, fostering innovation, and addressing the digital divide, Nepal can harness the potential of its youth and ensure that they contribute to sustainable economic development. Through coordinated efforts between policymakers, educational institutions, and employers, Nepal can create a vibrant, inclusive economy that retains its youth and positions them for success in the future of work.

Conclusion

In conclusion, this paper has outlined the significant challenges and opportunities facing Nepal's youth in the evolving labor market. The country's heavy reliance on labor migration, coupled with limited domestic employment prospects, has created an environment where many young people see their future abroad. High unemployment rates, underemployment, and the lack of alignment between educational outcomes and market demands are key factors driving this exodus. Moreover, political instability and economic stagnation exacerbate the situation, further limiting opportunities for career growth within the country.

However, amid these challenges, the paper also highlights the potential of emerging sectors and technological advancements to reshape Nepal's economy and offer new avenues for youth employment. Sectors such as agriculture, fintech, e-commerce, tourism, and information technology (IT) are rapidly transforming due to technological innovation. The rise of digital literacy, agri-tech solutions, mobile banking, and the gig economy presents opportunities for young entrepreneurs and skilled professionals to thrive.

Strategic interventions from the government, private sector, and educational institutions are critical to harnessing these opportunities. Investments in digital infrastructure, curriculum modernization, vocational training, and entrepreneurship support are essential to bridging the skills gap and retaining talent. If Nepal can effectively implement these reforms, it stands to not only reduce youth outmigration but also foster sustainable economic growth driven by its youthful population.

By creating a conducive environment that nurtures innovation and supports the aspirations of young people, Nepal has the potential to reverse the brain drain and build a more inclusive and dynamic labor market. In doing so, it can empower its youth to contribute meaningfully to the country's future and position Nepal as a competitive player in the global economy.

Mahesh Raj Bhatta is research officer at the Center for South Asian Studies (CSAS), a Kathmandu based research think-tank. He obtained his Masters in International Relations from Pondicherry University, India. He was awarded a scholarship by the South Asia Foundation and was the recipient of 'UNESCO Madanjeet Singh' award during his Masters from 2011 to 2013. Mr. Bhatta was also awarded a scholarship for the summer school on Peace and Conflict Studies in 2010 from Oslo University in Pondicherry. In 2018, Mr. Bhatta was awarded with 'Professional Fellows Program on Governance and Society' by the U.S. Department of State. He also coordinates the South Asian think-tanks network called Consortium of South Asian Think Tanks. He has participated in various regional and international conferences and presented papers on regional and global pressing issues. His research and area of work is focused on South Asian regional cooperation including peace and conflict in the region, bilateral and multilateral cooperation, regional connectivity, radicalization and extremism, and climate change. Mr. Bhatta also teaches International Relations and Diplomacy at National College, Kathmandu University.

References

- Rana, D. (2024, April 1). Addressing youth aspirations. *The Kathmandu Post*. <https://kathmandupost.com/columns/2024/04/01/addressing-youth-aspirations>
- Central Bureau of Statistics Nepal. (2022). *National Labour Force Survey 2022*. Government of Nepal.
- Ministry of Labour, Employment, and Social Security. (2022). *Nepal Labour Migration Report 2022*. Government of Nepal. Retrieved from https://giwmscdnone.gov.np/media/app/public/298/posts/1715249334_10.pdf
- International Labour Organization. (2022). *Global employment trends for youth 2022*. Retrieved from <https://www.ilo.org/publications/major-publications/global-employment-trends-youth-2022-investing-transforming-futures-young>
- Ministry of Labour, Employment, and Social Security. (2023). *Annual Labour Report 2022/23*. Government of Nepal. Retrieved from https://giwmscdnone.gov.np/media/app/public/298/posts/1715249334_10.pdf
- Ministry of Education, Science and Technology. (2023). *Annual Education Report 2022/23*. Government of Nepal. Retrieved from <https://moest.gov.np/>
- Ministry of Agriculture and Livestock Development, Department of Agriculture. (2024). *Annual Progress Report 2023/2024*. Government of Nepal. Retrieved from https://doanepal.gov.np/downloadfile/DoA%20Annual%20Book%202081-03%2020_1721712021.pdf
- Ministry of Industry, Commerce, and Supplies. (2024). *National Start-Up Enterprise Policy, 2081*. Government of Nepal. Retrieved from <https://moics.gov.np/content/11424/11424-national-start-up-enterprise-p/>
- Ministry of Communication and Information Technology. (2022). *Digital Nepal Framework: Strategy and Policy Paper*. Government of Nepal. Retrieved from <https://drc.gov.np/storage/backend/pages/resources/others/D8lp6S0T-Bu0kqwXB7V90hB9aodF4v6qTLGzUvN7M.pdf>
- Ministry of Labour, Employment, and Social Security. (2018). *Prime Minister Employment Program Policy Document*. Government of Nepal. Retrieved from <https://www.pmep.gov.np/pmep-introduction>



3

Section III. East Asia

Future of Youth Employment in Japan

Yukie Hori

Abstract

The youth unemployment rate remained at a low level from the 1960s to the early 1990s. During this period, the practice of hiring new graduates en masse, selecting young people with no work experience while they were still in school based on their potential, and offering them stable, indefinite-term employment, was the mainstream. However, from the early 1990s until the mid-2000s, it became difficult for young people to secure stable employment. Those who graduated between 1993 and 2004, particularly during the difficult transition to employment, are referred to as the “employment ice age generation”. Afterwards, the economy turned toward expansion. Despite a shock due to COVID-19, as of 2024, most young people continue to be hired through mass recruitment of new graduates, and the youth employment situation remains favorable.

Over the past 25 years, the university enrolment rate for women has increased significantly, approaching that of men. However, the proportion of women entering natural science faculties remains the lowest among OECD countries. Japan’s female employment rate was often described as an “M-shaped curve,” which dipped during childbirth and then rose again as children grew older. However, in recent years, a new pattern known as the L-shaped curve has emerged, where the ratio of regular employment among women by age group peaks at 60% for those aged 25-29 and then declines thereafter.

In the future, there is concern that the shrinking youth population in Japan will lead to the decline of the mass hiring of new graduates in the labor market. This could make it more difficult for young people with no work experience to find jobs, potentially leading to an increase in youth unemployment. It is necessary to continue monitoring the changes resulting from the declining birthrate.

Introduction

This paper explores changes in the employment of youth and women in Japan since the 1990s and the government support provided to them. Finding

employment has been difficult for youth since the 1990s owing to the recession. Furthermore, Japan did not have employment support policies for youth at the time. Consequently, the transition from school to employment has long been difficult. Thus, Japan launched an employment support policy for youth in 2003 in earnest, whereas the more comprehensive Youth Employment Promotion Act was enacted in 2015.

Further, the university enrolment rate of Japanese women has increased since the late 1990s, whereas changes in rates of women's employment have been slow. However, policies have been expanded recently, and there has been a gradual increase in the number of women who continue to be full-time employees even after childbirth compared to those who leave work for childbirth and then start working part-time once the child is older. Moreover, the issue of fewer women entering STEM fields at university is also being gradually resolved.

However, as birthrates are declining more than projected, it is unknown whether Japan will undergo a loss or scarcity of young people in the labour market. Thus, we need to carefully pursue policies while learning from other countries.

Here, we will review the school education system of Japan and explain the 'simultaneous recruitment of new graduates', which is a characteristic of the school-employment transition in Japan. This is followed by a review of youth employment since the 1990s and an examination of changes in the employment of young women. Recent policies in Japan will be divided into policies regarding women's majors, youth employment, and entrepreneurship education, and future issues will be discussed.

1. The Japanese Education System

This is a review of the education system in Japan. Japan's modern education system was established with the promulgation of the school system in 1872. Subsequently, the Fundamental Law of Education and the School Education Act were enacted in 1947, establishing the 6-3-3-4-year schooling system. Compulsory education in Japan is up to lower secondary school, but the upper secondary school enrolment rate exceeded 90% in 1997. Currently, 98% of lower secondary school graduates enter upper secondary school, whereas approximately 3% drop out of upper secondary school annually. Approximately 70% of upper secondary school students attend regular classes, and a low proportion of upper secondary school students advance to professional courses.

Of the upper secondary school graduates of spring 2023, approximately 15% continued to employment, 60% continued to university, 20% continued to vocational school, and 5% did not fall under these options. The number of recent university graduate employment seekers exceeded the number of recent upper secondary school graduate employment seekers in 1997, with new university graduate job seekers becoming the majority of the new graduate labour market. Even so, a high demand for upper secondary school graduates remains, and Japan maintains a system which allows them to find stable jobs immediately after graduation. However, while male upper secondary school graduates can enter the manufacturing industry after graduation and find regular careers, female upper secondary school graduates are often employed in industries with high turnover rates, such as the food service and hospitality industry, and tend to have non-regular careers.

Furthermore, there has been a sharp rise in the university enrolment rate of women over the past 20 years, exceeding 50%, which is slightly lower than the men's enrolment rate at 55%. However, approximately 8% of them continue to junior colleges traditionally attended by women, and if the rate of enrolment in junior colleges is included as well, the university enrolment rate is about the same for both men and women. It is expected that the number of students joining junior college will decrease, leading to similar college enrolment rates for both men and women.

Even so, majors between men and women vary, with more men enrolling in STEM departments in their higher education compared to women. Looking at the percentage of female university entrants by field of specialization (International comparison: OECD Statistics), Japan has the lowest percentage of women in STEM majors (27%) among OECD countries. Further, Japanese women are more likely than men to enter STEM departments when beginning higher education, especially in the medical field, where it is easier to return to work after childbirth and childcare.

A higher proportion of women have found full-time employment immediately after graduating from university in recent years. This is because one-third of female university graduates are employed in social service industries such as healthcare and welfare, which have a shortage of labour. In the past, university-educated women were mostly in the fields of humanities and social sciences, worked jobs that were not highly specialised, and left work for childbirth. In contrast, they are now entering the medical field, where it is much easier to return to work after the maternity leave. On the other hand,

university-educated women are less likely than men to enter the business service industry (e.g. financial insurance and information processing) where they might easily obtain a higher income and social status. The majority of women with degrees from vocational schools are employed in the social service industry.

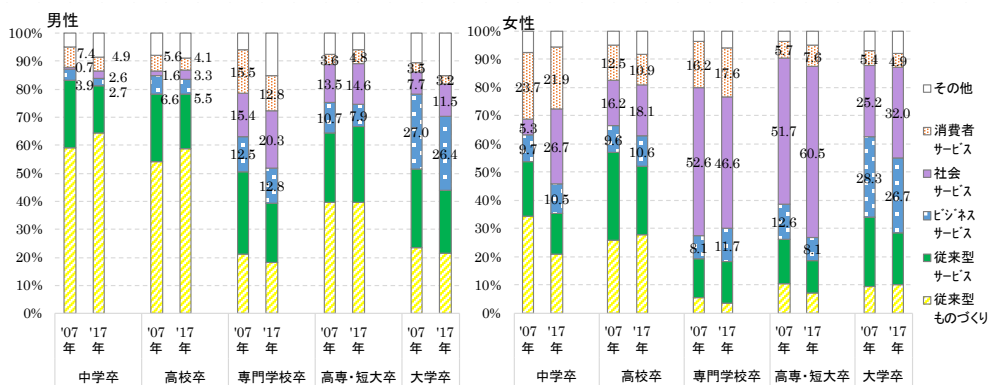


Figure 1. Industry Composition of Regular Employment of Employees Aged 15-24 (By Gender, Education)¹

Traditional manufacturing (e.g. manufacturing), traditional services (e.g. wholesale and retail), business services (e.g. financial insurance and information systems), social services (e.g. healthcare and welfare), and consumer services (e.g. hospitality and food).

Source: Iwawaki (2022)

1 Translation of Japanese Text in Graph:
 Top:
 男性: Male
 女性: Female
 Below:
 中学卒: Lower Secondary School Graduates
 高校卒: Upper Secondary School Graduates
 専門学校卒: Vocational School Graduates
 高専・短大卒: Technical College/Junior College Graduates
 大学卒: University Graduates
 Right:
 その他: Other
 消費者サービス: Consumer Services
 社会サービス: Social Services
 ビジネス サービス: Business Services
 従来型サービス: Traditional Services
 従来型 ものづくり: Traditional Manufacturing

Japan's labour policy defines the 15-34 age group as 'youth'. This paper uses the same definition.

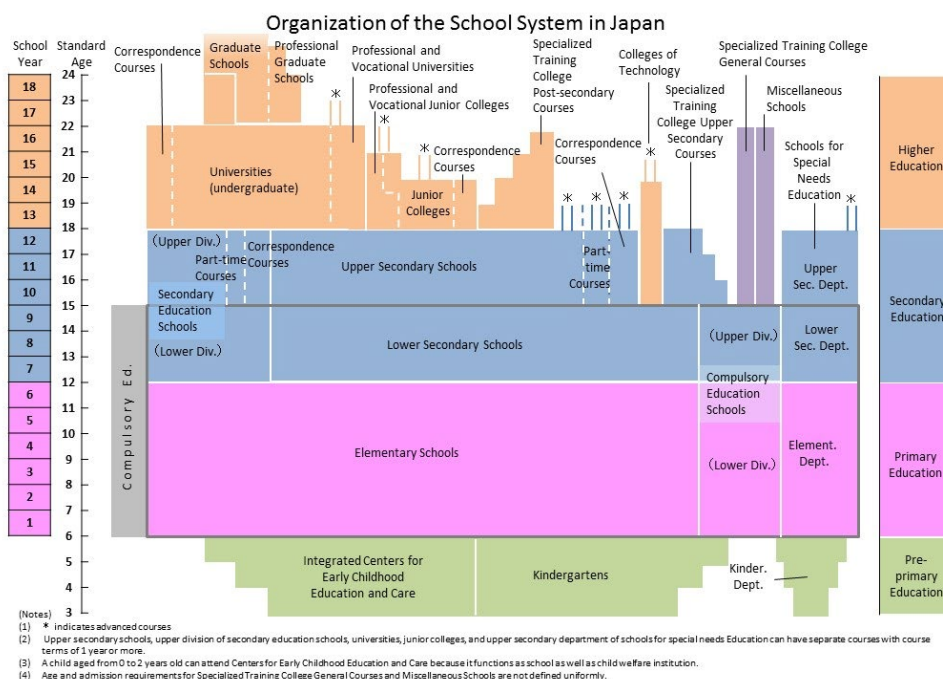


Figure 2. Diagram of the School System

Source: <https://www.mext.go.jp/en/policy/education/overview/index.htm>

2. School - Employment Transition System: Simultaneous Recruitment of New Graduates

As in other countries, the employment of youth in Japan is greatly affected by the economy; however, its impact tends to be particularly pronounced because of the practice of simultaneous recruitment of new graduates. The simultaneous recruitment of new graduates is a practice where companies hire students with no vocational experience immediately upon graduation as permanent workers and young people acquire vocational competencies through training and job rotation in the company. Public vocational training is not very popular in Japan, and schooling for vocational education is rare. Therefore, if young people, whether graduates from school or university, are not hired out through this simultaneous recruitment of new graduates, they lose the opportunity to acquire vocational competencies. For example, the

generation referred to as the 'employment ice age generation', which did not undergo simultaneous recruitment of new graduates, is already in its 40s, and many have been unable to find regular employment compared to other generations.

It is common for companies to begin recruitment of new graduates while they are in school, but the specifics of the practice up until employment differ by level of education. To prevent early recruitment of university graduates, universities and industry associations have reached employment agreements since 1953 regarding corporate public relations and the beginning of recruitment activities. Such agreements have repeatedly been voided by industry associations when there is a high labour market demand for new graduates and revived when the demand is low. In 2021, Keidanren (Japan Business Federation), the most influential business organization, withdrew from the agreement in place at the time, leading the government to lay down rules on when recruitment activities could begin. Companies in Japan were refrained from the use of internships for recruitment screening, as internships are meant for the purpose of education where students complete the programs during long vacations. However, the rules have been conditionally relaxed recently for the purpose of employing internships as a means of industry-academia collaboration.

Furthermore, there are regional practices on the timing of job hunting and applications for new graduates from upper secondary schools. New upper secondary school graduates primarily obtain jobs through job placements at their schools. Each prefecture has made agreements regarding employment practices for upper secondary school graduates to protect students who are underage and maintain order in the upper secondary school graduate labour market. Applicants are required to apply to one company at a time for two weeks from the beginning of the application period rather than multiple companies at a time.

On the other hand, people who have withdrawn from upper secondary school or university and are seeking employment find it difficult to get permanent employment, which has been an issue for many years.

3. Changes in Youth Employment

A summary of changes in youth employment in recent years is as follows. First, there has been a sharp decline in the number of young workers. The figure dropped from 20.35 million in 1997 to 17.11 million in 2017. Assuming

the same labour force participation rate as in 2017, it is expected to drop to 13.64 million in 2040 (MHLW 2021).

Second, the youth unemployment rate in Japan has remained low compared to other developed countries. Although it deteriorated during the “employment ice age” during the financial crisis, it has now reached a low level. The COVID-19 pandemic had a relatively low impact on the unemployment rate of the youth compared to other age groups (Figure 3).

