


ROLE OF TVET IN IR4.0 - MALAYSIA

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ICS

WHAT IS IR4.0?

INDUSTRIAL REVOLUTION



The industrial revolution begins. Mechanization of manufacturing with the introduction of steam and water power

1st
Revolution




Mass production assembly lines using electrical power

2nd
Revolution



Automated production using electronics, programmable logic controllers (PLC), IT systems and robotics

3rd
Revolution



Autonomous decision making of cyber physical systems using machine learning through cloud technology

4th
Revolution

TWO QUESTIONS

Q1

WHAT IS COUNTRY'S ATTAIMENT OF IR4.0?

- What caused the shortfall?
- How can the shortfall be bridged

Q2

HOW CAN EDUCATION BRIDGE ANY SHORTFALL IN IR4.0?

- How can education help?
- What obstacles lie in the way?
- Are subsectors particularly suited for IR4.0?
- Should education lead or lag the economy?

MALAYSIA AS A CASE STUDY

- Malaysia achieved rapid growth for 2 decades;
- 1990 Mahathir announced Wawasan 2020.
- But derailed by Asian Financial Crisis
- Growth never recovered
- Najib pushed target to 2030.
- But structural deficiencies may still render this unachievable



Mastering IR4.0 vital

MALAYSIA'S PREPAREDNESS FOR IR4.0

Feb 21 Malaysian digital Economy Blueprint (MDEB)

- “... to transform Malaysia into a digitally-driven, high-income nation and a regional leader in digital economy...”

July 21 National Fourth Industrial Revolution (4IR) Policy

- “,, broad... policy that drives the adoption of emerging technologies and ... drive digitization across the nation,,,”

SEP 21 Twelfth Malaysia Plan (12MP)

- “,, accelerating technology adoption and innovation as a ‘-0;icy enabler’,,”

PROJECTION vs. REALITY

CEO HRDF (2017)

- Malaysia not yet in IR4.0.
- Only 30% of workforce equipped.

KAUR (2019)

Malaysia falling behind in IR4.0 adoption.

Techwire Asia (2019)

- No structure for collaboration between private and public sectors..
- Uncertainty over funding

TM One (2019)

Many manufacturers still rely on low cost labour and hesitant to invest in innovative automation techniques

SURVEYS OF STUDENTS

IDRIS (2019)

- Surveyed 400 public university students.
- Found 70% have some understanding of IR4.0.
- University effort to promote IR4.0 insufficient

CHALIL (2019)

- Surveyed 550 private university students.
- Found students and parents unprepared to join IR4.0 workforce.
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MALAYSIA'S ADVANTAGES & CHALLENGES

ADVANTAGES

- Strategic location as e-commerce hub
- Good infrastructure
- Low office rents
- Industrial zones with investment incentives

CHALLENGES

- Companies reluctant to embrace changes
- Shortage of talent
- Stringent regulations
- TVET's limited success

IS MALAYSIA IR4.0-READY?

SITUATION ON THE GROUND

ADVANTAGES & CHALLENGERS

DE-INDUSTRIALIZATION

INSTUTIONAL DECAY

MALAYSIA IS NOT IR4.0-READY!

A MAJOR ROLE FOR EDUCATION

GENERATION Z STUDENT PROFILE

- Want to control learning.
- Enjoy group discussion and collaboration in interactive environment
- Learning not geographically limiter
- Mastery of technology
- APPROPRIATE PEDAGOGY

CHALLENGES FOR EDUCATION

EMPLOYMENT NATURE CHANGING

- Demand for new graduates fall; for specialists maintained
- As demand change, so will employment
- Technologies at work & learning changing
- Students' study habits also changing.

LEARNING & LEARNING SUCCESS

APPROPRIATE PEDAGOGY

- Nurture creative thinking, entrepreneurial, have cognitive flexibility for complex problems.
- Collaborative skills
- Data & digital literacy
- Individualised learning modes
- Cross-disciplinary MOOCs
- Practice-oriented learning
- Life-long learning through shortened courses

INGREDIENTS FOR SUCCESS

- Universal access to the Internet..
- Commitment of teachers - need competencies,, learning methods, ict, infrastructure,
- Resistance inevitable
- For teachers, greatest mindset change is to recognize the student is the centre of attention,
- TVET to the fore

WHY TVET?

TVET

- More work-oriented
- Internships vital, learning-by-doing.
- Experience-focused.
- Flexible learning

ACADEMIC STUDY

- More academic oriented.
- Internships for some subjects.
- Study-focused.
- Structured learning

MALAYSIA'S TVET EVOLUTION

- 1964:ministries established skills training
- 2013 World Bank critique; ; Ismail & Hassan critique
- 2010-2020 11MP
- 2020 Pandemic
- 2020 Launch of 12MP.

MALAYSIA'S TVET - CRITIQUES

WORLD BANK SABER	ISMAIL-HASSAN
Policy vs. implementation	Technical teaching staff shortage
Allocations vs. performance	Supply-driven – weak monitoring & evaluation
Limited role for non-state actors	High opportunity cost of flexible learning
Workers no voice	Need legislation, institution framework
Many institutions, coordination issues	TVET concentrated at low-level skills
Public's negative perception	Mostly for Malays

THE STATE OF TVET 2013 - 2020

- Until 11MP, and 12MP, TVET had not received as much attention as academic education.
- Only 7% of secondary school leavers enroll in TVET programmes.
- Only 70% of placed student offers have been filled.
- Dropouts from primary and secondary fallen but still significant.
- % of skilled workers fallen over 15 years but % unskilled workers risen.
- Youth unemployment higher than national average.
- Reliance on academic qualifications in hiring TVET instructors,

11 MP – TARGETS & ACHIEVEMENT

TARGETS

- Labour productivity to grow 3.7%.
- Salary to reach 40% of GDP.
- Median wage to reach RM2,500.
- For TVET – 60% of 1.5 mil. Jobs by TVET graduates
- 225,000 2ndary school leavers in TVET.
- Lifelong learning through HRDF.
- >1,000 TVET institutions.

ACHIEVEMENT

- Wage share lowest in SE Asia/ASEAN
- TVET students < ½ enrolled in academic programmes
- Public TVET offered no specialisations.
- TVET-trained technologist not recognized as professional.
- >1,000 institutions resulted in uncoordinated governance, unclear articulation, fragmented delivery

THE PANDEMIC

IMPACT ON EDUCATION

- Courses migrated online.
- Use of MOOCs
- New regime of learning & working from home.

LIMITATIONS of DIGITIZATION

- Lab work, some collaborative research cannot be done online.
- Nor can internships.
- Variable teaching quality.
- Cannot monitor students' understanding.
- Digital divide.

THE 12 MP

- Recognizes limitations affecting TVET, Remedy by:
 - Strengthening governance – single accreditation system
 - Improve programme quality – industry-led in partnership with TVET & govt.
 - Specialization introduced, clear career choices
 - From 163,000 to 225,000 students by 2029
 - Rebrand subsector
- Chances of success given 11MP? Challenges:
 - Many agencies involved
 - Coordination a challenge
 - Teacher education dominated by academic qualifications.
 - Require employer recognition.

IMPLICATIONS FOR MALAYSIA

- Malaysia is not at IR4.0 level by industry. Firms use the low-wage/low-cost model.
- It has also not achieved Education 4.0 to match IR4.0. It paid too little attention to TVET.
- But should education go all the way to instruct IR4.0 methods?
- Yes, for the following reasons:
 - Education 4.0 a new paradigm that remedies current education challenges.
 - Greater familiarity among workers may persuade industry to change attitude.
 - Catch-up with countries already using IR4.0.



THANK YOU