Preparing High-Performance Workforce for Driving Investment to Transition to New Industries

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Target Group

Graduate (Bachelor/Master/Doctor)

Researcher

Workforce

Goal 5 Yrs

Semiconductor & Advanced Electronics	EV	AI
80,000	150,000	50,000

MHESI, private, universities, and domestic and international research institutes collaboration.

Short-Term

1. Upskill/Reskill
2. Industrial Internship
3. International Internship

Mid-Term & Long-Term

4. Bachelor of Semi. Eng.
5. Joint Degree
6. Ph.D. Scholarship

Overview of the Semiconductor workforce development plan

Targeted Group

Workforce Personnel

Student

Lecturer/ Researcher

Phase 1 of the National Semiconductor and Advanced Electronics Workforce Development Plan (2026-2030):

Programs for Specialized High-Performance Workforce	Programs for Research and Development Personnel:
Upskill/Reskill: 69,000 people	Master's-Doctoral Joint Degree/Sandbox Programs: 1,400 people
Industrial Internship (Coop+): 7,500 people	Targeted Ph.D. Scholarships: 280 people
International Internship: 1,300 people	Train the Trainer: 100 people
Bachelor's Sandbox Curriculum: 7,100 people	

Output

No. of High-Performance Workforce:

84,900

No. of Researcher

1,780

3 National Training Centers will be Established at:

- King Mongkut's Institute of Technology Ladkrabang
- King Mongkut's University of Technology North Bangkok
- Mahanakorn University of Technology

Demand consortium

University consortium

Short-Term Demands : Industrial Internship (Coop+)

3rd or 4th Year Students

Pre-sessional Course

Common Module (Online platform) DEGREE PLUS	Bootcamp	
Module 1 : Inside Tomorrow's Tech: Semiconductors, Smart Electronics & CEO Insights	MATLAB simulation	Basic of analog & digital
Module 2 : Digital and Analog Electronics / Circuit Design and Analysis	Basic of Instrument	Basic of Semiconductor
Module 3 : Test Hardware Knowledge / Testing and Verification	**Soft skills** : Project management & Problem solving	

Industry Internship ≥ 6 months

Bachelor's Degree + Industry Experience

Mid-Term and Long-Term Demands : Bachelor of Semiconductor Engineering (Sandbox)

High School

2nd Year

Year 1 & 2

Fundamentals in Science and Engineering

Year 3 & 4

Semiconductor Modules

Industry / International Internship

Bachelor's Degree in Semiconductor Engineering

Year 5

Track I: Domestic Academia-Industry

Track II: International Collaboration

Advanced Semiconductor Engineering

Master Degree in Engineering

+ Industry or International Internship Experience

Training Center : Strategic Mechanisms for Semiconductor Workforce Development

Semiconductor Industry | **PCB Industry**

IC Design → Wafer Fab → Assembly, Testing, Packaging → PCB → PCBA

Examples of Industry Collaboration Across the Three Training Centers

THPCA (Thailand Printed Circuit Association), UTAC, EIC, PTT Group, Analog Devices, Infineon, Delta, Microchip, SPEA, STARS Microelectronics, NXP, Silicon Craft

University Consortium

National Training Center

Missions

KMITL

Centre of Sandbox Curriculum for specialized demand-driven education in Semiconductor Engineering, collaboratively with a University Consortium comprising >10 institutions

KMUTNB

A hub for the domestic semiconductor industry that fosters educational collaboration through shared resources, industry expert engagement, and cutting-edge equipment donations from corporate partners

MUT

- Global semiconductor alliances optimize expertise and resources.
- Shared specialists accelerate innovation capabilities.
- Jointly developing curricula and research initiatives training center

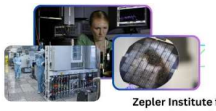
Examples of Collaboration with Leading International Higher Education Institutions by MUT

Imperial College London

Centre for Bio-Inspired Technology

ASU Arizona State University

National Semiconductor Technology Center (NSTC) & Advanced Packaging Piloting Facility



Zepler Institute for Photonics and Nanoelectronics

University of Southampton

UNSW Sydney

Output :

- Curricula Co-creation/ Demand-driven
- Short Courses (Skill Certificate)
- Train the trainers
- Co-research
- Prototype
- Deep Tech Startup/ Spin-off

STEM One-Stop Service Platform

STEM One-Stop Service (STEM OSS)

- Industrial Co-research
- Work-Integrated Learning
- Upskill/reskill
- Sandbox

Demand Side Touch Point

TALENT THAILAND

Finding experts in 10 industries
5 Frontiers

Thailand Plus Package

- New STEM employment: 150% tax deduction
- Training program certification - Employee training: 250% tax deduction

depa

THAILAND BOARD OF INVESTMENT

- Merit - based Incentives (vocational, bachelor's, master's)
- Competitiveness Fund

Supply Side

Policies and mechanisms for workforce development

Ministry of Higher Education, Science, Research and Innovation's Policies and Mechanisms:

Smart Farmers

Digital Marketing

Tourism

Electric vehicle

Data Scientist

Skills Development for Future Workforce (Reskill/Upskill):

Development of short-term programs within educational institutions to **enhance workforce and graduate skills** to meet labor market demands and support lifelong learning

Key Features

- Certificate programs (Non-degree) through Co-creation mechanisms between industry, service sectors, and higher education institutions
- Teaching and learning methods emphasizing collaboration with industrial and service sectors

Implementation

- Survey skill requirements of the industrial sector
- Develop programs in the form of Modular education and/or Modular curriculum
- Examples: Smart farming, Care giver, Smart innovative entrepreneur, Food for the future, Creative content, Data science, Robotics

New Generation Graduate Program

Creating new-generation graduates and high-performance workforce for working in new industries, and establishing a platform for future higher education development.