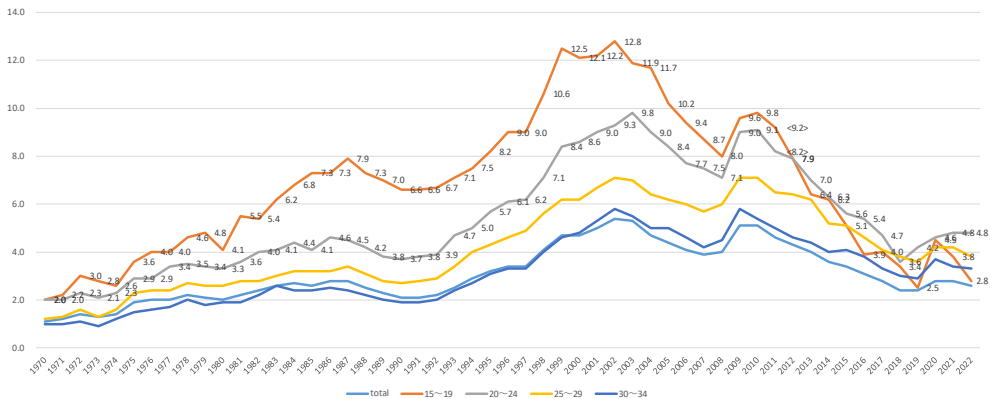


Figure 3. Changes in Japan’s Unemployment Rate by Age Group

Source: https://www.jil.go.jp/kokunai/statistics/timeseries/html/g0303_03.html

Third, the number of “freeters” (excluding young part-time workers and married women) peaked in 2003 at over 2 million but declined considerably to 1.37 million in 2021. This can be attributed to the drop in the youth labour force and the favourable employment situation. The traditional image of freeters as those working freelance as there are no full-time jobs is diversifying. According to the Japan Institute for Labour Policy and Training (2022), the percentage of Tokyo residents in the 25-34 age group who are freeters because they could not find full-time employment is the lowest in the past 20 years. On the other hand, compared to those who have never been freeters, a certain percentage who have experienced it reported they temporarily worked as freeters because of difficulty in working due to depression or disability. Furthermore, a certain number temporarily worked as freelancers to earn wages to advance their careers.

Fourth, while the number of youth is declining, the number of young unemployed people (not in education, employment, or training; 'NEETs') is on the rise. The number of youth unable to go to school or work due to the state of emergency during the COVID-19 pandemic increased temporarily in 2020 but returned to the original level in 2021.

While the number of freeters increases and decreases with fluctuations in the economy, the number of NEETs remains unaffected. There are various reasons for becoming NEET, but people who remain NEETs for a prolonged period find it difficult to participate in society.

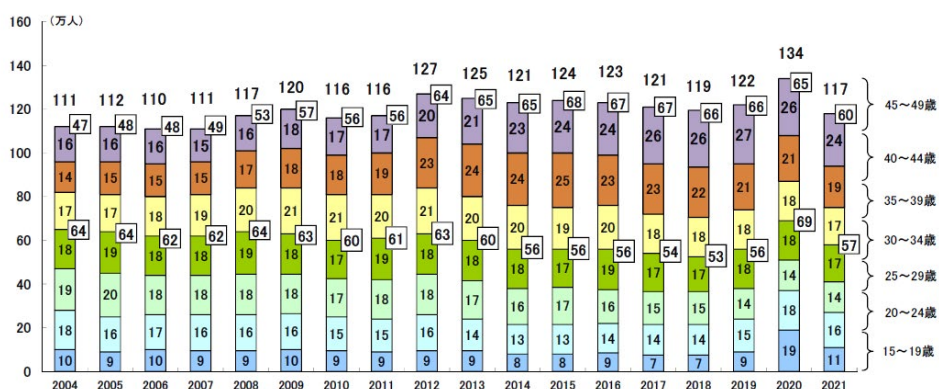


Figure 4. Changes in the Number of Unemployed (Age 15-49)²

Source: Labour Force Survey

Note: 'Unemployed' refers to those in the non-working population who are neither engaged in housework nor attending school.

4. Changes in Female Employment

Here we focus on the employment of young women (Table1). Although Japanese women find regular employment, they follow a standard career path leaving the workforce at the time of childbirth, which is known as an

2 Translation of Japanese Text in Graph:

万人: 10,000 people

15-19歳: Age 15-19

20-24歳: Age 20-24... etc.

M-shaped curve. This can be attributed to the strong gender role norm that mothers should devote themselves to child-rearing at home. An L-shaped curve has become apparent over the past few years, where the ratio of full-time employment for women by age group is highest, at 60%, for the ages 25-29, and declines afterwards.

However, an increasing proportion of women have continued full-time employment after giving birth over the past few years (Figure 5). To popularize men taking childcare leave, a childcare leave at birth system program was established, providing subsidies from employment insurance during childcare leave. Pregnancy discrimination (encouragement to retire after childbirth) is also now more regulated, and the gender gap after childbirth is narrowing.

	(Unit: %)						
	1985-89	1990-94	1995-99	2000-04	2005-09	2010-14	2015-19
Continued Employment (Used Childcare Leave)	5.5	8.1	11.2	15.3	21.1	31.6	42.6
Continued Employment (Without Childcare Leave)	18.4	16.3	13.0	12.2	10.2	10.8	11.2
Retired for Childbirth	37.4	37.7	39.3	40.3	40.8	31.1	23.6
Unemployed before Pregnancy	35.3	33.6	31.3	26.9	22.3	21.2	17.4
Unknown	3.3	4.3	5.2	5.3	5.6	5.2	5.2

Table 1. Changes in Employment of Wives Before and After Birth of First Child, by Year of First Child's Birth

Source: National Institute of Population and Social Security Research '16th Basic Survey on Birth Trends (Couple Survey)'

(*) Figure in the () is calculated as the percentage of those who continued work after

childbirth with the number of those who were employed before childbirth as 100

The wage gap between men and women has also been discussed in recent years. In Japan, the wage gap is explained by the company size and industry, as well as the employment status, length of service, and position. Among full-time employees in the same position, wages are higher if the employee with the company has been longer, and it is easier to be appointed to a higher position as well. The gender wage gap is attributed to the shorter durations of service and lower positions of women. Therefore, the gender gap in wages and promotions is unlikely to disappear soon; however, if the years of service continue to rise due to the continued employment of women, the gap may eventually narrow.

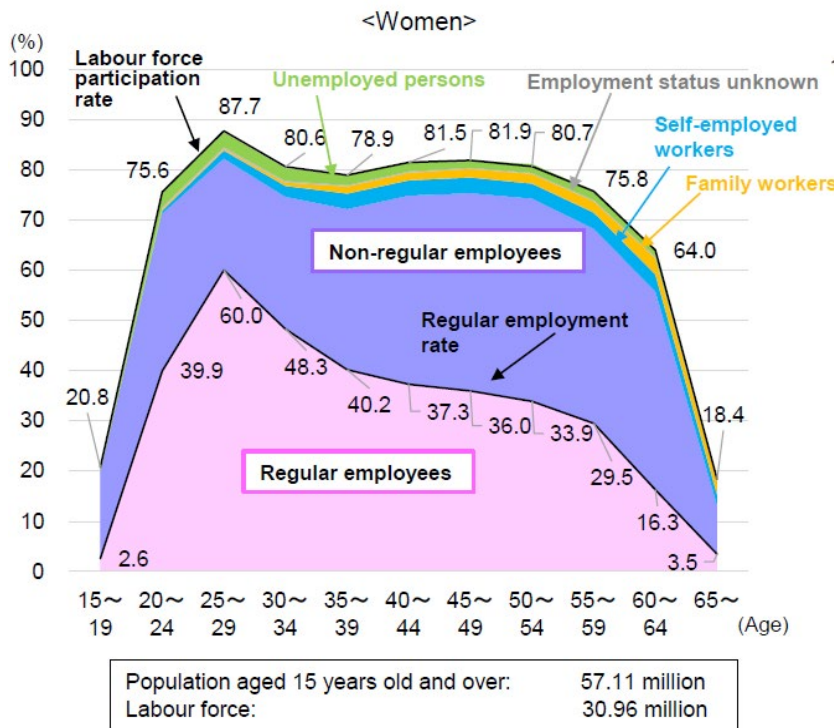


Figure 5. Changes in Female Employment Rate by Age

Notes: 1. Prepared from *Labour Force Survey (Basic Tabulation)*, Ministry of Internal Affairs and Communications.
 2. Labour force participation rate = Labour force (employed + unemployed) / Population aged 15 years old and over x 100.
 3. "Regular employees" is the total of "Executive of company or corporation" and "Regular employee".

Source: Gender Equality Bureau, Cabinet Office, Government of Japan 'The White Paper on Gender Equality 2023'

5. Digital Skills and Youth & Women

Opinions vary on how digital skills (especially generative AI) will affect employment in Japan. Japanese-style employment has the advantage of reassigning workers within a company without leaving them unemployed. Thus, in the past, Japanese companies have smoothly responded to technological innovations. The shortage of IT engineers in the current Japanese labour market is a challenge. Therefore, many universities are establishing information technology faculties that teach digital skills, and the field has become increasingly popular among high school students. The number of graduates is expected to increase in the future, and the spread of digital skills is expected to increase the potential of the youth.

Nevertheless, the majority of IT engineers using digital skills are men. As IT engineers have high incomes and a promising future, various types of public support exist for women to become IT engineers. However, as mentioned above, the proportion of women advancing to STEM departments remains low. Therefore, in recent years, leading universities have begun to establish 'female quotas' in STEM faculties to give priority to female students. Although 'female quotas' have faced criticism, they are expected to contribute to lowering the gender gap.

6. Youth Employment Policies

As mentioned already, Japan has a system of simultaneous recruitment of new graduates which makes it easier for youth to gain stable jobs. Thus, when the number of unemployed youth and "freeters" began to increase in the late 1990s, this was regarded as their responsibility. However, understanding of the youth's plight gradually spread in society. It was only in 2003, when the government formulated the Plan to Encourage Youth's Independence and Challenges, that the youth's lack of job security was acknowledged as a social problem and not a personal failure. Afterwards, career education was expanded, the Japanese version of the "dual system" modelled on the German one was established, and live-in vocational training facilities promoting young people's independence (no longer existing) were also developed. In 2006, the Regional Youth Support Stations (RYSS) were established to support NEETs, as well as Hello Work for the Youth and Hello Work for New Graduates.

However, these were temporary policies, followed by concerns regarding their discontinuation. Therefore, a permanent policy to support the youth was formulated in 2015 (Youth Employment Promotion Act). In addition

to establishing youth support organizations such as the RYSS, the Youth Employment Promotion Act included the following three points.

1. Active Provision of Workplace Information

To eliminate early job turnover due to mismatch at the new graduate stage and help young people pursue fulfilling working lives, a system was established to provide accurate information on working conditions and the workplace, such as average length of service, availability and content of training programs, and so forth.

2. Non-Acceptance of Certain Jobs at Hello Work

To ensure that Hello Work did not introduce new graduates to companies violating labour laws and regulations, a system was put in place under which new graduate job offers by such companies were not accepted at Hello Work for a certain duration.

3. 'Youth Yell' Certification Scheme

The Minister of Health, Labour, and Welfare established a system to certify small and medium enterprises that actively recruit and train youth and have excellent employment management conditions as Youth Yell certified.

The Youth Employment Promotion Act has been in effect for five years. The employment status of the youth during this period has remained generally positive despite the COVID-19 pandemic, and youth unemployment and instability have not become major issues(Figure6 Figure7).

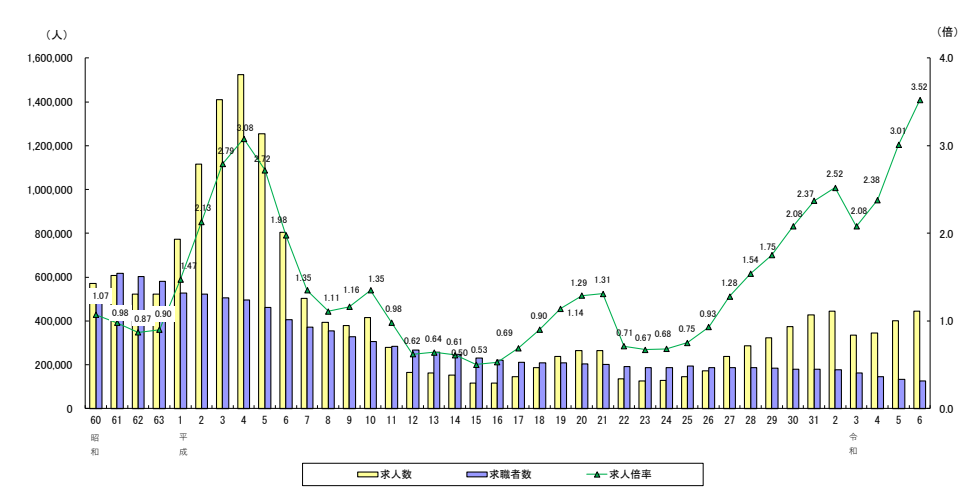


Figure 6. Trends in job openings and job-seeking status for Hello Work Job Openings for new Upper Secondary School Graduates (as of July-end)

Source: Ministry of Health, Labour, and Welfare

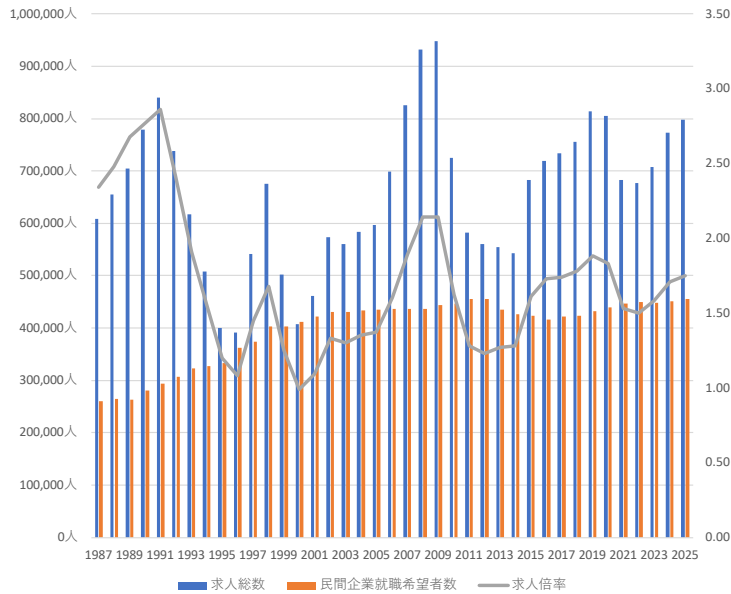


Figure 7. Trends in Changes in the Ratio of Job Offers to University Graduates³

Source: Recruit Works

- 3 Translation of Text in Figure:
 - Total Applicants
 - Number of Job Applicants to Private Companies
 - Job Opening to Applications Ratio

The challenge today is the increasingly complex issue of youth unemployment. During the 'employment ice age', employment support was provided exclusively to youth who were unable to find jobs. However, reasons for requiring support have become more diverse, including housing insecurity, health issues and disability, and a need to provide care to families. Regional Youth Support Stations have thus far attempted to meet such diverse needs, and regional cooperation is expected to become even more important in the future. However, with the decline in the population, the number of young people needing support and the providers of support will both decrease. Therefore, there is concern that RYSS will be required to provide support to wider areas, whereas the original philosophy of community support will fade.

7. Career Education to Foster Entrepreneurship

The percentage of youth in Japan wishing to start their own business has declined in recent years. Entrepreneurship education has been introduced in career education, and entrepreneurial support, such as public funding for startups for youth and women, is being provided. Entrepreneurship education as part of career education in Japan is not necessarily aimed at training entrepreneurs; rather, entrepreneurship is defined as 'the spirit of accepting rapid social changes and creating new value'. A wide range of people are expected to learn entrepreneurship. This is expected to be demonstrated not just through entrepreneurship but also by creating new businesses within existing companies, developing innovative technologies, and solving regional issues.

Although these policies have been introduced recently, entrepreneurship education is being expanded in startup ecosystem cities, and the hope is that coordination between policies will yield results.

8. Conclusion: Future Challenges in Japan and International Cooperation

Japan's population will continue to age, and numerically, young people form the minority. Simultaneous recruitment of new graduates has been the mainstay of recruitment by Japanese companies thus far; however, with the decline in the number of young people, mid-career recruitment is expected to become more popular. If mid-career recruitment of experienced people with existing skills becomes mainstream, it may lead to more companies refraining from recruiting new graduates who need to be selected based on their potential and trained within the company. If that happens, simultaneous

recruitment of new graduates will become less common, and Japan's youth unemployment rate will rise.

In terms of employment in Japan, it is difficult to predict whether there will be a scarcity of young people or whether they will be in the minority in the future. However, in passing the Japanese society on to the next generation, providing employment support to youth who will become increasingly scarce will undoubtedly be more important than ever. At the same time, it is also essential to support the 'ice age generation', the youth of the past who have non-regular careers today, as part of our responsibility to future generations.

Although the employment rate of women is rapidly rising, it is unclear whether the social security system and social norms will change at the same speed. Possibly, the gender role division of labour will remain unchanged, and women will take more responsibilities at work and home alone.

