



Building innovation capacity through investments in education and skills development

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UNITED NATIONS TECHNOLOGY BANK
FOR LEAST DEVELOPED COUNTRIES

Determinants of national innovation capacity

- The *capability of a country to generate and commercialize a flow of innovative ideas and technologies over the long term.*
- What are its key determinants? Not many studies focusing on LDCs
- The experience of developed countries shows that **education and skills development** are fundamental determinants of 'innovative capacity'

An **inclusive national education system**

Building the capacity for **technical and vocational training**

Advanced human capital development at the **tertiary level**

The case of South Korea

- Education as share of **government expenditure** from 13.9% of GNP in 1975 to 27.3% in 1985
- **Free compulsory elementary school** in 1949: 90% enrolment rate by 1959.
- **Sequential expansion of secondary education** with equalization policy
- **Vocational training** emphasized to support the export of light industrial products like textiles
- The number higher education institutions rose quickly from 19 in 1945 to 55 in 1950

"Only those countries that have invested heavily in the formation of skills seem to be capable of catching up, and those that have not made such investment are falling further behind" Kuen Lee

LDCs: Incipient National Innovation Systems

- Firms only carry out **dispersed innovation activities** - due to low absorptive capacity, low knowledge generation and collaboration and lack of enabling conditions in the ecosystem
 - Most LDCs are at the bottom of the ranks of the Global Innovation Index
 - Most LDCs are also **below the efficiency frontier** to transform innovation inputs in tangible output
 - LDCs have the lowest level of productive capacities (PCI 31 vs. 46.8 for dev. countries)

Return from R&D activities is low and, in some cases, even negative, because the **lack of complementary factors outweighs the catch-up effect**



Source: Global Innovation Index Database, WIPO, 2023.

Skills for innovation in LDCs: what and how

- LDCs **premature de-industrialization**: a larger share of labour is moving to low-value, low-productivity and low-technology activities in the services sector
- Does the services sector in LDCs have the longer-term potential to enable workers and firms to raise their productivity over time?
- There is an expectation that **digital transformation will boost productivity**
- **Developing skills will be critical** for both digitalization and the services sector to support the process of structural transformation

How?

Enhancing **public and private spending on education** at all levels to build a skilled workforce

Focus on STEM and vocational training + raise awareness on STI professions

Develop a **broader set of skills**: creativity, management, behavioral and social

More important role of human, design, and organizational factors for innovation in services

There is a need to prioritize educational spending to meet **present and future skills** needs in the LDC economies – 21st century skills

Technology Makers Lab

The Technology Makers Lab is designed as a space where students can **explore, learn and make.**

TML provides modern workshops and tech equipment for LDCs, to:



**RAISE
ASPIRATIONS**



**FOSTER
CREATIVITY**



**DEVELOP
TECHNOLOGICAL
AWARENESS**



**DEMOCRATIZE
INNOVATION
OPPORTUNITIES**



Technology Makers Lab

Students will gain skills on entrepreneurship, creative thinking, critical thinking, solving complex problems, effective communication, teamwork



Robotics and Coding



Design and Production



Materials Science and Nanotechnology



Advanced Robotics



Electronic Programming and IoT



Software Technologies



Cybersecurity

Based on **BILIM TURKIYE** and **DENEYAP**, a successful model implemented by the Turkish Ministry of Industry and Technology and TUBITAK

High value for money (less than USD 100/child)

Designed to address the educational journey from its early stage



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