Key Features

- Collaboration based on industry and community needs, in both Degree and Non-degree formats
- Transforming the university ecosystem by creating comprehensive and intensive partnerships with enterprises
- Building experience through real-world practice in workplaces
- Enterprises apply knowledge to solve problems or improve operations

Implementation

- Non-degree: 329 programs with 22,033 learners
- Degree: 91 programs with 9,115 learners
- Faculty training (Coaching): 227 instructors
- Examples: Precision agricultural technology, Big data analytics, Digital service innovation

Skills Development for Employment According to National Needs (GenNX)

Intensive skills development directly aligned with employment demands

- Matching job seekers with private sector or employers
- Private sector or employers participate in curriculum design
- Intensive short-term training (Bootcamp) 4-12 weeks

Example Careers

- Junior software developer
- Elder caregiver

Implementation

- 361 training graduates (86% employed within 3 months)
- Income increased 2-6 times

High-Performance Workforce Development Platform Supporting Investment in Production and Service Sectors

Coordination Center for High-Performance Workforce Development Platform (STEM One-Stop Service: STEM OSS)

STEM OSS **Implementation**

1) Demand analysis
   - Market segment & analysis
2) Job Matching / Universities Connecting
3) Training & Co-creation & accreditation
   - Industrial co-research
   - Work-integrated learning
   - Upskill/reskill : GENX model
   - H.E. Sandbox
4) Talent management & utilization
   - Talent pool Finding experts in 10 industries 5 Frontiers
   - Dashboard
5) Incentives
   - Tax incentive
   - Financial incentive

Policies and mechanisms for producing and developing workforce to supply to industries by the Ministry of Higher Education, Science, Research and Innovation

Cooperative and Work Integrated Education (CWIE)

The production and development of technical and technological workforce with competencies that directly match labor market demands and are ready for the real working world

Key Features

- Degree education management where learners study at higher education institutions alongside practical work experience in enterprises
- Curriculum that enhances in-depth knowledge and technical principles, and increases working skills in industry
- During study, learners receive compensation or benefits from the industrial sector

Implementation

- 97 domestic higher education institutions
- 21 international higher education institutions
- 3,051 domestic programs
- 79 international programs
- 92,295 domestic students
- 1,254 international students
- 13,858 participating enterprises
- 348 foreign enterprises

Integration of Learning with Working (Work-integrated Learning: WiL)

The production and development of technical and technological workforce (from High Vocational Certificate to Master's Degree) with skills and knowledge that directly match the needs of the industrial sector

Key Features

- Educational management using a "School in Factory" approach, connecting education with real work
- Curriculum that enhances in-depth knowledge to develop professional expertise and industrial working skills for understanding industrial systems

Implementation

- 6,423 graduated students (2012-2023)
- 16 universities
- 100 vocational education institutions
- 25 enterprises across various sectors including food, automotive parts and industrial machinery, chemicals, electronics and IT, and other businesses

Elevating the Industrial Sector through Graduate Education Production and Research, Development and Innovation (Hi-FI and RDI)

The development of high-quality graduate-level workforce that can research and develop products and innovations in alignment with industry needs within a 2-year timeframe, using a tailor-made approach

Key Features

- Creating a Consortium-style network to address diverse challenges through multidisciplinary professionals
- Using business problems as shared goals between industry and educational institutions
- Industry sector collaborating in curriculum design and educational management that emphasizes learning alongside research in the workplace

Implementation

- Hi-FI network of 9 universities
- From 2019-2021, there were 23 programs, 70 students, and 35 participating companies
- Examples of Hi-FI projects: Utilizing quantum computing to solve industrial problems, DNA technology for sustainable stingray breeding
- 83 RDI students graduated (2017-2021) from 10 establishments, 42 students currently studying (2022-present) from 4 establishments

Higher Education Sandbox

Innovation in new educational management to produce human resources with competencies that directly match the country's needs and keep pace with change

Key Features

- Educational management that transcends limitations of standard criteria
- Creation of higher education innovations such as breaking down curriculum structures, formation of Consortiums between educational and business sectors, and flexible educational management models
- Curricula developed based on labor market needs or graduate employers' requirements

Implementation

- Sandbox Semiconductor Engineering Program (Bachelor's degree)
- 16 other curricula approved by the Special Committee
- Network of 28 higher education institutions and partner organizations
- 530 students enrolled in Sandbox programs.
- Examples of high-skilled workforce fields: Digital, AI, Semiconductor, Cybersecurity, High-tech Entrepreneur, Frontier Science