Further, an ageing society will require numerous workers in the social service industry, such as health and nursing care. Although the proportion of youth working in the social service industry in Japan is increasing, there is a need to focus on training young people who can respond to new technological changes.

Ageing is a major issue in many Asian countries, and Japan is leading among ageing societies. Other countries also have gender role norms as strong as those in Japan. Information sharing on how to support youth and women will continue to be important, and all countries must share this information continuously.

Professor Yukie Hori is Research Director at The Japan Institute for Labour Policy and Training (JILPT). Professor Hori obtained his PhD from Ochanomizu University in Social Science and worked JILPT from 2002. She teaches sociology of education at Chuo University. She has held a number of public offices, including the Central Council on Education, the Social Policy Council, and the Labour Policy Council. Her research interests include the transition school to work and working style of the employment ice age generation. She is also visiting scholar at Australian National University in 2024.

References

Hori, 2023, Youth Employment and Employment Policies in Japan, Japan Labor Issues, Vol.7, No.41, January 2023.

JILPT, 2022, Changes in Work and Consciousness of Youth in Major Urban Areas: From the 5th "Survey on the Working Style of Young People", JILPT Research Report, No.213.

Meeting the Challenges Facing Korean Youth

Randall Jones

Abstract

Despite Korea's extraordinary economic development, young Koreans have considerable anxiety and doubts about their future. The hyper-competitive education system that is the path to a high-ranking university imposes heavy pressure and long hours, including after-school tutoring (*hagwons*). While three-quarters of secondary school graduates advance to tertiary education, many cannot find jobs commensurate with their qualifications in large companies or the public sector. While most young Koreans have high digital skills, having grown up in one of the most digitally connected societies, rapid technological progress and the internationalization of the large business groups (*chaebols*) limit their need for additional employees. The mismatch between the education system and the labour market results in a relatively low employment rate for young people. The financial weakness of young people and the difficulty young women face in combining a career and family prompt many young people to postpone or abandon family formation. This has contributed to the decline in the fertility rate to below 0.7, the lowest in the world. Gender disparities in education have diminished as the share of women who are university graduates is higher than for men, and young women have higher employment rates. However, such advantages are reversed as many women withdraw from the labour force to care for their children. Many of those who later return are employed in non-regular jobs, which tends to be low-paid, precarious jobs. Consequently, the gender wage gap is the second highest among OECD countries at 30%. The government has emphasized the role of vocational education, for example, by introducing Meister schools that have played a key role in Germany. However, the priority attached to university education limits the attractiveness of vocational education. The government is also promoting entrepreneurship education and enhancing financing of new start-ups through venture capital and fintech. Entrepreneurship, though, remains constrained by the still-dominant role of the large business groups, which can limit the prospects for potential entrepreneurs and the preference of most young people to avoid jobs in small enterprises.

Asia's Future Workforce: Shaping Responsive Education and Employment Policies for Youth and Beyond

Korea's transformation from one of the lowest-income countries in the world in the 1950s to the 13th-largest economy in 2023 is exceptional in economic history. Despite Korea's rapid economic development, young Koreans today face considerable challenges and difficulties. The hyper-competitive education system that opens the door to a high-ranking university and successful careers imposes heavy pressure and long hours, including after-school tutoring (*hagwons*). While three-quarters of secondary school graduates advance to tertiary education, many cannot find jobs commensurate with their qualifications. Rapid labour-saving technological progress and the internationalisation of the large business groups (*chaebols*) limit their need for additional employees (Jones, 2018).

The mismatch between the education system and the labour market results in a relatively low employment rate for young people compared to other OECD countries (Figure 1), even as small and medium-sized enterprises (SMEs) face severe labour shortages. The government is promoting entrepreneurship education and enhanced financing of new start-ups through venture capital and fintech. However, entrepreneurship remains constrained by the still-dominant role of the large business groups, which limits prospects for potential entrepreneurs, the lack of second chances for failed entrepreneurs, and the preference of most young people to avoid jobs in small enterprises.

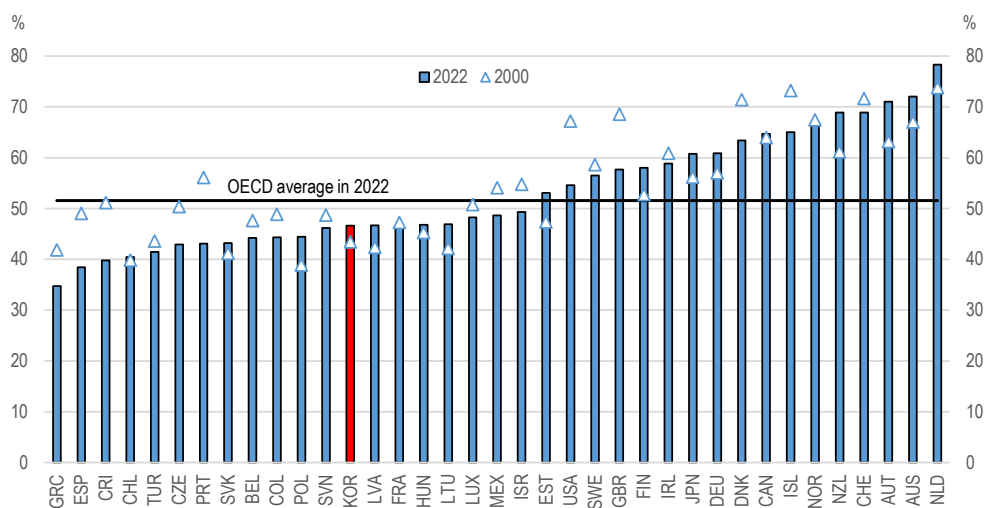


Figure 1. Korea's youth employment rate is below the OECD average

Note: The percentage of employed persons in the 15-29 age group. The OECD average shows the unweighted average of the 38 OECD member countries.

Source: OECD.Stat, "LFS by sex and age", accessed 12 June 2024.

The precarious financial position of young people has increased the share that has delayed or abandoned the goals of marriage and children (the so-called “*sampo* generation”). Consequently, Korea’s fertility rate has fallen below 0.7, the lowest in the world. Significant progress has been made in reducing gender disparities. Indeed, the share of women who are university graduates is higher than for men, and young women have higher employment rates. However, such advantages are reversed as many women withdraw from the labour force to care for their children. Many who return later are employed in non-regular jobs, which tend to be low-paid and precarious. Consequently, the gender wage gap of 31% is the highest among OECD countries.

After a brief overview of government policies to support young people, this paper examines the education system, how it could be reformed to reduce the mismatch between the education system and the labour market, and how to prepare young people to cope with technological change. Labour market dualism, a major cause of low employment for young people and gender inequality, is discussed in the third section. The fourth section analyses the wage and productivity gaps between large firms and SMEs and its impact on youth employment. The role of entrepreneurship is also discussed.

Government policies to improve life for youth

During the past two decades, the government has focused on the challenges facing youth, particularly employment, and other issues such as education, low incomes of young people, and the high cost of housing in the Seoul metropolitan area. Labour market policies include employment subsidies and tax benefits for young workers and their employers and hiring quotas (Jones and Beom, 2022):

- In 2015, the government introduced a tax credit for SMEs for each young person hired as a permanent worker. In addition, SMEs receive 150% tax deductions for increases in wages paid to youth who are permanent employees.
- Income tax exemptions, in-work benefits, and cash benefits aim to bring the net earnings of young workers at SMEs closer to those at large companies.
- Since 2014, the government has required that unemployed youth account for 3% of hiring by public entities, although the net impact on employment is limited as they replace older workers with younger workers.

Identifying the impact of specific programmes is challenging, given the synergic effects of the wide range of policies. The president of the government’s Korea

Labour Institute stated that “there are over 200 job policies in place under different central ministries and local authorities, using up an enormous budget, without providing employment or income solutions that are actually felt by young people”. The goal should be to “reduce the redundancy and inefficiency in the youth employment policies that are instituted in a haphazard fashion” (Kim, 2017).

The race for education credentials creates labour market mismatch

The low youth employment rate is primarily due to a mismatch between the skills demanded by employers and those acquired in education. Korea is well-known for its emphasis on education, which has played a fundamental role in its economic development. More than 80% of teenagers plan to acquire at least a four-year university degree and 90% of parents share that objective (Jones, 2013). In 2023, 73% of high school graduates advanced to college (usually two years) or university (four years), and the share of the 25-34 age group with a tertiary degree (69.3%) was the highest among OECD countries.

An “education bubble” in Korea

According to a former Minister of Education, Korea faces an “education bubble” (Lee et al., 2014). The zeal for education has strengthened credentialism – using academic qualifications as the best indicator of a person’s intelligence and ability to perform a job. Credentialism, in turn, has led to “education inflation”, which requires young people to obtain higher degrees for positions that previously had lower requirements. One outcome is a smaller share of students in two-year colleges, traditionally major vocational education providers, in favour of universities. Former president Lee Myung-bak stated, “Reckless university enrolment has aggravated both the private education burden and youth employment” (Financial Times, 2010).

Admission to a prestigious university depends significantly on access to outstanding high schools and *hagwons*, which prepare students for the College Scholastic Ability Test (CSAT) (Jones, 2023a). About three-quarters of students (primary to upper secondary schools) participated in private after-school education in 2021, with spending reaching 1.2% of GDP. Among OECD countries, Korean students devote the most time to studying in school and after-school educational institutions, reducing the well-being of young people. Indeed, among OECD countries, Korean 15-year-olds had the lowest proportion reporting high life satisfaction and the second-highest proportion reporting low satisfaction

in the 2015 OECD PISA study (Figure 2). Korea is the only OECD country where young people devote less time to leisure and personal care than adults.

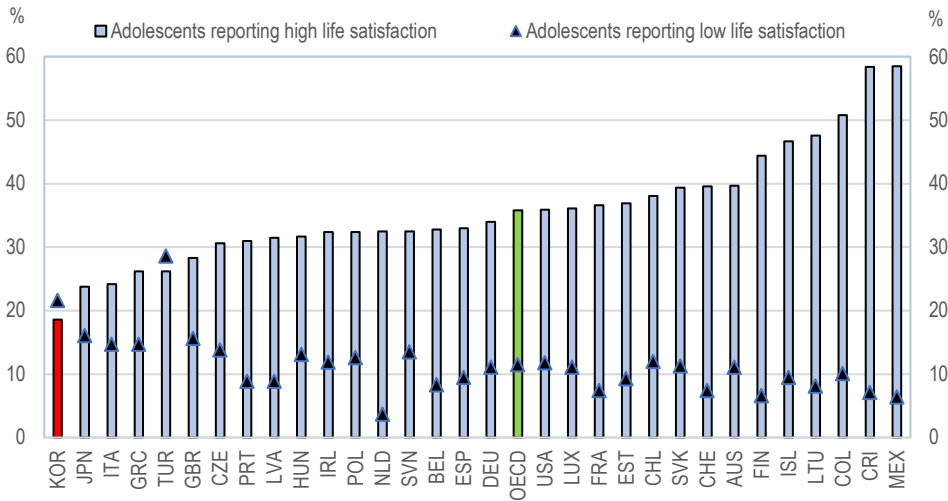


Figure 2. Korean students report low life satisfaction

Source: OECD.Stat, “Children Well Being: Activities and Life Satisfaction”, accessed 5 July 2024.

Another negative consequence of credentialism is the close link between a person’s economic and social status and their educational achievements and the prestige of the university attended (Jones, 2013). Such a link reduces social mobility, given that educational achievements depend increasingly on the socio-economic status of the parents. About half of the students in 2011 at Seoul National University (SNU), Korea’s top-ranked university, were from households with a monthly income exceeding KRW 5 million (one-third above the national average) (H. Kim, 2015). In a survey of teachers and professors the same year, 68% disagreed that “admission into a prestigious school can be granted based on personal skills and hard work, regardless of the family’s economic status”. Among persons in their 20s and 30s, 83% disagreed with that statement (Ryu, 2011). The education gap between different income categories makes education a means for intergenerational transfer of social status rather than upward mobility (H. Kim, 2009). A government survey found that only 27% of the population in 2023 believes they have a high possibility of moving up the social ladder (Figure 3). Moreover, the share that thinks there is a high chance of social mobility between

generations fell from almost half in 2009 to 30% in 2023.

Education and employment

Despite rising education levels, the employment rates for young people were lower in 2023 than in 2000. For young men, the rate fell in each of the four age cohorts shown in Figure 4, Panel A. The employment rates for young women in the 15-19 and 20-24 age groups also declined (Panel B), reflecting the higher share of women continuing their education. However, the rates for women in the 25-29 and 30-34 cohorts have risen more than 20 percentage points since 2000, driven by the trend toward later marriage and childbirth, which has more than offset the factors driving down male employment.

The decline in employment rates for men in the 25-29 age cohort over 2000-23 for those with high school, some college and university education reflects several factors (Figure 5, Panel A). First, the number of new jobs requiring a university education has fallen behind the increase in the number of graduates. Second, the emphasis on higher education has pushed high school graduates to attend university, including those with low employment rates for graduates. In contrast to men, the employment rate for women in the 25-29 age cohort has increased for all levels of education (Panel B), given the trend toward later marriage and childbirth noted above.

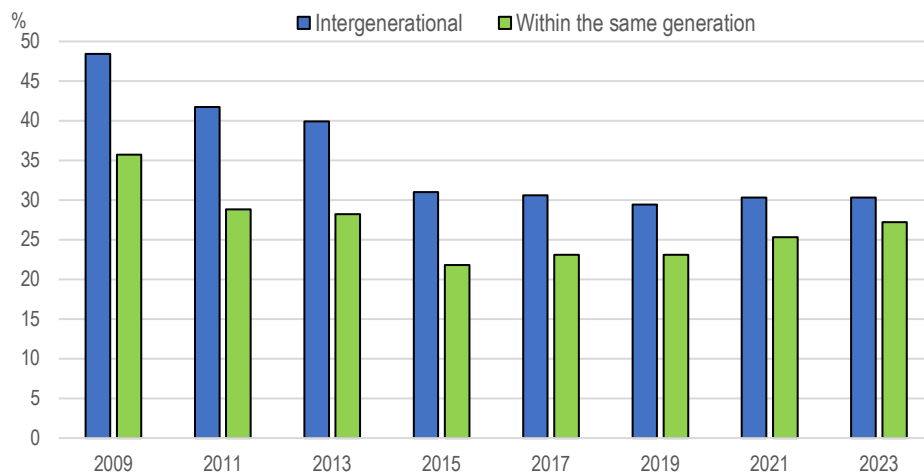


Figure 3. The possibility of upward social mobility is thought to have declined

Note: Answers to a government survey asking if individuals think there is a high possibility of social mobility for their generation and the following generation.

Source: Statistics Korea, *Social Survey*.

In addition to low employment rates, the mismatch between the skills learned in education and those demanded by companies contributes to the high proportion of youth who are not in the labour market. The share of NEETs (neither employed, nor engaged in formal education or training) among youth between the ages of 15 to 29 was 18.4% in 2017, the sixth highest in the OECD. The NEET rate is particularly high among college and university graduates at 45% in Korea compared to 18% in the OECD area (OECD, 2019), while it is relatively low for youth with vocational education and training (Yoo, 2019).

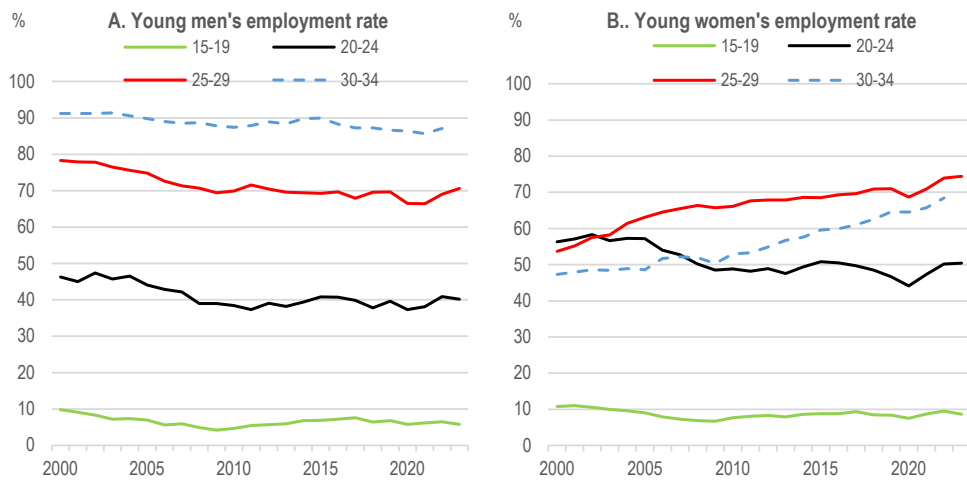


Figure 4. The employment rate for men fell for all age groups between 15 and 34

Source: Statistics Korea, [Summary of economically active pop. by gender/ age group \(kosis.kr\)](https://kosis.kr), accessed on 12 June 2024.

