Industrialization 4.0: Challenges to Higher Education Institutions

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1. Thailand’s Industrialization 4.0 (Thailand 4.0)
Light Industry and low wages

Smart Industry, Smart City, Smart People through Creativity

Agricultural-based society

Heavy Industries and Advanced Machine
Objectives of Thailand 4.0

Ministry of Foreign Affairs, Thailand

* Inclusive Society
  * Disparity Reduction from 0.465 to 0.36 by 2032
  * Complete social welfare system in 20 years
  * 20,000 smart farmers households

* Economic Prosperity
  * R&D 4% of GDP
  * 5-6% economic growth
  * 15,000 USD income/capita by 2032
  * 20,000 smart farmers households

* Social Well-being
  * Inclusive Society
  * 10 cities as the world’s most livable cities
  * 5 HEIS are ranked as the world’s top 100 in 20 years

* Raising Human Values
  * Competent human beings of the 21st century
  * Increase of HDI from 0.722 to 0.8 (top 50) in 10 years

* Environmental Protection
  * Low-carbon society
  * 10 cities as the world’s most livable cities
Why Thailand 4.0?

01 Economic and Social Adaptation
Globalizing knowledge-based economy

02 Policy Diversion
Focusing more on value-added segmentation

03 Knowledge-Intensive
Knowledge-intensive products and services

Source: Division of Economic Information, Department of International Economic Affairs, MOFA
Agenda
Preparing 'Thais 4.0' through the reform of education system and training programmes

Agenda
Developing Technology Cluster and Future Industries

Agenda
Incubating Entrepreneurs and Developing Innovation-driven enterprises

Agenda
Establishment of Regional innovation hub or the “Province 4.0”

Agenda
Integrating with ASEAN and connecting Thailand to the Global Community
Improve Thais 1.0 and 2.0

Skill Development
Supplying new skills through integrated education, training and career development for 4.0 industries

Education Reform
Transforming learning ecosystem to purposeful, mindful, active and outcome-based learning

Agenda 1: Preparation of Thais 4.0

01

02

03

Unlocking individual limitation and freeing them from poverty and the lack of economic opportunities
Agenda 2: From the Old S-Curve to the New S-Curve as New Engine of Growth
Smart Farming
From Traditional Farming

Start-ups
From Traditional SMEs

High valued services
From Traditional Services

Knowledge workers/
High skilled labors
From Unskilled Labors

Developing Technologies
From Buying Technologies

Transformative Shift
And Clusters for Innovation and Startups
Agenda 3: Priorities for Innovation

- Smart City
- Low-Carbon Society

- Water Management & Technology
- Food Innopolis
- Medical Hub
Focusing on the set up of trade database and favourable regulations for modern trade rules under Thailand 4.0

18 provincial clusters
Setting up clusters in the provinces, e.g. food innopolis, green tourism, logistic hub etc.

Regional Innovation Hub
Setting up hubs in the region for agriculture and food, aging society, smart city, smart energy and creative economy

Province 4.0
Promotion of local start-ups and the upgrading of enterprise 1.0/2.0 to 3.0 and 3.0 to 4.0

Agenda 4: Regional Hub and Province 4.0
New positioning of Thailand as a trading and business hub in the region through increasing the number of MNCs, EEC, targeted super industrial clusters and 10 super border economic zones

Bridging with CLMV economic contexts through trade and investment

Adopting GATS service mode of supply to create ‘service ecosystem’ for Thai industries and businesses in the global context

**Agenda 5:** Integrating with ASEAN and connecting Thailand to the Global Community
1. Active Role of Private Sector

2. Demand-driven Policy

3. Tailored support Fund

4. Global, Regional and National R&D Network

5. Vocational Training & Education System Upgrade

6. Infrastructure Development

7. Capacity building-based Investment promotion & Performance-based grants And Incentives

Source: Dr. Suvit Maesincee
Minister of Science and Technology
Thailand
Innovative Economy: Prosperity

- Enhancement of science, digital, information and media literacy
- Heavy investment in R&D
- R&I Cluster Development
- Incubation of technology & entrepreneurship
- Innovation-driven enterprise development
- Future skill development
- Management Of Digital Platforms

Regenerative Economy: Sustainability

- Disaster and Risk Management
- Smart and Livable Cities
- Non-carbon based Society
- Environmental-friendly and Clean Technology Business & Production
- Paradigm shift from ‘cost-advantage’ to lost-advantage

Distributive Economy: Stability

- Immunization of the bottom 40% of income distribution
- Negative income tax for low income segmentation
- Modernization of agriculture
- Education quality improvement
- Re-skilling, up-skilling, multiple-skilling
- Startups & social enterprises
- Regional & provincial development strategies (local economic development)
- Formation and distribution of innovation hubs
- PPP in public policy

Caring and Sharing Society: Social Inclusion

- Socially responsible citizens
- Eco-centric citizens
- Inclusive Growth for People
- Skill-based society

Source: Adapted from Dr. Suvit Maesincee
Minister of Science and Technology
Thailand
2. Higher Education and Thailand 4.0
Paradigm Shift in Education

- Economic to Learning Discourse
- Division of Labor to Knowledge Acquisition
- Plantation to Nomadic Mode
- Deficit to Dream Mode

Source: Prof. Kai-Ming Chen, Hong Kong University
* Demand for access and accountability
* Fiscal Austerity
* Un-predicted but connected world
* Diminished Resources
* Demographic Change

**VUCADEMIA**

**Thailand 4.0**

**Challenges on Thai HEIs**
* (C.1) Increasing Competition
* (C.2) Increasing Globalization
* (C.3) Advanced Technology
* (C.4) Increasing consumer/employment expectation
* (C.5) Changing workforce demography
Changing Administrative Paradigm

01

Investment in HR

02

University 4.0: universities will be transformed to embrace know-how and ideas of University 4.0 by adapting their administrative paradigm and the investment in human resources and giving more priority to serve the objectives of society. Universities will serve as bases for developing technology and innovation reform and building cooperation with leading international universities in each specific field research.

