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MARINE INDUSTRY ISSUES AND CHALLENGES - EDUCATION AND R&D PERSPECTIVES

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INSPIRING CREATIVE AND INNOVATIVE MINDS



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Introduction

The Maritime Industry segments:

- Shipbuilding & Ship repair
- Ocean & Coastal Shipping
- Port Services
- Marine Professional Services
- Maritime Defence and Law Enforcement
- Government Authorities & Marine / Maritime Associations
- Marine and Inland Fishing
- Marine Tourism
- Marine Construction (Inshore & Off-shore)
- Marine Mining
- Marine Environment
- Marine Products & Services.



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Introduction

One of the biggest challenge: the development of local capability

- manpower,
 - expertise
 - R&D resources.
- Fast expanding maritime industry require human resources:
 - Shop floor workers, seamen, engineers, managers, researchers and ship designers.



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Introduction

3rd Industrial Master Plan 2006-2020 (IMP3)

- Defines strategies for development of various industries.
- Shipbuilding and Repair activities are categorised as marine transport equipment sector, although they also cover supply of fixed and floating structures to the offshore industry.

Ministry of International Trade and Industry (MITI). 3rd Industrial Master Plan 2006-2020 (IMP3), 2005, Kuala Lumpur.



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Introduction

IMP3 identified six challenges:

- global competition
- rising costs of raw materials
- excess capacity
- shortage of qualified personnel
- inadequate technology
- lack of infrastructure and support facilities.

Of these, the shortage of qualified personnel and inadequate technology are related to the functions of the Institutions of Higher Learning (IHL).



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Introduction

IMP3 then proposed five strategic thrusts for the long term viability of the marine transport sub-sector.

- **Enhancing domestic capabilities in the building of smaller vessels**
- **Intensifying the upgrading of skills and engineering capabilities**
- Strengthening the Infrastructure and support facilities
- Strengthening the institutional support
- Expanding activities in the fabrication of offshore structures.



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Introduction

Measures proposed to strengthen the upgrading of skills and engineering capabilities include:

- Providing more technical programmes to upgrade the technical skills of local shipyards.
- Encouraging the upgrading of skills in ship designing and engineering, metallurgy and corrosion control,
- Promoting the attachment of experts in training institutes
- Collaborating with major shipbuilding countries in the upgrading of skills in marine transport.



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Maritime Education in Malaysia

- Big emphasis on design capability, ‘**design**’, ‘**engineering**’ and ‘**(naval) architecture**’ in IMP3.
- For example, it notes that as far as expanding the fabrication of offshore structures is concerned, there is “a *need to promote development of **skills in the design and fabrication** of offshore production platforms for use in coastal and international waters*”.
- There is also a large demand for expertise in other fields such as logistics and marine management.



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Maritime Education in Malaysia

Undergraduate degrees being offered in specific areas such as

- marine technology and engineering
- maritime business and management,
- nautical science and technology
- maritime law
- logistics.



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Maritime Education in Malaysia

Undergraduate degrees being offered in specific areas such as

- marine technology and engineering
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- logistics.
- [Table 1](#): Marine design, manufacture, construction, technology & engineering at local IHLs.
- [Table 2](#): Marine clusters served by the respective programs



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Maritime Education in Malaysia

Problems:

- similar program been offered in different universities,
- overlapping of program names,
- similar subject contents and curriculum,
- competition between universities to hire limited number of expertise
- competition of limited budget/allocations to expand maritime teaching and research facilities.



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Maritime Education in Malaysia

Hence:

- Ministry of Higher Education (MOHE) commissioned a study to review the status and chart the course of Maritime and Marine Science education at IHLs in Malaysia.
- Aim: Recommend actions necessary to ensure Malaysian Maritime Studies graduates are adequately prepared for the future.
- Expected Output: National Maritime Education Blueprint to help MOHE, IHLs and related agencies to work together in charting the future direction of the maritime education and training in Malaysia



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Maritime Education in Malaysia

Quality, Benchmarking and Accreditation

- Benchmarking a must to ascertain the relevancy of our curriculum and delivery methods e.g. the Philippines APEC-wide benchmarking.
- Present philosophy: Outcome-based education.
- Ensure proper accreditation under the Malaysian Qualifications Agency (MQA), Engineering Education Council or the Marine Department of Malaysia for courses under Standards for Training and Certification of Watchkeepers (STCW).
- A National Board of Maritime Studies which has similar functions to Malaysian Board of Engineers or Malaysian Chartered of Accountant should be established.