Asia's Future Workforce: Shaping Responsive Education and Employment Policies for Youth and Beyond

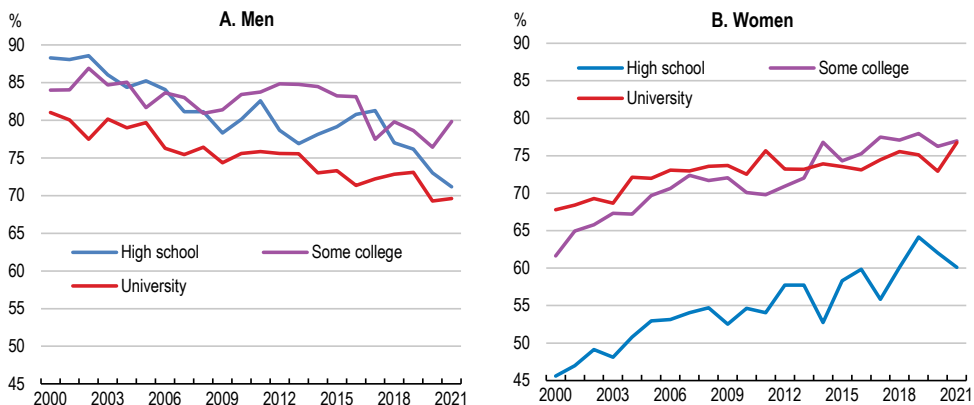


Figure 5. Male employment rates for the 25-29 age group have been falling for all education levels

Note: Percentage of the 25-29 age group that are employed as a share of those who have graduated (those still in school are excluded). High school refers to high school graduates or less. “Some college” are those with less than four years. University refers to graduates of four or five-year universities and graduate work.

Source: OECD (2022), *2022 OECD Economic Survey of Korea*, OECD Publishing, Paris.

Tertiary graduates who initially fail to find a job matching their degree are often reluctant to accept lower-level positions, reflecting high reservation wages and their career expectations. Instead, they often seek to improve their employment chances by pursuing additional education, both formally and informally. A 2017 government survey found that 17% of NEETs were preparing for company entrance exams, 6% were preparing for university entrance exams and 16% were engaged in other informal education (OECD, 2019). However, such training is usually ineffective in increasing wages, productivity and employability (H. Kim, 2015). Another study found that former NEETs have lower employment rates and wages and higher rates of unemployment and economic inactivity. Moreover, the longer the NEET experience, the greater the negative impact (Nam and Kim, 2013), although it may positively affect some young people. Overall, repeated job-seeking delays the transition to the labour market and imposes high opportunity costs, with an adverse impact on the overall economy.

Labour market mismatch also hurts those who are employed. Half of university graduates in Korea are employed in a field unrelated to their field of study, the highest share among the 22 OECD countries for which data are available. On average, college and university graduates spend about nine months searching for a job. Nevertheless, Koreans stayed at their first job for only 1½ years on average

in 2017 and only nine months for the 20-24 age cohort. Almost three out of five young people left their first job because they were dissatisfied with their work conditions or promotion opportunities. In 2015, 44.5% of university graduates and 78.5% of those with post-graduate degrees felt overqualified for their jobs. In contrast, less than 10% of high school graduates felt over-qualified, while one-third reported being underqualified, suggesting weaknesses in vocational high schools (OECD, 2019).

Reforming the education system to reduce mismatch and adapt to technological change

Secondary level

The decline in the employment rate for high school graduates suggests that vocational education at the secondary school level has become less effective in preparing students for the job market in the context of rapid technological changes. High school vocational schools played a vital role in Korea's economic development by providing marketable skills that enabled students to enter the labour market directly after graduation. In 1995, nearly 40% of high school students attended vocational high schools and only 19% of their graduates entered tertiary education. With the increasing focus on tertiary education, the share of high school students attending vocational high schools fell to 18% by 2021, far below the 44% OECD average.

To reverse declining enrolment, the government has emphasised the role of vocational education. In 2010, it introduced Meister schools, which have played a key role in Germany. Meister high schools improve vocational education by combining work experience and education, with the curriculum developed jointly with industry representatives. More than 50 Meister schools have been established and their graduates' employment rates have exceeded 90% (Yu et al., 2020). In 2013, the government created the Work-Study Dual Programme, which allows students to combine study with internships. Around 95% of firms participating in the Programme are SMEs.

However, these initiatives are small in scale, as only 3% of high school students attend Meister schools or participate in apprenticeship programmes, placing Korea at the bottom of OECD countries in this regard (OECD, 2019). The priority attached to university education continues to limit the attractiveness of vocational education, which is crucial, particularly for SMEs facing labour shortages. The employment rate of vocational high school graduates declined from 52% in 2017 to 29% in 2021 (Figure 6). Meanwhile, the share in tertiary education reached 44% and the percentage of NEETs doubled to 26% over 2011-21.

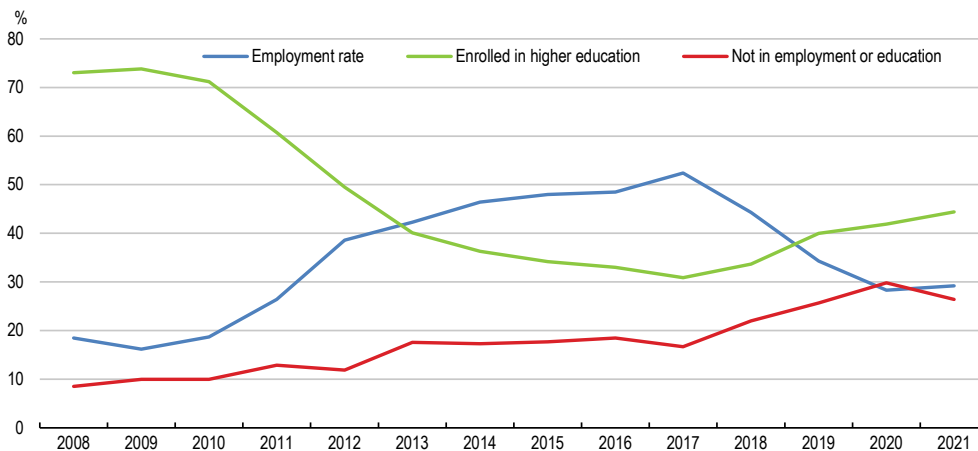


Figure 6. The share of vocational high school graduates moving directly to employment is falling

Source: J. Ahn and S. Kim (2022), "The Career Trends of Vocational High School Graduates and the Relationship with Economic Indicators", *KRIVET Issue Brief*, No.236, Korea Research Institute for Vocational Education and Training, Sejong (in Korean).

Tertiary level

The practice of Korean universities of admitting a strictly fixed number of students per major constraints university students' field-of-study choices. Consequently, the distribution of students by major has remained rigid despite changing demand from employers (Han, 2020a). The lack of flexibility makes it difficult for higher education to keep pace with technological change. For example, the number of students who graduated with a computer science major during 2010-15 increased by 50% in the United States while falling by 5% in Korea. In the Stanford University engineering school, 43% of students enrolled in computer science compared to only 7% in the SNU engineering school (J. Kim, 2017). Another study found that the number of computer science graduates at Stanford increased by more than five-fold during 2008-20, reaching 745 graduates in 2020 compared to a 27% increase at SNU to 70 graduates (Oh, 2020). The failure to increase educational opportunities in emerging technologies has led to a shortage of digital skills in Korea (Korea Herald, 2022).

Making universities more responsive to labour market demands requires allowing them to expand admission to departments related to emerging or expanding industries. More flexibility for students in choosing their major would also reduce mismatch. Students apply for a specific combination of a university and a

department (major). Applicants thus face a trade-off between choosing a major in line with their individual interests or a major in which they can gain admission to a prestigious university. Consequently, many students need to abandon their preferred field of study to enter a highly-ranked university. The result is a deviation from the social optimum that depends on placing the right person in the right major and a less talented workforce (Han, 2020b). Greater flexibility in choosing a major might also reduce the wide variation in employment rates by field of study (Table 1).

Field of study	Engineering	Social sciences	Arts and physical education	Humanities	Natural sciences	Medicine	Education	Total
Students (%)	26.6	25.6	11.2	10.8	10.0	9.6	6.2	100.0
Employment rates (%)	71.7	64.2	64.2	57.1	64.2	83.3	64.1	67.7

Table 1. Employment rates vary widely by field of study

Note: Employment rates are for 2018 and the share of students by field is for 2021.

Source: Korea Educational Development Institute.

Finally, it is difficult for enrolled students to change their field of study, resulting in a mismatch as students discover new abilities and interests. The distribution of bachelor's degrees conferred by four-year universities is very similar to that of first-year students by department (with a four-year time lag). Opportunities to change majors by transferring to other departments or universities are very limited (Han, 2020a). A 2018 survey found that 28.2% of students wanted to change their field of study. A relatively large share of students who had chosen their field of study by seeking to gain admission to a prestigious university or by following classmates regretted their choice (37% and 46%, respectively),

compared to only 15% of students who chose their field of study based on their personal interests (Han, 2020b).

Why is enrolment in higher education strong despite the mismatch problem? Hoping for a golden ticket

The comparatively high share of tertiary graduates in Korea is not driven by the financial returns to education, given that the large number of graduates deflates the value of their degrees and earning prospects. The wage premium for tertiary graduates relative to high school graduates was 20% in 2019, about half of the OECD average (Jones and Beom, 2022). In fact, 29% of college and 18% of university graduates earned less than the average earnings of high school graduates in 2017 (OECD, 2019). Higher education thus does not ensure higher wages and can result in lower youth employment. Indeed, students who move directly from vocational secondary education to the labour market have better outcomes on average than those who enter tertiary education (Choi, 2021). Consequently, the average financial return to tertiary education in Korea, taking into account tuition fees and foregone earnings while in school, is relatively low (Figure 7) and even negative for a substantial share of university and college graduates. Tuition fees for bachelor's programmes at public institutions in Korea are the eighth-highest among the 27 countries with available data (OECD, 2021a). Moreover, four-fifths of students attend private universities, where tuition is 77% higher than in public universities (Han, 2020a).

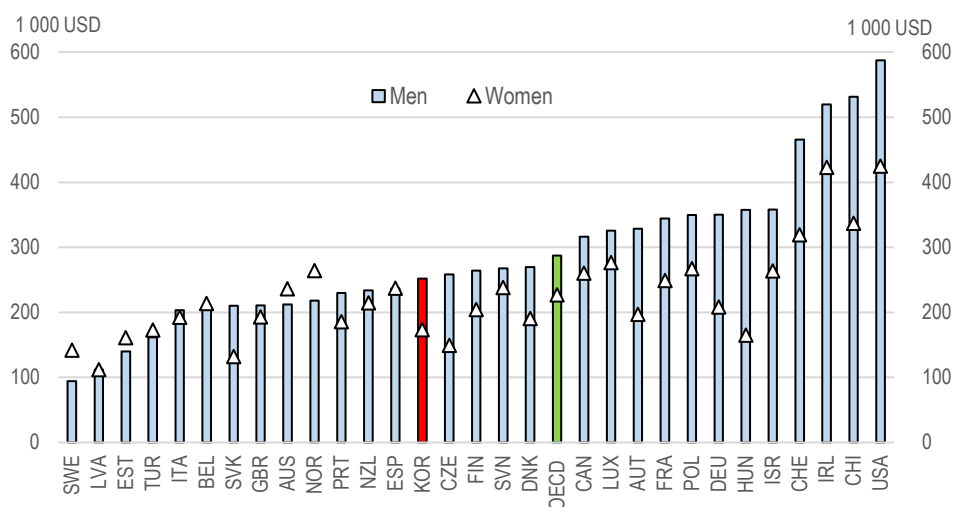


Figure 7. Financial returns to tertiary education are relatively low

The net lifetime benefits of attaining a tertiary education compared to a high school education

Note: Future costs and benefits are discounted at a rate of 2%. In USD converted using PPPs for GDP.

Source: OECD (2021a), [Education at a Glance 2021: OECD Indicators](#), OECD Publishing, Paris.

Young people and their parents thus invest significant time and money in educational qualifications that provide meagre rewards by international standards in hopes of winning a “golden ticket” -- obtaining regular (i.e., permanent) employment in large firms or the public sector. The mismatch in young people’s educational and career aspirations and the demands of employers is driven by the polarisation of the Korean economy. A government report stated, “It is difficult to expand youth employment and improve the quality of jobs due to changes in the industrial structure and the dualistic structure of the labour market such as regular jobs versus non-regular jobs and large enterprises versus small firms” (OGPC, 2020). While educational reform is essential, to be fully effective, it must be accompanied by measures to break down labour market dualism and narrow the productivity gap between large firms and SMEs. Such measures would encourage young people to accept available employment rather than queueing for jobs in large firms and the public sector. These two issues are discussed below.

Breaking down labour market dualism to boost youth employment and reduce gender inequality

Dualism is deeply entrenched in Korea's labour market. Regular workers benefit from relatively high wages and social insurance coverage (notably pensions, health and unemployment) and robust employment protection. Non-regular workers, which include fixed-term, part-time and atypical workers, receive lower wages, are less likely to be enrolled in social insurance programmes and typically work in precarious jobs. Non-regular workers face many other disadvantages; 21% receive company bonus payments in 2021 compared to 62% of regular workers and relatively few are enrolled in company pension systems. Less than 1% are members of labour unions.

Among employees in the 15-29 age group, the share of non-regular workers rose from 31.8% in 2003 to 35.2% in 2018 (Figure 8). A broadening of the definition of fixed-term workers boosted the share to 40.4% in 2019 and it climbed further to 42.6% in 2023, the highest of any age group except older persons. Among employees of all ages, two-thirds of non-regular workers are fixed-term, boosting the share of temporary employment to 27% in 2022, more than double the 11% OECD average.

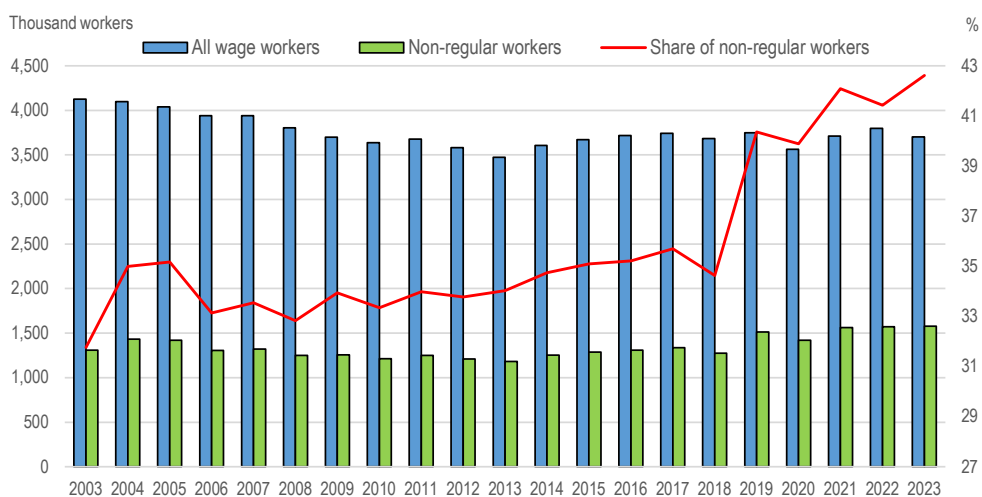


Figure 8. The number and share of non-regular workers among young people is high and rising

Note: For the 15-29 age group. Non-regular workers are defined as fixed-term (i.e., non-permanent), part-time and non-typical workers (including on-call, contingent and subcontracted workers). Given the revision in the definition of part-time workers in 2018, the data for 2019-23 should not be compared to previous years.

Source: Statistics Korea, “Supplementary Results of the Economically Active Population Survey by Employment Type”.

The link between non-regular employment and education

The incidence of non-regular employment is higher for youth without tertiary education. In 2017, more than 60% of high school graduates were employed as regular workers compared to 28% of those with at least a college degree (Figure 9, Panel A). The higher share of regular employees for those with tertiary education contributes to their higher incomes. In 2017, 38% of university graduates were in the highest income quartile, while only 12% were in the lowest quartile (Panel B). In contrast, nearly one-half of high school graduates were in the lowest quartile.

The disadvantages facing non-regular employees and the limited opportunities to advance from non-regular to regular employment in Korea’s segmented labour market are key factors motivating young people to seek higher education in an effort to secure regular employment (Jones, 2023b). Non-regular jobs are often traps that keep workers in low-quality jobs rather than providing stepping stones to regular employment (OECD, 2016). Indeed, the transition rate from non-regular to regular jobs has been falling (H. Kim, 2015). Temporary and parttime

Asia's Future Workforce: Shaping Responsive Education and Employment Policies for Youth and Beyond

workers in Korea are less likely to move to a regular job during the following year than unemployed people with similar characteristics (OECD, 2016), reflecting the stigma attached to non-regular employment. The segmentation between regular and non-regular jobs thus tends to entrench the initial conditions of workers' entry into the labour market (Han, 2018). The transition from non-regular to regular jobs is most likely for highly-educated workers with longer tenure in unionised (typically large) firms, thus reinforcing the emphasis on education (Ha and Lee, 2013).