International collaboration

03

Universities are bases for technology development

04

2. Higher Education and Thailand 4.0
Expansion of Traditional HEIs (C.1, T.2)

Corporate Universities (C.4, C.5, T.1)

Long-distance Education (C.1, C.2, C.3, C.5, T.2)

Focus on lifelong and adult education (C.5, T.2)

1. Traditional HE Missions:
   * Research
   * Teaching
   * Social Engagement
   * Cultural Preservation

2. cross-border Education (C.1-C.5 T.4)

3. Professional certification, validation & franchising (C.1, C.2, C.4, C.5, T.2)

4. University-Industrial Partnership (C.3, C.4 T.3)
Learning is lifelong

Learning is everywhere

HEI as a learning organization

Learning and Working is the same process

New learning Digital platform

New Way of Learning: For HEIs
Global Competencies: 21st CS
* Critical thinking and problem solving
* Creativity and innovation
* Collaboration, teamwork and leadership
* Communications, information & media literacy

National Competencies
* Inquisitive
* Innovative
* Adaptative
* Critical & analytical
* Technological, media & communication literate

Institutional Competencies
* Cross-cultural understanding
* Career and learning skills
* Compassion

New Way of Learning: Learning Outcomes
3. Institutional Adjustment for Thailand 4.0: Mahidol University
MU’s 6 Strategic Practices

C.1, T.1 Increasing competition
* Setting up open/flexible education platform (flexi-edu) (S1)
* Professional certification/validation (S2)
* Cross-border education (S3)

C.2, T.4 Increasing Globalisation
* Setting up open/flexible education platform (S1)
* Professional certification/validation (S2)
* Cross-border education (S3)

C.3; T.3 Advancing Technology
* Entrepreneurial University (S4)
* Promotion of university-industrial partnership (S5)
* Cross-border education (S3)

C.4, T.4 Increasing Consumer/Employer’s expectation
* Entrepreneurial University (S4)
* Promotion of university-industrial partnership (S5)
* Cross-border education (S3)

C.5, T.2 Changing Workforce Demography
* Setting up of open/flexible education platform (S1)
* Education and research for Aging Society (Aging Society Hub) (S6)
C.1 Increasing Competition + C.2 Increasing Globalisation

S1.

Open/flexible education platform

- Online learning
- 110 MOOC courses and programmes from 2016-2018 for registered students (MU-EdX)

Credit collection and transfer for non-registered individuals (now)

E-learning for international market, e.g. MU in Coursera (future)
C.1 Increasing Competition + C.2 Increasing Globalisation

Cross-border Education

• Mahidol International College (est. 1986)
• 5 undergrad programmes (SC, EG, BA, LA, CA)
• 2 postgrad programme (hospitality management and MBA/Business Modeling)
• 3,800 students

No. of programmes in MU (other than MUIC): 333
• 250 out of 333 are international programmes (150 in postgraduate level)
• Degree collaboration: approx. 20 degree programmes

Current MoUs (for education and research): 562 (active around 50%)
• By region: Asia (301), Europe (128), North America (78), Australia and Oceania (28), Africa (2), Others (25)
3. CHALLENGES AND POLICY PRACTICES IN MAHIDOL

C.3 Advancing Technology + C.4 Increasing Consumer/Employer’s Expectation

Entrepreneurial University
Institute for Technology and Innovation Management – INNOTECH (Office of the President)

S4.

Administration
- Trainings for Administrators (MIT, NUS, HKU)
- University administrators
- Deans
- Course Developers

Education
- Entrepreneurial attitudes through ‘General Education’ (30 credits) for 4,200 students (1st – 4th year)
- Courses in various faculties aimed at creating:
  - start-ups companies
  - Social enterprises
  - Environmental innovation etc.

Student
- Students’ skill Enhancement and Infrastructure
  - Entrepreneurial skills
    (bootcamp, design thinking, co-learning space)
  - MU Centre for Entrepreneurship Development
  - Digital literacy
  - Soft skills

Research
- Incubator
- Accelerator
- Research gap fund
- Pre-seed Money
3. Challenges and Policy Practices in Mahidol

C.3 Advancing Technology + C.4 Increasing Consumer/Employer’s Expectation

Promotion of university-industrial partnership

- Multidisciplinary research clusters + pool expertise
- Demand-driven research from end-users
- Key research clusters:
  - bio-innovation,
  - food technology,
  - bio-medical engineering, intellectual property management and innovation,
  - Medicine+ medical technology etc.

Industrial partnership

- Biopharmaceutical manufacturing (Siam Bioscience Co.Ltd.)
- Bio-resource Co.Ltd. (with Nomura Jimusho)
- Medical devices development (Tottori Prefecture, Japan)
- Global Innovation Incubator (Thai Union Frozen)
3. CHALLENGES AND POLICY PRACTICES IN MAHIDOL

C.5 Changing Workforce Demography

S6.

- A part of the innovation hubs in smart technology, food and agricultural hub, creative economy, bio-energy and aging society. (Thailand 4.0 – Council of University President of Thailand)

- MU is assigned to oversee the ‘Aging Society Hub’ and to collaborate with other Thai HEIs (CMU, NU, KKU, CU, BUU, PSU - Spokes) ➔ Translational research and start-up projects in:
  - Applications for healthcare services
  - Local product development and food innovation for the elderly
  - Basic Self-care trainings
  - Medical innovation, healthcare products, innovative aging products/services
  - Health technology and innovation incubator