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Maritime R&D in Malaysia

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The Importance of R&D

- Experience in Korea, Japan and elsewhere - R&D and innovation spur the development of their maritime industries.
- Development of the Korean shipbuilding industry due to growing importance of R&D and innovations, both at the large shipbuilding companies, as well as at research institutes and universities related to shipbuilding technology.
- Japanese and later the Korean shipyards established their own R&D centres.
- IHL must do research. Close and indispensable relationship between research and teaching.



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Scientifically Proficient Countries	Scientifically Developing Countries	Scientifically Lagging Countries
Singapore New Zealand Spain Ukraine Poland Azerbaijan Cuba China Brazil Portugal South Africa India	Uzbekistan Argentina Chile Mexico Pakistan Turkey Venezuela Iran Kuwait Hong Kong, China Egypt, Arab Rep. Indonesia	Malaysia Uganda Thailand Togo Jordan Tunisia Philippines Saudi Arabia Vietnam Ecuador Botswana Jamaica

Source: Caroline S.Wagner, Irene Brahmakulam, Brian Jackson, Anny Wong, Tatsuro Yoda, **Science and Technology Collaboration: Building Capacity in Developing Countries?** RAND Corporation, Santa Monica, 2001



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Maritime R&D in Malaysia

R&D Capacity Building and Rationalisation of Resources

- a. Marine ship model testing lab (towing tank) in UTM
- b. Ship handling simulator in ALAM
- c. Training ship in ALAM
- d. Research vessels at UMT
- e. Ship design and analysis software in various IHL
- f. Marine power plant laboratory in PUO
- g. Coastal Engineering Tank at NAHRIM



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UTM Experimental Facilities



Tun Dr. Mahathir and Datuk Seri Najib, visiting Marine Technology Laboratory in August 1999.