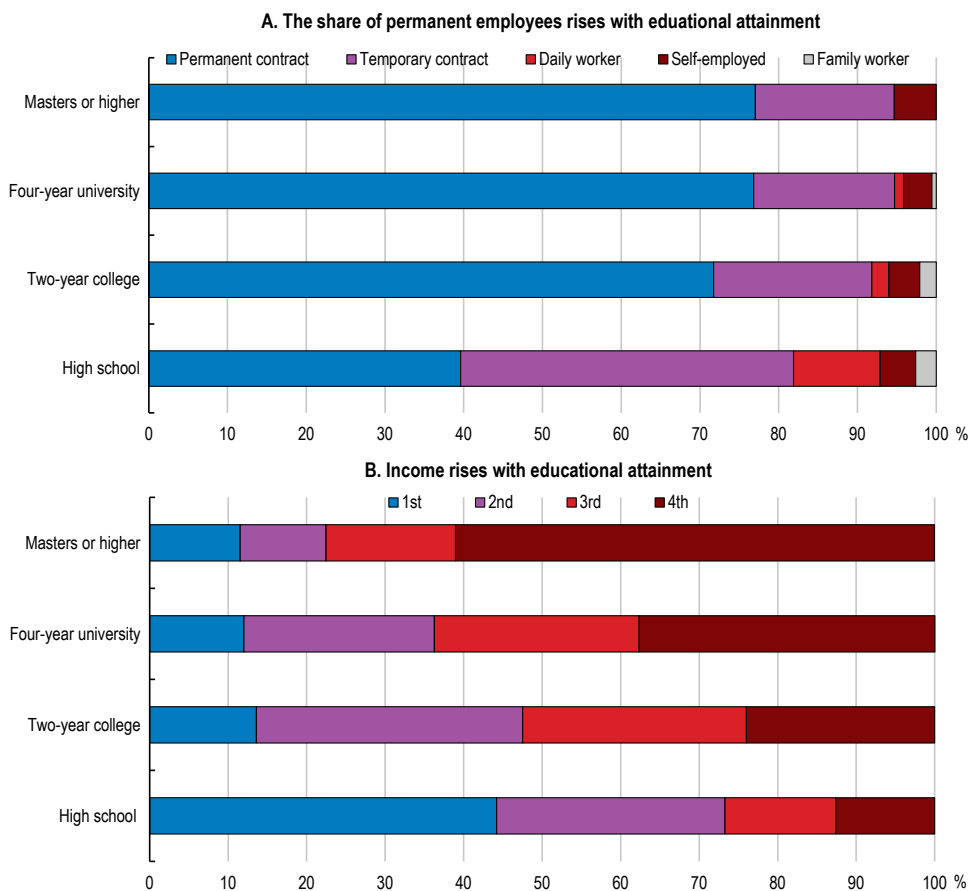


Figure 9. Tertiary education increases the chance of regular employment and higher wages

Note: For the 15-29 age group in 2017. The share of graduates at each level by employment status and income quartile. The “less than high school” category is excluded because of the small number of observations. Each income quartile in Panel B represents approximately 25% of employed youth.

Source: OECD (2019), *Investing in Youth*, OECD Publishing, Paris.

Labour market dualism has other adverse effects, notably on gender equality and worker training

The significant wage gap between regular and non-regular workers is a fundamental source of income inequality and poverty in Korea. Moreover, it has equity implications for future generations, as education spending in households of non-regular workers is only about half of that in regular worker households (Jones and Beom, 2022). Moreover, 46% of female employees (all ages) were non-regular workers compared to 30% of men in 2023. Dualism is thus a major source of Korea's gender wage gap, the highest among OECD countries (Figure 10). It also limits the share of employed women in managerial positions to 0.3%, the lowest in the OECD (Figure 11, Panel A). Women accounted for 12% of the seats on boards of the largest publicly-listed companies in 2022 compared to the 30% OECD average.

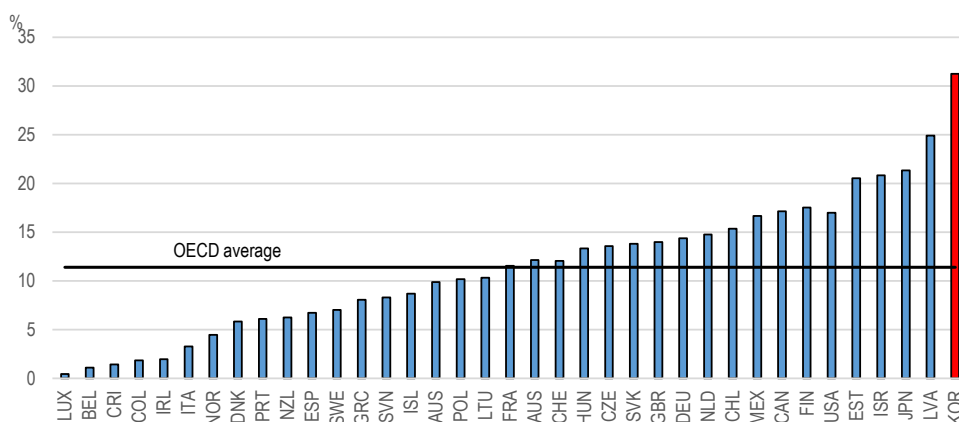


Figure 10. Korea has the largest gender wage gap among OECD countries

Note: The gender wage gap is the difference between the median earnings of men and women relative to the median earnings of men. This indicator is measured as a percentage of the median earnings of men.

Source: OECD Data Explorer, "Gender Wage Gap", accessed 5 July 2024.

Asia's Future Workforce: Shaping Responsive Education and Employment Policies for Youth and Beyond

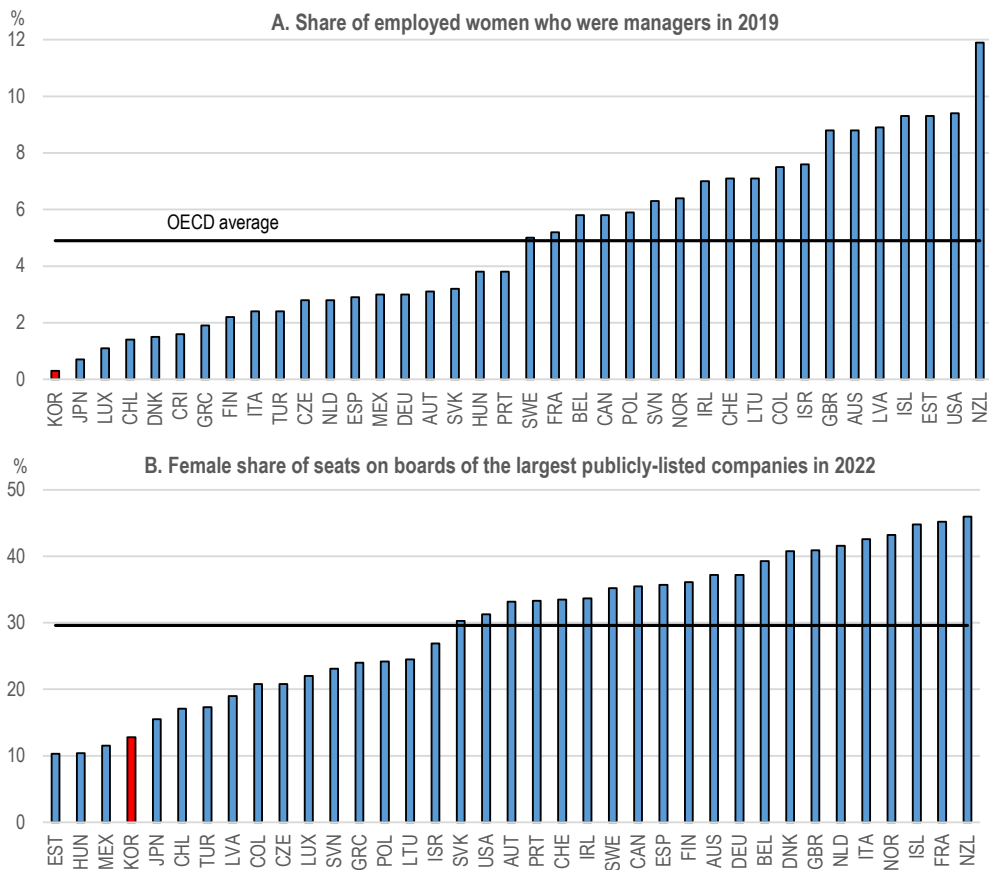


Figure 11. Women’s share of management and corporate boards is among the lowest in the OECD

Source: OECD Data Explorer, “Share of employed who are managers, by sex” and “Female share of seats on boards of the largest publicly listed companies”, accessed on 5 July 2024.

Labour market dualism hurts economic growth. The high share of fixed-term workers discourages firm-based training, negatively affecting productivity. Non-regular workers receive only 1.8% of the training opportunities provided by employers (Yun, 2016). Moreover, government spending on worker training, at 0.09% of GDP in 2021, is slightly below the OECD average. Dualism also encourages companies to rely on low-wage workers rather than invest in innovative technology (Schauer, 2018). Finally, labour market dualism depresses output growth by reducing labour force participation among groups where non-regular employment is high, notably young people, women and older persons.

Breaking down labour market dualism is a priority in Korea, in part to remove the negative implications for youth employment. It requires addressing the underlying factors that encourage firms to employ non-regular workers. This calls for a comprehensive strategy of relaxing employment protection for regular workers and making it more transparent while increasing enrolment in social insurance and training for non-regular workers. Other labour market policies would promote youth employment:

- Korea's minimum wage rose sharply from 43% of the median wage of full-time regular workers in 2012 to 61% in 2022. Lowering the minimum wage relative to the median is crucial to avoid pricing lesser-skilled young people out of the job market.
- Unemployment insurance benefits should be reduced. Benefit recipients who take a job paying the minimum wage face a "participation tax rate" that was the highest in the OECD in 2021 at 110%, indicating that taking a job reduced their income. The negative effect on employment is most severe for young people, given their lower wages on average (OECD, 2022).

Making SMEs and start-ups a driver of growth and jobs to reduce product market dualism

Employment policies for young people "are rarely effective because they cannot go to the heart of the problem, which is creating decent jobs in the private sector" (S. Kim, 2017). Job creation increasingly depends on SMEs. By 2016, SMEs (firms with less than 300 employees) accounted for 85% of employment in Korea, compared to around half in Japan and the United Kingdom and an average of 69% in the OECD (OECD, 2023). If large firms do increase employment, they tend to hire experienced workers rather than new graduates, given uncertainty about their skills. Productivity in Korean SMEs is only a third of that in large firms in contrast to the OECD average of more than half (Figure 12).

Asia's Future Workforce: Shaping Responsive Education and Employment Policies for Youth and Beyond

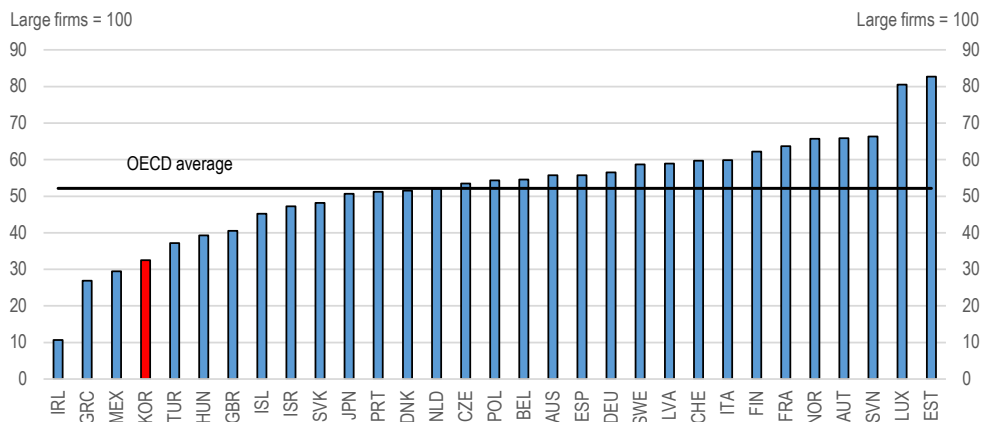


Figure 12. The productivity gap between SMEs and large firms in Korea is wide
Value added per employee in SMEs relative to large firms in 2015 or latest year

Source: OECD (2018), *2018 OECD Economic Survey of Korea*, OECD Publishing, Paris.

In addition to holding back economic growth, the large productivity gap increases wage inequality. Firms with at least 300 employees pay young workers 50% higher wages than those with less than ten (Figure 13). The gap widens to 140% among workers in the 55 to 64 age group. Low productivity makes it problematic for SMEs to offer well-paid regular jobs. Consequently, the proportion of non-regular workers was 48% at companies with less than five workers, 32% at those with five to 300, and 14% at those with more than 300 (OECD, 2016).

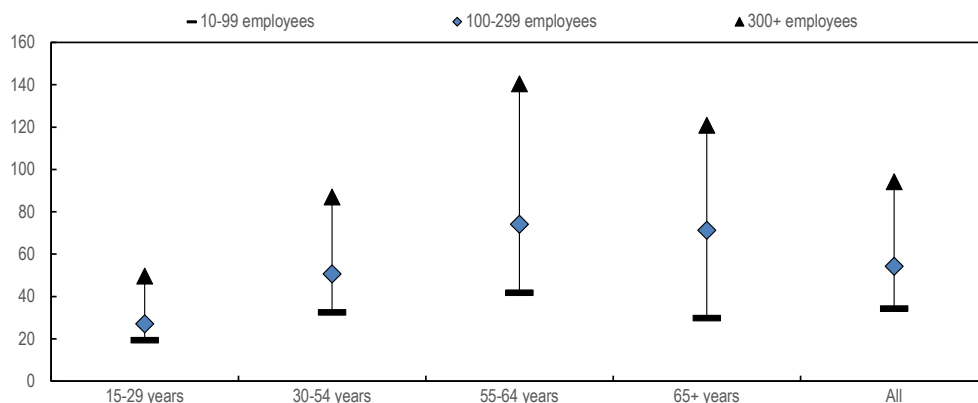


Figure 13. The wage premium paid by large firms in Korea is substantial
Percentage difference in wages in large firms compared to firms with less than ten employees (2017)

Note: The sample includes full-time employees only, defined as those working 30 hours or more per week.

Source: OECD (2019), *Investing in Youth: Korea*, OECD Publishing, Paris.

Only 4% of young people (aged 13 to 34) want to work in an SME, given the low wages, according to a 2021 government survey (Figure 14, Panel A). Instead, nearly two-thirds hope to work at large firms, public companies or government agencies. The probability of employment at a large company rises with educational attainment, stimulating the drive for higher education. In 2017, 38% of workers with at least a master's degree were employed in firms with at least 300 workers, compared to 10% and 6% for college and high school graduates, respectively (Panel B). In contrast, 86% of high school graduates were employed in companies with fewer than 100 workers. Tertiary graduates who initially fail to obtain jobs in large firms or the public sector tend to queue for such jobs rather than fill labour shortages at SMEs (Jones, 2023b).

Asia's Future Workforce: Shaping Responsive Education and Employment Policies for Youth and Beyond

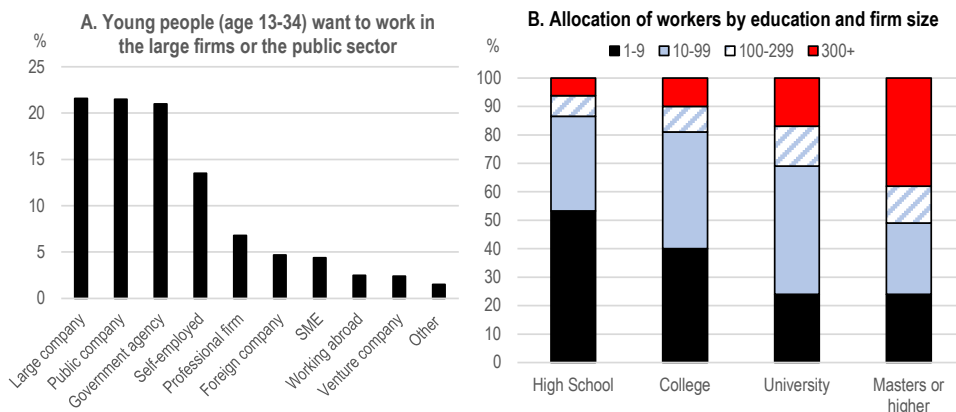


Figure 14. Education increases the chances of getting hired by large firms

Source: Statistics Korea, 2021 Social Survey; OECD (2019), *Investing in Youth: Korea*, OECD Publishing, Paris.

Policies to enhance the productivity of SMEs

A wide range of policies are needed to increase SME productivity (Jones and Beom, 2022):

- *Innovation*: Although Korea is a global leader in digital technology and infrastructure, small firms have limited capacity to invest in new technologies, such as cloud computing, big data, and AI. Overcoming the obstacles to such investment, notably inadequate funding and a lack of human resources, is essential.
- *Rationalise public support policies*: Korea provides a high level of support to SMEs relative to the OECD average. Around 43% of SMEs in Korea receive government support (OECD, 2021b). Studies have found that government support for SMEs lowers recipient firms' productivity and increases the survival rate of incompetent ones (Chang, 2016a; Chang, 2016b).
- *Enhance access to financing*: SMEs rely primarily on bank loans that are guaranteed by collateral, typically real estate, or the government. Firm failure imposes heavy burdens on SME owners and limits second chances. Further development of venture capital would help overcome such obstacles.
- *Regulatory reform*: In the OECD's 2018 product market regulation index, Korea's regulations were the sixth-most stringent among OECD countries.

Moreover, regulations impinge more heavily on services, with negative consequences for SMEs, given their concentration in that sector.

- *Competition from firms in the large business groups (chaebols):* The concentration of economic power stifles firm creation and the growth of small firms. Improving corporate governance and preventing unfair subcontracting practices by large firms would benefit SMEs (Jones, 2018).
- *Expand training opportunities:* In 2015, only 43% of small firms provided non-mandatory training, compared to 53% of medium-sized firms and 64% of large firms. The lack of time for employees and the financial costs are the major constraints on training in smaller companies.

Measures to encourage entrepreneurship to boost the number of innovative start-ups

A study that ranked firms by their employment growth found that the top 15% increased their youth employment by 270,000 over 2014-17, while the bottom 35% of firms reduced it by 588,000 (Yoon et al, 2019). Firms in the top 15% stood out in several respects: i) they were relatively small, with an average of fewer than five employees in 2014; ii) they were relatively young; and iii) their R&D spending increased extremely rapidly, while that in the bottom 35% declined. Small, innovative firms are thus a key driver of youth employment.

Entrepreneurship is crucial to increasing the number of new firms. Koreans rank above the OECD average in the Global Entrepreneurship Monitor survey regarding their interest in starting a company and average in terms of their perceived capabilities as entrepreneurs (Figure 15). However, they rank relatively low in the perceived ease of starting a business, opportunities for starting a business, and the percentage that knows an entrepreneur. Promoting female entrepreneurs is a priority, given that the gender gap in entrepreneurship in Korea was the third highest in the OECD in 2016 (OECD, 2018). The government is promoting entrepreneurship education and enhancing financing of new start-ups through venture capital and fintech. Nevertheless, entrepreneurship remains constrained by the reliance on banks for financing and the lack of second chances for failed entrepreneurs. Moreover, the still-dominant role of the large business groups, which limits the prospects for entrepreneurship, and the preference of young people to avoid jobs in small enterprises reduces the scope for firm creation.

Asia's Future Workforce: Shaping Responsive Education and Employment Policies for Youth and Beyond

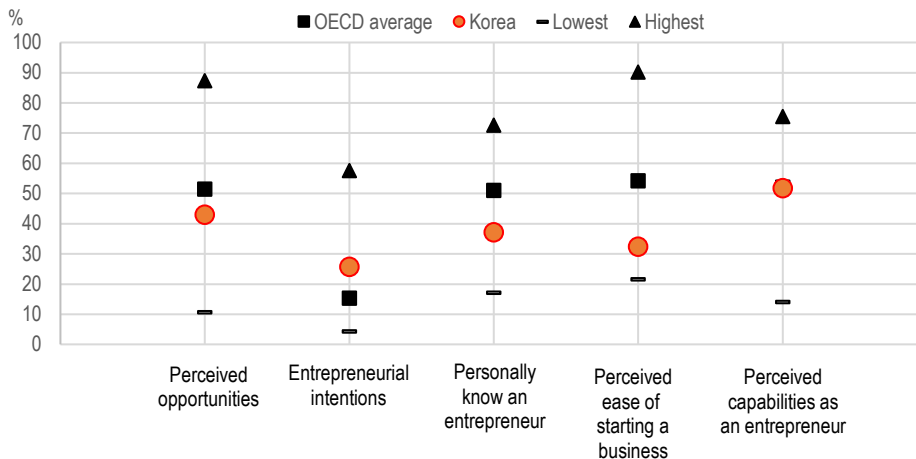


Figure 15. Koreans' attitudes toward entrepreneurship show scope for improvement

Note: The figure is based on 25 OECD countries included in the survey.

Source: GEM (2020), Global Entrepreneurship Monitor 2019/2020 Global Report, London Business School, GEM Global Entrepreneurship Monitor (gemconsortium.org).

Conclusion

Although young Koreans' standard of living is far above that of their grandparents, they face many challenges. The intense focus on academic achievement imposes long hours and stress on children from a young age as they try to win a golden card that will lead to jobs in large companies or the public sector. While more than three-quarters of secondary school graduates advance to tertiary education, the number of jobs commensurate with higher education has not kept pace, resulting in low employment rates and high inactivity rates, especially for young men. While young women have higher employment rates than young men, the difficulty of combining careers and children lead to the withdrawal of many women from the labour force. The prevalence of non-regular employment, which typically offers low wages and precarious jobs, results in a large gender wage gap. The challenges facing young people have prompted many to postpone or abandon marriage and family formation, reducing the total fertility rate to the lowest in the world.

Improving the prospects of young people should begin with education reform. Creating avenues to career success that do not require attending university

would allow the education system to focus on building human capital rather than gaining admission to high-ranking universities. Such reforms would encourage young people to focus on their interests and talents and make entrepreneurship more attractive. To be fully effective, reform of the educational system must be accompanied by policies to break down labour market dualism and raise SME productivity and wages. Such reforms would broaden the choice of career options beyond large companies and the public sector. Moreover, it would reduce income inequality and the gender wage gap.

Dr. Randall Jones received the Decoration of the Order of the Rising Sun from the Government of Japan in 2016 and the Sungnye Medal of the Order of Diplomatic Service Merit from the Government of Korea in 2018. Currently, Dr. Jones is a professional fellow at Columbia University's Center on Japanese Economy and Business, a non-resident distinguished fellow at the Korea Economic Institute and an adjunct lecturer at the Johns Hopkins School of Advanced International Studies. Previously, he was a visiting scholar at Columbia University in 2019-20. Dr. Jones served as the Senior Counsellor for East Asia and as Head of the Japan/Korea Desk at the Organization for Economic Cooperation and Development (OECD) in Paris from 2002 until 2019. During his 30 years at the OECD, Dr. Jones wrote all 16 OECD Economic Surveys of Korea and 15 OECD Economic Surveys of Japan, in addition to a number of other publications. Before joining the OECD in 1989, he spent three years in the US government, serving at the Council of Economic Advisers in the Executive Office of the President (1984-85), and as an advisor in the US State Department (1987-89). Dr. Jones was also the vice-president of the Japan Economic Institute in Washington (1985-87). Dr. Jones received a B.A. in Economics from Brigham Young University and a PhD in Economics from the University of Michigan in 1984. He lived in Korea from 1974 to 1976 and in Japan during 1982-83.

References

- Ahn, J. and S. Kim (2022), "The Career Trends of Vocational High School Graduates and the Relationship with Economic Indicators", *KRIVET Issue Brief*, No.236, Korea Research Institute for Vocational Education and Training, Sejong (in Korean).
- Chang, W. (2016a), "Is Korea's Public Funding for SMEs Achieving its Intended Goals?", *KDI Focus*, No. 63, Korea Development Institute, Sejong.
- Chang, W. (2016b), "Performance Evaluation and Improvement Direction of Financial Support for Start-up Small and Medium Businesses: Focusing on Policy Finance", *KDI Working Paper*, Korea Development Institute, Sejong (in Korean).
- Financial Times (2010), "S Korea faces problem of 'over-education' ", *S Korea faces problem of 'over-education' (ft.com)*, 10 June.
- JoongAng Daily (2021), *Lack of foreign laborers leaves manufacturers shorthanded (joins.com)*, 13 October.
- Ha, B. and S. Lee (2013), "Dual Dimensions of Non-regular Work and SMEs in the Republic of Korea", *ILO Employment Working Paper*, No. 148, Geneva.
- Han, J. (2018), "Long-Term Effects of Labour Market Entry Conditions: The Case of Korea," *Global Economic Review*, Vol. 47, No.4, DOI: 10.1080/1226508X.2018.1512417.
- Han, J. (2020a), "College Majors in Limited Supply: The Case of Private Universities in Korea", *The Korean Economic Review*, Summer.
- Han, J. (2020b), "Mismatches in the Labor Market for College Graduates: Focusing on Field-of-Study Choice", *KDI Focus*, No. 99, Korea Development Institute, Sejong.
- International Monetary Fund (2018), "Youth Un(employment) in Korea – Recent Trends and Drivers", Republic of Korea: Selected Issues, *IMF Staff Country Reports*, 2018(041), Washington DC.
- Jones, R. (2013), "Education Reform in Korea", *OECD Economics Department Working Papers*, No. 1067, OECD Publishing, Paris.
- Jones, R. (2018), "Reforming the large business groups to promote productivity and inclusion in Korea", *OECD Economics Department Working Papers*, No. 1509, OECD Publishing, Paris.
- Jones, R. and J. Beom (2022), "Policies to increase youth employment in Korea", *OECD Economics Department Working Papers*, No. 1740, OECD Publishing, Paris.

Jones, R. (2023a), [Low Youth Employment in Korea Part 1: The “Golden Ticket Syndrome” - Korea Economic Institute of America \(keia.org\)](#), Korea Economic Institute, January.

Jones, R. (2023b), [Low Youth Employment in Korea Part 2: The Challenges of Labor and Product Market Dualism - Korea Economic Institute of America \(keia.org\)](#), Korea Economic Institute, January.

JoongAng Daily (2021), [Lack of foreign laborers leaves manufacturers shorthanded \(joins.com\)](#), 13 October.

Kim, Hisam (2009), “Analysis on Intergenerational Economic Mobility in Korea”, *KDI Policy Study*, 2009- 03, Korea Development Institute, Sejong.

Kim, H. (2015), “[Resetting Education Policy to Restore Social Mobility](#)”, *KDI Focus*, No. 54, Korea Development Institute, Sejong.

Kim, J. (2017), “Inclusive Growth: Challenges and Opportunities”, *2017 KDI Journal of Economic Policy Conference*, 15 December, Sejong

Kim, S. (2017), “[Overview: Employment and Labor Policies in Transition](#)”, *KLI Working Paper*, 2017-07, Korea Labor Institute, Sejong.

Korea Herald (2022), [Korea ‘suffers digital skill shortage’ \(koreaherald.com\)](#), 22 March.

Lee, J., H. Jeong and S. Hong (2014), “[Education Bubble Formation and Its Labor Market Evidence](#)”, *KDI School of Public Policy and Management Paper*, No. 14-03, Sejong.

Kim, S. (2017), “[Overview: Employment and Labor Policies in Transition](#)”, *KLI Working Paper*, 2017-07, Korea Labor Institute, Sejong

Nam, J. and S. Kim (2013), “[Korean NEETs: Characteristics and Labor Market Performance](#)”, *Korea Labor Institute Research Projects*, No. 535, Korea Labor Institute, Sejong (in Korean).

OECD (2016), [OECD Economic Survey of Korea 2016](#), OECD Publishing, Paris.

OECD (2018), [OECD Economic Survey of Korea 2018](#), OECD Publishing, Paris.

OECD (2019), [Investing in Youth: Korea](#), OECD Publishing, Paris.

OECD (2021a), [Education at a Glance 2021: OECD Indicators](#), OECD Publishing, Paris.

Asia's Future Workforce: Shaping Responsive Education and Employment Policies for Youth and Beyond

OECD (2021b), *OECD SME and Entrepreneurship Outlook 2021*, OECD Publishing, Paris.

OECD (2022), *OECD Economic Survey of Korea 2022*, OECD Publishing, Paris.

OECD (2023), *OECD SME and Entrepreneurship Outlook 2023*, OECD Publishing, Paris, <https://doi.org/10.1787/342b8564-en>.

Office for Government Policy Cooperation (OGPC) (2020), "*Second Youth Policy Coordination Committee*", Press Release, (in Korean), 23 December.

Oh, J. (2020), "The Number of Computer Science Graduates at Stanford Increased by More than Five Times in Ten Years, Compared to an Increase of 15 Students at Seoul National University over 16 Years", *Seoul Economic Daily*, 25 November (in Korean).

Ryu, B. (2011), "Measures to Expand Education Opportunities and Social Engagement for the Low-income Class", *Education Development*, Vol. 38, No. 1.

Schauer, J. (2018), "*Labor Market Duality in Korea*", *IMF Working Paper*, No. WP/18/126, International Monetary Fund, Washington DC.

Yoo, S. (2019), "*Characterization and Cost Estimates of Youth NEETs and Policy Implications*", *KERI Insight*, 19-12, Korea Economic Research Institute, Seoul.

Yoon, Y., H. Bang and Y. Nho (2019), "*Innovative SMEs and Job Creation for Youth*", *Korea Labor Institute Working Paper*, 2019-03, Sejong.

Yu, J., S. Kim, H. Yoon, M. Lee and H. Kwon (2020), *Meister High School System in Korea 2020*, Korea Research Institute for Vocational Education and Training, Sejong

Yun, H. (2016), "*Implications of the Performance Evaluation of the Job Creation Project*", *KDI Focus*, No. 73, Korea Development Institute, Sejong.

Employment Opportunities and Labor Risks for Taiwanese Youth under Current Technological Changes

Dr. Lee Chien-Hung

Abstract

As technologies advance toward the global trend of Industry 4.0, the Taiwanese government launched its Productivity 4.0 Initiative in 2015, encouraging Taiwanese industries to move towards digital transformation through the adoption of digital technologies, including Artificial Intelligence (AI), the Internet of Things (IoT), and big data analysis. In this article, the author examines the potential implications of such development on Taiwanese youth employment opportunities and labor risks. The first section explains digital transformation trends in Taiwanese industries, how these trends affect the Taiwanese labor market, and talent demand and shortage in emerging job categories. The second section looks into how digital transformation affects the employment opportunities of Taiwanese youth, particularly on the employment structure and labor force characteristics of young people in Taiwan and job opportunities arising from AI and Human-Robot Collaboration (HRC). The third section investigates the labor risks facing Taiwanese youth under digital transformation, such as technological unemployment caused by AI and technological unemployment and job pivoting caused by HRC. The final section concludes the article by presenting recommendations on employment for Taiwanese youth in the face of digital transformation.

Introduction

In 2013, the German Federal Government included Industry 4.0 in its “Action Plan High-Tech Strategy 2020”¹ in a bid to enhance the digitalization and smart transformation of the manufacturing industry, making Germany the first

1 Chien Shao-chi. (2019). “The Enlightenment of Germany’s Current Economic Development and Strategies to Taiwan,” *Economic Research*, Vol. 19, page 276.

government in the world to promote Industry 4.0 and relevant plans. Soon after, governments around the world started to launch manufacturing transformation plans similar to Industry 4.0, including the re-industrialization policies in the US, the Human+Machine approach in Japan, and the smart factory policies and practices in South Korea.

Following this trend, Taiwan's Executive Yuan also launched The Taiwan Productivity 4.0 Initiative in 2015, which became the starting point for the Taiwanese government to promote digital transformation in different industries.² In terms of talent development, the main goal of this initiative is to cultivate specific talents needed for the implementation of "Productivity 4.0," with specific strategies including: 1) strengthening the cooperation between universities, vocational schools, and the industry by developing "Productivity 4.0" course modules and thereby training students to become practical talents, and 2) offering "Productivity 4.0" on-the-job training courses to enhance the skills of workers on the front-line. In 2018, the Executive Yuan continued to implement the four-year "Taiwan AI Action Plan" and one of its goals is to cultivate more AI talents to meet the industry's increasing demand for tech talents and emerging job opportunities in the future.³

In January 2023, the Executive Yuan further approved "Taiwan AI Action Plan 2.0," which not only seeks to continuously invest in the development of talents, data, computing power, applications, and other aspects of the AI industry, but will also focus on Taiwan's semiconductor advantages and the development of generative AI. According to the 2023 World Digital Competitiveness Ranking released by Switzerland's Lausanne International Institute for Management Development (IMD), Taiwan ranks 9th among 64 major world economies, which is two places higher compared to the rank of 11th in 2022. It is also noteworthy that Taiwan garners first place in five indicators, including 1) the use of big data and analytics, 2) the agility of companies, 3) total R&D personnel per capita, 4) IT & media stock market capitalization, and 5) mobile broadband subscribers.⁴

2 Board of Science and Technology, Executive Yuan. (2015). "Executive Yuan Productivity 4.0 Initiative," *Taiwan Economic Forum*, Vol. 13, No. 3, page 48.

3 Huang Tian-you. (2020). "Investigation on the Impact of the Introduction of Artificial Intelligence (AI) Technology on Labor Laws in the Financial Services Industry" (a report commissioned by the Ministry of Labor), page 114.

4 Su Szu-yun. (2023). "Taiwan Ranks 9th in IMD's World Digital Competitiveness Ranking, with Five Indicators Including 5G User Share Taking Lead Globally," Central News Agency, November 30, 2023.

The Taiwan Productivity 4.0 Initiative's main goal is to build "common technologies" and "soft- and hardware tools" required for industrial transformation in a bid to promote local enterprises' innovative applications in "smart manufacturing." Such technologies include AIoT (Artificial Intelligence of Things), big data, cloud computing, etc. By definition, smart manufacturing refers to fully-integrated, collaborative manufacturing systems that take advantage of the large amount of data collected through numerous sensors. The data will then be processed with technologies such as big data, AI, and machine learning analyses/algorithms to build the "HRC (Human-Robot Collaboration)" system which will improve the overall production process and help enterprises to better satisfy consumer needs and respond to market changes more quickly.