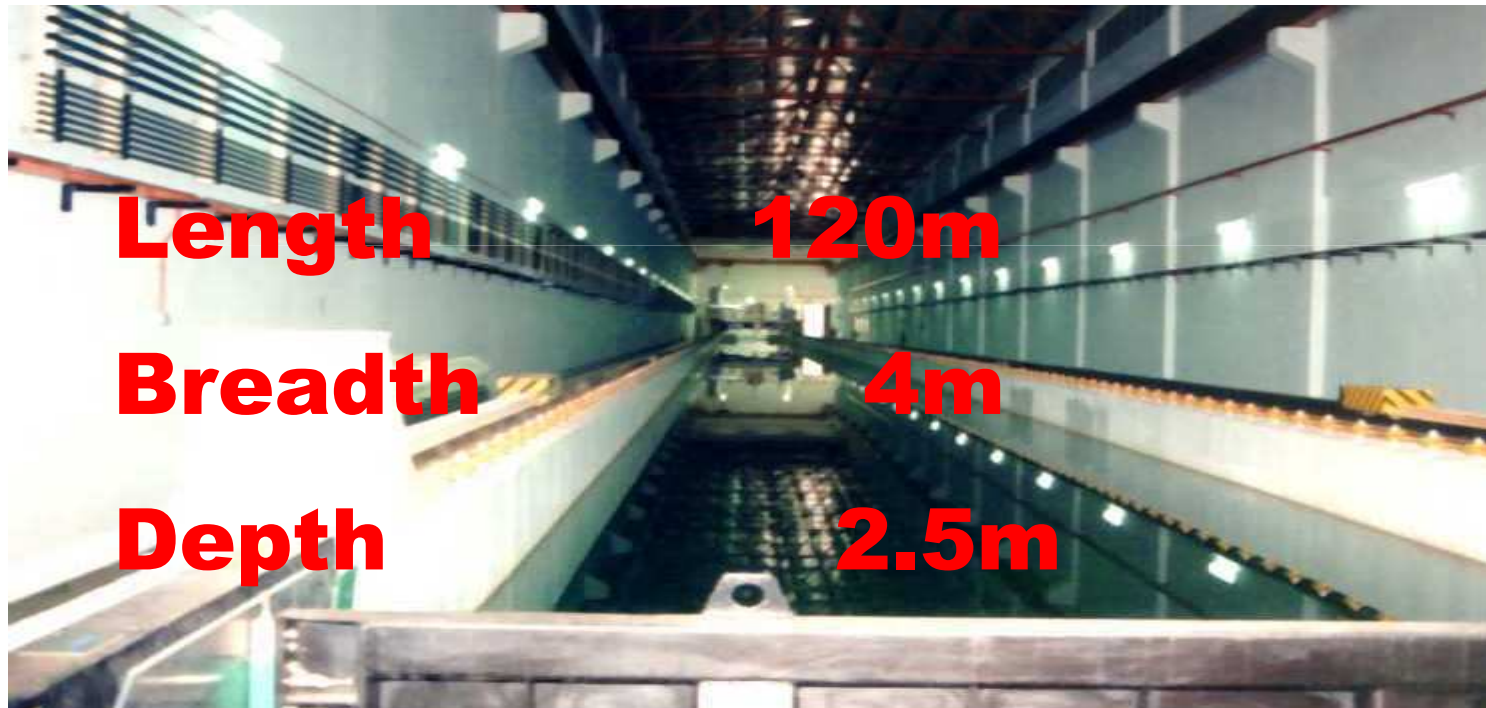


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UTM Experimental Facilities

Towing Tank





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Towing Carriage





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Fast Patrol Craft Tests





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Lifelong Maritime Career and Continuing Education

Problem of attracting people to the maritime industry especially to be seafarers is a world-wide issue.

The current thinking is towards a comprehensive career and academic development for seafaring and shore-based employment.

According to a European Union Recommendation, *“It will become easier to overcome the chronic shortages of recruits to sea-going professions if a thriving shipping sector is able to offer attractive wages and conditions and if coherent career paths can be offered through suitable training and enhanced possibilities for job mobility across the maritime sector”*

European Union, European Maritime Policy: Jobs, accessed 25 February 2010,
http://ec.europa.eu/maritimeaffairs/pdf/thematic_factsheets/jobs_en.pdf



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Lifelong Maritime Career and Continuing Education

Various approaches in developing lifelong career of seafarers is given in Barrie Lewarn (2009).

A proposal of maritime education pathways in Malaysia based on MQF is shown in the [Figure 1](#).

This gives a clear guide and a big picture of maritime higher education and training and career plans.

Barrie Lewarn, A review of some solutions to the shortage of maritime skills, Occasional paper No.1 Maritime Transport PolicyCentre, Australian Maritime College, 2009



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Lifelong Maritime Career and Continuing Education

Post-graduate Studies

Development of more R&D personnel can be done through post-graduate studies.

Entrées to the maritime world including (seafarers) need to look beyond Diploma or Bachelor degree levels, in fact aim as high as masters and Ph. D qualifications

Need incentives for such self-improvement activities, particularly at post-graduate levels.



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IHL-Industry Collaboration

Ref. [5] describes collaboration between the Korean shipbuilding industry and IHLs in the development of the marine industry.

Korea's largest shipbuilders, the main shipbuilding engineering departments at universities and public research establishments jointly develop several projects, financed by industry itself.

Government set up the Korean Marine Equipment Research Institute (KOMERI), based at the Korea Maritime University in Busan, carrying out R&D activities jointly with yards and suppliers in Gyeongnam.

Robert Hassinka and Dong-Ho Shinb, South Korea's Shipbuilding Industry: From a Couple of Cathedrals in the Desert to an Innovative Cluster, Asian Journal of Technology Innovation 13, 2 (2005), pp. 133-155



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IHL-Industry Collaboration

60% of the budget is provided by the central and local government, whereas about 40% of the income comes from companies.

A similar arrangement can be made in Malaysia where a National Ship Design Centre can be set-up in a local University to spur innovation and technology development, supported by the government and the private sector.

In developing local capability:

- Must be willing to communicate, cooperate, collaborate
- Need to have faith and confidence.
- Put national interests first.



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Dissemination and Extension of Knowledge

Traditionally through short-courses, workshops, public lectures, seminar, conferences, publications.

Now new philosophy of sharing through the web by forming Institutional Repository (IR).

IR is an online digital resource of a particular University/Institution. Research outputs in the form of academic papers, theses and dissertations etc. are shared with the whole world.

The Ranking Web of World repositories

(<http://repositories.webometrics.info>) ranked top 400 IR and Universiti Teknologi Malaysia IR (<http://eprints.utm.my/>) does

Malaysia proud when it was ranked among the top 100 at no 89.



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Concluding Remarks

The higher maritime education will continue to grow and develop.

Malaysia will gradually develop this level of education as the universities are able to obtain the necessary teaching skills and have the industry to support the graduates once they have completed their courses.

Maritime IHLs have to ensure that the people manning the world's ship today and in shore-based industries are alert, motivated, competent and qualified to the standard and highly educated with advanced knowledge.

Therefore, Malaysia must continue to develop and maintain a strong supply of maritime professionals for the future survival of our maritime industry.

There is a need to work together to strengthen local capability.



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Thank You