Under the trend of digital transformation, "AIoT (Artificial Intelligence of Things)" and "HRC (Human-Robot Collaboration)" have become the new production model, whose main feature is: Through the integration of automated robots, a large amount of data are collected by various sensors and then integrated into the AIoT network to improve production efficiency. The adoption of the AIoT+HRC production model can bring many positive benefits to an enterprise's business model, including rapid access to global information which transcends the limits of time and space. Such benefits will allow enterprises to re-define the distinction between customers and workers, and thereby create new supply chains and business models to significantly improve production efficiency and flexibility. These emerging business models can all significantly reduce corporate costs and improve business performance.⁵

Although the changes in industrial structure brought about by digital transformation have created more flexible business models and production modes, and new employment opportunities for some workers, such changes have also brought new challenges to other workers who are at risk of unemployment or job transfer. The following discussion of this report will seek to explain the possible employment opportunities and labor risks for Taiwanese youth under the trend of digital transformation, with the first section focusing on the trend of Taiwan's industry promoting digital transformation and how it may impact the demand of human resources in emerging occupation categories.

5 Lin Chia-ho. (2018). "Labor 4.0, Digital Platform Economic Model and the Identification of Labor Relations—A Case Study of Crowdsourcing" (NSTC special research project).

Talent Demand for Emerging Occupation Categories under the Trend of Digital Transformation

Under the trend of digital transformation, enterprises tend to adopt the AIoT+HRC production model, which will not only help improve production efficiency, but also increase related needs for human resources. Because the AIoT+HRC production model requires the compilation and analysis of collected data, enterprises will need professional talents to perform such tasks. Therefore, demand for talents specializing in the production or services related to AIoT or HRC will be created.

According to the "Survey on Manpower Supply and Demand in Key Industries"⁶ published by the National Development Council (NDC), it is estimated that from 2023 to 2025, among Taiwan's 19 key industries, the top three industries with the highest ratio of new manpower demand to current employment in the industry (i.e., industries with the most urgent demand for new talents) are, in the order of ranking, 1) cold chain logistics for agricultural produce, 2) AI application service, and 3) smart machinery. The latter two industries are both directly related to AI or HRC, and have a strong demand for talents specializing in these two fields. In terms of statistics, demand for new talents in the smart machinery industry is about 20,000 people per year, accounting for 19.3% of the total employment in the industry; for the AI application service industry, demand for new talents is about 5,000 people per year, accounting for 15.0% of the total employment in the industry. In addition, industries directly related to AI also include the integrated circuit (IC) design industry, whose demand for new talents is about 3,000 people per year.

Although the demand for new talents in smart machinery and AI application service has grown significantly, most young people aged 15-29 in Taiwan work in the service sector, accounting for 70.26% of the total youth employment, among which the wholesale/retail industry accounts for the largest number of youth employment at 17.23%, followed by accommodation and catering at 12.6%, medical and social work service at 6.45%, education at 5.71%, finance, insurance, and real estate at 4.82%, and transportation, warehousing, and communications at 3.3%. In these service industries, the introduction of AI is not yet commonplace. As for the industrial sector, only 28.26% of all young people aged 15-29 work

6 National Development Council. (2022). "Survey and Estimation Report on Talent Supply and Demand in Key Industries," page 6.

in this sector. Among them, manufacturing accounts for the largest number at 20.77%, followed by construction engineering at 6.79%⁷.

As enterprises adopt the AIoT+HRC production model, they will need talents who can perform new tasks. As a consequence, new occupation categories will be created in the labor market. According to a questionnaire survey⁸ conducted by the Ministry of Labor among executives of large enterprises in Taiwan's electronics, machinery, and chemical industries, after Taiwan's large-scale manufacturing industries introduced the AIoT+HRC production model, seven emerging occupation categories have reported a demand for "smart manufacturing" talents which exceeds the threshold of 50%, including robot perception system engineers (50%), robot electro-mechanical integration engineers (66.67%), smart handheld device embedded system/application software engineers (54.17%), big data engineers (58.33%), IoT application engineers (62.50%), website/system designers/developers (50%), and system integration engineers (62.50%). It is thus obvious that there has been a significant growth in human resources demand for smart-manufacturing-related positions in Taiwan's large-scale manufacturing industries.

Job Opportunities Created by AI under the Trend of Digital Transformation

When industries increase their demand for AI talents, many AI-related job vacancies will be created as opportunities in the labor market. In this regard, it would be conducive to examine job vacancy data related to AI on job search platforms as a way to understand AI-related employment opportunities for Taiwanese youth, because such platforms are what most young people in Taiwan would first visit when they look for jobs. That is, private employment service agencies, mainly job search platforms, are the most frequently used job search channels for young people in Taiwan. A 2023 survey by the Directorate General of Budget, Accounting, and Statistics⁹ shows that in the process of job hunting,

7 Directorate General of Budget, Accounting, and Statistics. (2023). "Employment by Industry" (analysis table), *Yearbook of Manpower Survey Statistics* (e-book).

8 Chang Chih-chi. (2018). "Research on Labor Market Supply and Demand and Youth Employment Incentives under the AIoT Production Model" (a report commissioned by the Institute of Labor, Occupational Safety, and Health, Ministry of Labor), page 161.

9 Directorate General of Budget, Accounting, and Statistics. (2023). "How the Unemployed Find Jobs" (analysis table), *Report on the Manpower Utilization Survey* (e-book).

young people aged 15-29 in Taiwan will use an average of 2.04 job search channels. The usage rates of such channels are: private employment service agencies (72.5%), advertisements (50.3%), referrals from relatives, friends, and teachers (35.1%), and public employment service agencies (32.2%).

In the past decade (from 2014 to 2023), Taiwan's labor market has also witnessed a significant growth in the number of job vacancies related to AI, as the industry's demand for AI application talents has also grown to a considerable extent. According to statistics¹⁰ from the talent database of 104 Job Bank, the job search platform with the largest market share in Taiwan, it can be observed from the figure below that in 2014, there were only an average of 2,468 AI-related job vacancies per month. However, in July 2023 the number that month exceeded 26,000, presenting a rapid 10.53-fold growth as compared with the data from 2014.

AI-Related Job Vacancies

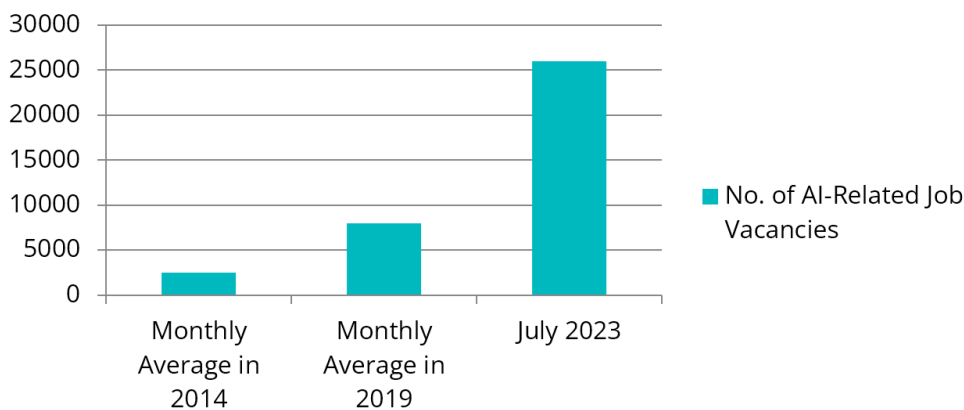


Figure 1. AI-Related Job Vacancies

Source: Chang Chung-hao. (2023). "Analysis of the Impact of AI Applications on Job Vacancies in Taiwan's Job Market," page 9.

An analysis of the job content of the top 30 vacancies directly related to AI shows that most of these positions require skills related to "general AI," such

10 Chang Chung-hao. (2023). "Analysis of the Impact of AI Applications on Job Vacancies in Taiwan's Job Market" (research commissioned by the Workforce Development Agency, Ministry of Labor), page 9.

as Python and C++ compilation, database management, software operation, big data analysis, and other R&D-related skills. In addition, some positions require transversal skills, such as communication skills, project management, etc. These are currently the skills required by all the five AI-related occupation categories. Among the five major categories of vacancies, there are also specific professional skills required by each, such as firewall design skills in information security, cloud design and big data analysis in cloud computing, algorithm development in AI development, and automation/system integration skills in IoT.

What is more, an analysis of such AI-related employment opportunities in terms of occupation category would reveal that there are mainly five occupation categories, i.e., AI development, big data analysis, cloud computing, IoT, and information security. By industry, nearly 60% of the job opportunities are concentrated in the electronic information, software design, and semiconductor manufacturing industries. Another 20% come from general manufacturing, and another 10% come from wholesale/retail, MLM (multi-level marketing) and direct sales, legal services, accounting services, consulting services, R&D and design, etc.

Risks of Technological Unemployment Caused by AI

As more and more enterprises apply AI technology to their production processes, many worry that such technology would have an adverse impact on laborers. Among the various issues, one that has received particular attention is whether laborers would face technological unemployment. Here, the term “technological unemployment” refers to the phenomenon that the demand for labor to achieve the same production capacity has decreased due to technological progress and thus results in the unemployment of laborers. Among the various laborer groups that may face technological unemployment, young workers are of particular concern because since 2002, the unemployment rate for youth aged 15-24 in Taiwan has risen to 11.91%, the first time that youth unemployment rate exceeds the threshold of 10%. Since then, the unemployment rate for youth aged 15-24 has remained above 10%. In 2023, the number is still as high as 12%, with the unemployment rate for youth aged 25-29 at 5.99%. The high youth unemployment rates over the last two decades have caused great concern about whether youth in Taiwan will further be challenged by the risk of technological unemployment caused by AI technology.

Regarding this topic, research literature on how AI may affect employment opportunities in Taiwan is still limited. So far, there are only a few qualitative research papers that focus on the impact of AI on laborers' work mode. For

example, the Ministry of Labor once conducted an interview-based study on Taiwan's financial industry¹¹. The interviewees include executives, corporate union representatives, and employees in the financial industry, as well as AI experts and other specialists. According to the study, the financial industry usually uses AI technology to assist in the handling of highly repetitive routine tasks. However, while AI replaces old job content, new tasks will also emerge. Following this trend, banks will require their employees to reduce work time for routine tasks and dedicate such time to other emerging business tasks.

That is, after Taiwan's financial industry introduced AI technology, changes in business models have been observed, which have led to changes in work modes and replaced part of the labor force thereafter. First of all, work modes of some business tasks changed after the financial industry introduced AI technology, but it does not mean that all job categories would be replaced because some services require a human touch to facilitate interaction and communication, and this is something that AI cannot perform yet. On the other hand, the impact of AI on labor force replacement in the financial industry mainly revolves around highly repetitive transactional tasks, and this has resulted in changes in some bank tellers' job content. With AI systems replacing the tellers' clerical work, banks typically reappoint these tellers to work as financial management specialists or insurance business specialists, and their new job content will usually involve the solicitation of investment or the purchase of insurance policies. The work of a financial management specialist requires high empathy so that they could understand the customer's thoughts and win the customer's trust, and AI systems do not have this quality yet.

In addition to the qualitative research mentioned above, there is also the Workforce Development Agency's 2023 study which used "AI Impact Score" to analyze and compare occupations with the highest and lowest impact from AI in Taiwan's labor market. According to the comparative analysis¹² in the study, the top 30 occupations with the highest risk scores for the impact of AI in Taiwan's labor market are mainly back-office jobs or professional service sector positions, such as office staff, marketing/PR personnel, technology sales professionals, ICT professionals, financial professionals, and process control technicians. Based on interviews with Taiwanese enterprises that have introduced AI technology, the study points out that one computer manufacturing company has introduced the "Robotic Process Automation" technology, which can allow robots to

11 See footnote 3, page 107.

12 See footnote 8, page 20.

automatically learn to perform some repetitive tasks. For example, routine tasks such as inspection on the production line, data entry, accounting, etc. can be directly completed by robots. A bank also said that AI technology could complete simple, repetitive routine tasks more efficiently, and has thus replaced part of the tellers and customer service staff. On the other hand, the 30 occupations with the lowest risk scores for the impact of AI are mainly jobs that rely heavily on physical labor, such as healthcare/nursing staff, passenger car and small truck drivers, bus and large truck drivers, mining and construction laborers, property and household managers, etc.

Risks of Technological Unemployment and Job Transfer Caused by HRC

The earliest study in Taiwan to investigate whether HRC models would replace human workers is a survey¹³ conducted by the Institute of Labor, Occupational Safety, and Health (under the Ministry of Labor) in 2018. The survey illustrates that after large-scale manufacturers in Taiwan started introducing the AIoT+HRC production model, entry-level positions with reduced manpower demand include: front-line production personnel (54.17%), packaging and production operators (50%), front-line machinery and equipment operators (41.67%), warehouse personnel (54.17%), and raw materials and inventory handling personnel (50%). The gradual reduction in manpower demand for all these entry-level positions is higher than 40%. In other words, survey results show that with Taiwanese manufacturers introducing the AIoT+HRC production model, collaborative robots have replaced many labor-intensive and low-skilled workers in entry-level positions.

In addition to the above-mentioned survey, in 2023, the Ministry of Labor also conducted a survey report on the “Unemployment Issues Caused by HRC Technologies”¹⁴ among corporate executives of 103 companies in the fields of metal product manufacturing and electronic component manufacturing to reflect the changes in entry-level manpower demand after these companies introduced HRC. Among the employees of these companies, young laborers under 30 account for 18.85%, and workers aged between 31-44 account for 41.42%, which add up to a total of 60.27% and constitute the majority of all employees.

13 See footnote 6, page 171.

14 Hsing, Ping-long. (2023). “Analysis on International Experience in Human-Robot Collaboration Trends and Labor Rights Protection” (a report commissioned by the Ministry of Labor), page 152.

Therefore, when enterprises introduce the HRC production model, it is mainly the young and prime-age workers who would face the risks of unemployment or job transfer. Here, the term “job transfer risk” refers to the risk that may occur when the employer reappoints an employee to a position unrelated to their original duties based on the enterprise’s needs, which may result in the risk that the employee may experience changes in working conditions and difficulty in adapting to the new job content. The results show that 6.8% of the enterprises surveyed have reduced demand for existing entry-level manpower, and 5.8% of them have reduced their investment in entry-level manpower in response to the introduction of HRC. In addition, in 23.3% of the enterprises surveyed, workers have reported difficulty in adapting to new job content. The response strategies of these companies are mainly offering education and training (83.3%) and transferring employees to other positions (20.8%).

Recommendations on Youth Employment Policy-Making under the Trend of Digital Transformation

Based on the discussion above, under the trend of digital transformation, many Taiwanese enterprises have chosen to introduce AI or HRC production models or service applications, which has created emerging employment opportunities related to AI. However, such technologies have also replaced a small number of workers or have made it difficult for some workers to adapt to the new work mode. Among them, young laborers face a higher risk of unemployment or job transfer.

Currently, the government’s employment policy to help young people cope with the trend of AI mainly focuses on training programs. A specific example is “The First Industrial Talents” training program, which targets unemployed youth aged 15-29. The policy’s goal is to equip young people with the skills needed in various key industries highlighted by the government. Young people who participate in the program will be eligible for a subsidy worth up to NT\$100,000 in training expenses. Participants only need to pay NT\$10,000 and can receive a “training stipend” of NT\$8,000/month for up to 12 months. Starting from 2021, “The First Industrial Talents” training program has been offering “Technology and AI Application Talent” training courses.

In the face of youth employment risks arising from the trend of digital transformation, I hereby propose the following recommendations regarding policy-making. First of all, since young people seeking jobs for the first time often face problems such as “unclear career goals” and “insufficient job search channels” during the job-seeking process, it is necessary to invest in the strengthening

of such channels and relevant resources to provide aid to job seekers. It is recommended that public employment service agencies under the government should cooperate with schools/universities to offer career consulting services for young people seeking jobs for the first time, and the services should highlight the development trends in the labor market, especially those in the AI industry. For those who are willing to work in the AI industry as their first job, consultants can recommend them to participate in special employment training programs on AI technology to improve their professional skills, and then offer match-making services for employment after the training program is completed.

Secondly, in order to “respond to the risk of technological unemployment,” it is recommended that the Ministry of Labor should formulate the *Guidelines for Dismissal Incidents in Response to Enterprises’ Introduction of AI Technology*, and require employers to inform young laborers in advance before enterprises introduce AI or HRC-related technologies. In case of dismissal incidents, regulations in the *Act for Worker Protection of Mass Redundancy* must be implemented and employers must assume the obligation to assist in the relocation or settlement of the affected workers to mitigate the impact of technological unemployment.

Thirdly, in order to “prevent job transfer risks,” young laborers should actively learn more skills related to AI or HRC to ensure that they will not be affected and even become unemployed as a result of reduction in manpower requirements after AI or HRC-related technologies are introduced. The government should also establish occupational benchmarks in line with the manpower needs of AI or HRC technologies, and organize vocational training courses/programs according to the skill levels of young laborers to prepare them for future career development.

Chien-Hung Lee is Professor of the Department of Labor and Human Resource at the Chinese Culture University since August 2006. He studied Sociology at the National Taiwan University from 1992 to 1998, where was awarded his doctorate degree in June 1998. He then served as an assistant professor of the Department of Industrial Relations at Da-Yen University from August 2000 to July 2006. His research focuses on Employment Policy, Digital Transformation and Labor Policies, Nonstandard Labor Policies, Labor Market Risks Analysis etc.

Conclusion and Policy Recommendations

Boon Yee Lim

Shared Challenges

The eight papers compiled in *Asia's Future Workforce: Shaping Responsive Education and Employment Policies for Youth and Beyond* highlight recurring challenges and opportunities in education and employment across ASEAN, Indonesia, Malaysia, India, Nepal, Japan, Korea, and Taiwan. These issues can be categorized into three broad areas: education, employment, and gender inequality.

A. Education

To prepare youth for the future, education systems must equip them with foundational education, market-relevant skills, and soft skills. Despite efforts, significant disparities persist across Asia.

1. Foundational Education

Many countries across Asia struggle with unequal access to basic education, exacerbated by urban-rural divides and limited resources. Illiteracy rates remain high in less-developed nations like Cambodia, Laos, and Myanmar, where average schooling years are fewer than six. In contrast, countries like Singapore, Malaysia, and Brunei, which provide longer compulsory education, achieve higher levels of youth innovation and development. These disparities highlight the critical need to improve foundational education, as underprepared youth face greater risks of exclusion in a labor market increasingly demanding advanced knowledge and skills.

Inadequate investment in education exacerbates these issues. For example, Indonesia, Malaysia, and Singapore allocate around 20% of government expenditure to education, surpassing the global average of 14%. However, Cambodia, Laos, and Myanmar allocate significantly less, with high student-to-teacher ratios and limited resources. Even in better-funded systems, such as Malaysia's, educators often lack training in teaching future-relevant skills.

India's achievement of near-universal enrollment by 2022 highlights another critical gap: high enrollment rates have not translated into improved learning outcomes. Many Indian youth remain unemployed despite employers citing a shortage of skilled labor.

2. Market-Relevant Skills

The alignment of education with labor market needs is a persistent issue. Countries such as Taiwan, ASEAN member states, India, and South Korea emphasize the importance of skills-building education, including STEM, digital literacy, and vocational training. However, the effectiveness of vocational education is hampered by low enrollment rates, stigmatization, and outdated frameworks.

In South Korea, for instance, vocational education struggles to compete with the prestige of university degrees, particularly from elite institutions. This mismatch leaves many graduates feeling overqualified or underqualified, as seen in India and South Korea, where youth unemployment remains high despite increased educational attainment.

3. Soft Skills

Higher-order thinking skills, encompassing critical thinking, problem-solving, and creativity, are critical for workforce resilience and adaptability in a rapidly evolving environment. While countries like Malaysia recognize this need—reflected in its Education Blueprint (2013-2025)—teacher training remains a barrier.

The historical context in Indonesia illustrates additional challenges. The legacy of colonial policies and an overemphasis on vocational education for marketable talent has sidelined holistic skill-building, such as critical thinking and active citizenship. These gaps leave youth ill-equipped to address pressing societal challenges like corruption and climate change.

B. Employment

The complexity of youth employment issues spans job displacement, entrepreneurship, informal work, and demographic transitions.

1. Job Displacement

Technological advancements and shifting economic structures are major contributors to job displacement. In India, for example, the rise of AI-

driven roles has coincided with declining demand for non-AI positions, particularly in high-skilled sectors. Taiwan faces similar challenges, where AIoT+HRC production models have reduced demand for entry-level roles, affecting youth disproportionately. The new models brought about by technological advancement have also raised the risk of unemployment of on-the-job workers as they are transferred to another role but have difficulty adapting to the new job content.

Japan's shrinking youth population presents a different concern: declining mass hiring of new graduates may lead to increased youth unemployment despite low overall rates. Conversely, Japanese firms have mitigated the rise and decline of different roles by internal reassignments rather than layoffs, but this model may not be sustainable.

2. Limited Entrepreneurship

Entrepreneurship remains underdeveloped in many Asian countries, limiting innovation and job creation. Countries like Nepal, ASEAN member states, Japan, and South Korea highlight insufficient emphasis on entrepreneurship in education and policy frameworks.

Nepal, in particular, despite enjoying a youth bulge—40% of its population is under 25—struggles to retain talent, with millions of young workers migrating abroad for better opportunities. Tapping into sectors like agriculture, fintech, and tourism through technology-driven entrepreneurship could help mitigate this trend, but supportive policies and frameworks are largely absent.

3. Informal Workers and NEETs

Youth in informal work or classified as NEETs (not in education, employment, or training) face precarious conditions. Informal workers often lack social protections and are stigmatized, leading to exploitation. In South Korea and Japan, NEETs experience long-term challenges in reentering the labor market, with prolonged inactivity reducing employability.

Yet, flexible work arrangements, common among informal workers, may become more prevalent as youth prioritize work-life balance and flexibility in career planning. Policymakers must reconcile this trend with the need for protections and standards in informal employment.

4. Demographic Transitions

Asia's diverse demographic landscape presents both opportunities and challenges. Youth bulges in countries like India and Nepal strain labor markets, while aging populations in Japan, Taiwan, and South Korea exacerbate labor shortages. ASEAN nations currently benefit from a demographic dividend but must prepare for eventual aging transitions. Regional cooperation on labor mobility is crucial to address the issue.

C. Gender Inequality

Gender disparities persist in both education and employment, limiting inclusive development.

1. Education Access

Female literacy rates lag behind male rates across many Asian countries, particularly in CLM nations, where the gender gap can exceed 10 percentage points. Conversely, Malaysian boys underperform compared to girls in mathematics and reading proficiency, signaling gender-specific challenges in higher-order skill development.

2. Workforce Participation

Women face systemic barriers to workforce participation. In India, persistent gaps in educational and employment opportunities require comprehensive strategies to promote inclusion. In Japan and South Korea, women often withdraw from the workforce due to caregiving responsibilities, resulting in lower wages and limited career progression.

For instance, Japan's gender wage gap, driven by shorter career tenures among women, remains one of the largest in the OECD. Similarly, South Korea's female employment rates are high among younger women but decline significantly after childbirth, pushing many into precarious, non-regular jobs.

3. STEM Representation

STEM skills are highly sought-after in a rapidly developing digital society. However, women's underrepresentation in STEM fields further restricts opportunities in high-growth sectors. Japan has the lowest proportion of women in STEM among OECD countries, with only 27% of female students

pursuing these disciplines. While some progress has been made, such as increasing IT faculty enrollments, cultural norms and structural barriers persist.

Policy Recommendations

From the previous section, it can be seen that countries across Asia face common challenges in equipping their workforce for the future of work, with young people and women being particularly vulnerable to gaps in education and employment opportunities. The papers in this publication have provided valuable insights into how individual countries and regions are addressing these issues, but they also highlight significant opportunities for deeper cross-border collaboration. Realizing this potential requires robust policy support to bridge gaps and foster regional cooperation. Below are targeted policy recommendations to guide such efforts effectively.

A. Education

1. Ensure equitable access to quality education

Youth in rural areas across ASEAN face significant barriers to accessing higher education due to inadequate resources, financial constraints, and socio-cultural factors. To address this, targeted interventions should focus on building more schools, training teachers, and offering financial support to families should be implemented. Complementing these efforts, awareness campaigns can promote the value of education within rural communities. Such initiatives should prioritize foundational skills development to prepare students for advanced learning, including field-specific knowledge and skills as well as soft skills such as critical thinking, leadership, and adaptability, which are essential for thriving in a rapidly changing job market.

2. Expand digital learning infrastructure and access

Developing regional e-learning platforms can revolutionize education by providing flexible, high-quality learning opportunities, especially for rural youth. These platforms should offer a range of courses, certifications, and TVET modules accessible across borders. However, to make digital learning effective, governments must invest in basic infrastructure, such as affordable internet and devices, particularly in underserved areas. Subsidies to schools or community centers to subscribe to broadband

services and procure devices could expand coverage more effectively. In addition, online platforms provide an accessible way for young people to voice their opinions and participate in decision-making processes related to education. Moreover, professional development courses for teachers should incorporate new digital teaching methodologies, fostering both technical and instructional excellence. While transformative, digitalization should complement—not replace—traditional educational systems.

3. Strengthen vocational skills training

TVET programs can adapt quickly to the demands of digitalization, offering youth practical skills aligned with labor market needs. Governments should mandate minimum vocational training in school curricula, popularizing basic digital literacy like IT, coding, and data analysis. For example, India's National Council for Vocational Education and Training has established quality standards for TVET programs to enhance their relevance. Additionally, TVET programs should be flexible and customizable, enabling students to gain industry-specific skills that meet immediate market demands and foster long-term employability.

4. Foster academia-industrial collaboration

Collaboration between academic institutions and private enterprises can enhance educational outcomes through increased funding, access to up-to-date technologies, and industry-relevant curricula. For example, initiatives like the Digital ASEAN Initiative provide models for partnerships that bring in tech leaders like Google and Microsoft to offer internship opportunities, digital regulatory training, and technology and computing courses at 20 ASEAN universities. Similarly, India's Sector Skill Councils, led by industry leaders across as many as 36 sectors, demonstrate how a dedicated platform that consolidates skill development needs, qualification standards, and certification of training programs in a country can effectively align education with market needs timely. These partnerships can equip students with the right tools and knowledge to succeed in a rapidly evolving job landscape even before they enter the labor market. While conducive, guidelines or policies will be needed to prevent intern exploitation or a predominant focus on market demand in curricula that overlook holistic education.

5. Prioritize soft skills education

Soft skills, including critical thinking, problem-solving, and leadership, are vital for workforce readiness. Education systems should integrate structured lesson plans for these skills across all levels of schooling, supported by teacher training in differentiated instruction, the effective use of EdTech tools, and a dual-teacher model to enable the passing of experience between teachers. Inclusive curricula that reflect diverse cultural perspectives and encourage student input can further enrich learning. In addition, entrepreneurship education should also be included to foster creativity and resilience, enabling youth to adapt to societal and technological changes.

6. Evaluate educational spending effectiveness

Governments should establish task forces comprising policymakers, educators, and industry representatives to assess whether curricula align with market demands and whether resources are being effectively utilized, especially in addressing the urban-rural gaps and the challenges faced by first-line implementers--the educators. This evaluation should address gaps in instructional quality and identify areas where educational investments can be optimized. A clear framework for assessing outcomes will ensure that public spending translates into measurable improvements in student learning and workforce readiness.

7. Empower women in STEM education

Addressing the gender gap in STEM fields requires comprehensive policies that include scholarships, workshops, and training programs specifically for women. Efforts should also focus on reducing stereotypes by normalizing female STEM role models in textbooks and promoting gender equity in the workplace. For example, universities in Japan have introduced female quotas in STEM faculties to increase women's participation. While these quotas have sparked debate, they represent a crucial step toward creating more inclusive opportunities in traditionally male-dominated fields.

B. Employment

1. Develop one-stop job-seeker platforms

One-stop portals, like India's Skill India Portal, streamline access to career resources, training programs, and job opportunities, benefiting both job seekers and employers. Such platforms should include career counseling services, particularly for first-time job seekers, to address challenges like unclear career goals or limited job search resources. In responding to the rise of new roles driven by technology such as AI, public agencies could also partner with universities to guide youth toward AI-related careers through targeted training and job-matching services by utilizing these one-stop platforms. These platforms would enhance transparency in hiring and help young professionals navigate emerging industries.

2. Support employers to create jobs

Government incentives can encourage job creation across sectors. For instance, India provides employers with reimbursements for contributions to employee benefits, fostering additional hiring. Such policies not only stimulate employment but also promote equitable workforce development by targeting entry-level jobs. Similar programs could be implemented regionally, focusing on industries poised for growth, such as technology and green energy, to create sustainable employment opportunities. Nevertheless, incentives should be balanced with regulatory policies to prevent exploitation or ineffective allocation of the resources.

3. Enhance protections for informal workers

As the gig economy grows, labor laws must evolve to protect non-traditional workers. Policies should establish standards for work conditions, benefits, and social security for informal workers. Most Asian countries, where gaps in worker protections remain, must prioritize updating labor laws. Transparency systems, such as Japan's "Youth Yell" certification for ethical employers, can further safeguard young workers by promoting responsible hiring practices and offering greater job security in the informal sector.

4. Foster entrepreneurship

Establishing national startup incubation centers, supported by regional exchange programs, can drive innovation and job creation. These centers could provide access to funding, mentorship, and cross-border internship opportunities. In particular, governments should make SMEs a key contributor in this case, ensuring they have access to financing and fair corporate practices, as these businesses are critical drivers of economic growth and employment. In addition, entrepreneurship should also be rethought in a broader sense. As seen in Japan, entrepreneurship encourages not only the creation of startups but also intrapreneurship within existing organizations, fostering a culture of innovation.

5. Establish frameworks for upskilling and reskilling

Rapid technological advancements require structured frameworks to help workers adapt to new roles. Governments should mandate employer-provided training programs focused on emerging skills in AI, robotics, and other transformative technologies and transversal skills, such as communication skills and project management, that will become more relevant in a workplace where human-robot collaboration is growingly prevalent. These reskilling and upskilling programs should span workers' career tenure, so they can handle demands for new skills or a change in role in the long run, ensuring their long-term employability in evolving industries. These initiatives will mitigate job displacement risks while fostering a resilient and adaptable workforce.

6. Promote workplace inclusivity

Gender stereotypes that limit career opportunities must be addressed through inclusive workplace policies. Governments and employers should normalize shared family responsibilities, such as parental leave for both mothers and fathers, to reduce biases against women. Programs that support women's career advancement and address wage disparities are essential. Inclusive policies benefit not only individuals but also organizations, fostering diverse and innovative work environments that enhance overall productivity.

C. Regional Cooperation

1. Establish standard education and skills frameworks

Asian countries should collaborate to create interoperable standards for education and vocational training, ensuring consistent quality and mutual recognition of skills across borders. Regional alignment can facilitate labor mobility and address shared challenges like skills mismatches. Joint initiatives, such as defining minimum school years and teacher training requirements, can lay the groundwork for more cohesive educational systems.

2. Promote regional mobility and exchanges

Youth development can be enhanced through cross-border exchange programs for students and teachers, fostering cultural understanding and collaborative problem-solving. Regional competitions, joint research projects, and academic partnerships can foster innovation and sharing of best practices in addressing pressing challenges like AI adaptation, while agreements on cross-border labor mobility can address the lack of labor and the lack of jobs in respective countries under stipulated workers' protection mechanisms. Such initiatives will not only enhance skills development but also build a shared sense of responsibility among Asia's youth.

3. Foster public awareness of the interconnectivity of workforce development across borders

The education and employment systems of one country are increasingly intertwined with those of others. Talent mobility driven by better opportunities elsewhere can lead to labor shortages and a human capital drain in some nations, while others benefit from an influx of skilled workers. However, public understanding of these interdependencies remains limited. This could result in underutilization of or resistance against international agreements, regional mobility programs, and collective workforce strategies that could take better account of the interests of all stakeholders. While think tanks, NGOs, and civil society have played a vital role in raising awareness, governments should take a more active role in emphasizing the need for collective workforce development in Asia.

4. Bridge public, private, and civil society stakeholders with youth inclusion

To develop inclusive policies for education and employment, it is crucial to establish a robust interface for dialogue among the public, private, and civil society sectors. These trilateral discussions can ensure that diverse perspectives and expertise on future workforce welfare and career development are integrated into policymaking. While the report focuses on Asia, expanding engagement to include like-minded countries, such as countries in Europe, the United States, and beyond can facilitate the exchange of best practices, resources, and innovative approaches on a broader scale. Equally important is the inclusion of youth voices in these dialogues, as their perspectives and experiences are essential for shaping solutions that address their unique challenges and aspirations.

The TAEF's *New Southbound Policy (NSP) Youth Corridor* initiative, which leverages the tools of public diplomacy among youth in Asia and like-minded countries to address common challenges, offers a compelling model for facilitating such collaboration. By connecting single-point, community-based efforts across borders, the *NSP Youth Corridor* creates a regional network for resource-sharing and cooperation among youth. Integrating such networks, with experienced youth representatives contributing practical insights into policymaking dialogues can significantly enhance policy effectiveness and foster rational cooperation.

Conclusion

The recurring challenges of uneven foundational education, skill mismatches, underdeveloped higher-order thinking abilities, precarious employment, and persistent gender inequalities highlight the pressing need for responsive education and employment policies across Asia. These issues are deeply interconnected, requiring holistic strategies that emphasize inclusivity, adaptability, and future readiness. Crucially, fostering regional cooperation is essential to address these shared challenges effectively. By enhancing cross-border collaboration, sharing best practices, and creating networks that unite diverse stakeholders—including youth voices—countries can collectively empower their future workforce to navigate an increasingly complex global landscape, which will in turn strengthen Asia's overall resilience and competitiveness.

Asia's Future Workforce: Shaping Responsive Education
and Employment Policies for Youth and Beyond

