

The Royal Institution of Naval Architects



Education & Professional Development of Engineers in the Maritime Industry



International Conference
Education & Professional Development of
Engineers in the Maritime Industry
20-21 September 2016,
Holiday Inn, Singapore

Sponsored by:



www.rina.org.uk/EPD2016

For further information:
Call Catherine on +44 (0) 20 7235 4622 or email conference@rina.org.uk

DAY 1 PAPERS:

- 09.00-09.25** COFFEE AND REGISTRATION
- 09.25-09.30** Welcome Address
- 09.30-10.05** KEYNOTE, Prof Richard Birmingham, Newcastle University

10.05-10.40 **PARA-PROFESSIONAL ENGINEERING PATHWAYS FOR MARITIME ENGINEERING**, *Mark Symes, Australian Maritime College, Australia*. The Australian Maritime College (AMC) has embarked upon the development of an Associate Degree in Engineering in order to fulfil the industry need for maritime engineering associates. This paper sets out the development and implementation of an Associate Degree in Engineering (Maritime) for the Australian industry. Recent reports have described skills shortage in all occupational levels in the maritime industry from tradespeople to engineering paraprofessionals and professionals. Traditionally the primary educational activity in Australian Universities' engineering schools is the education of four-year Bachelor of Engineering graduates to enter practice as Professional Engineers. There are several activities that can address engineer shortages, for example developing engineering pathways for non-traditional entrants into degree programmes, increased support for studying students, and increasing the participation of under-represented groups. This paper describes some of the key features of the engineering pathway program offered at the Australian Maritime College, in particular the two year Associate Degree in Engineering (Maritime) in addressing the perceived shortages in Para-professional in the maritime sector.

- 10.40-11.10** COFFEE

11.10-11.45 **THE "STICON" START-UP CONCEPT - THE MARITIME ANSWER TO INNOVATION & MAKE IN INDIA BY CUSAT**, *K Sivaprasad, Associate Professor, Dept. of Ship Technology, CUSAT, C.G Gautham Krishnan, Ballast Engineer, ALE Middle East LLC*. India is making huge strides in development both technically and financially. Blessed with a strong population base of which youth constitute the major chunk, and the plethora of options and opportunities to be explored there is no doubt that the Indian production, services and technical sector will bloom and boom. The cycle of this big boom is still in the grassroots, which can be burgeoned by the induction of schemes such as "Make in India", "Start-up India" and "India Innovate", as they can also redefine the knowledge and skills of youth in creating jobs and entrepreneurs, besides opening new business opportunities. The vibes of these will surely be evident in the Marine sector, which is yet to be redefined. STICON (Ship Technology Industrial CONSultancy), a start-up venture by the students of Department of Ship Technology, CUSAT fostered by DESCON, the Consultancy wing of Department of Ship Technology, and supported by the current faculty of the department and some of its alumni is taking its baby steps in stepping up to this challenge and redefine the scope and quality of Maritime technical services offered to the society, and at the same time offer students technical and managerial experiences hands-on. The paper presents the activities of STICON, and how the start-up entity seeks and aims to outline change in society through the same whilst converting the knowledge of students into practical solutions and the future objectives of STICON & its potential to revolutionize change.

11.45-12.20 **INTERNATIONAL COLLABORATIVE WORK TO IMPROVE RESEARCH QUALITY AND ENHANCE ACADEMIC ACHIEVEMENT**, *I K A P Utama, Institute of Technology Sepuluh Nopember (ITS), Indonesia, B Ganapathisubramani B Nugroho, University of Southampton, UK, N Hutchins, J P Monty, University of Melbourne, Australia, F A Prasetyo, Indonesian Bureau of Classification (BKI), Indonesia, M Yusuf, PT Dharma Lautan (DLU), Indonesia, M Tulberg, Hempel International Inc., Denmark*. An international research collaboration, funded by Newton Fund 2015-2017 research scheme, is being carried out and involves six institutions from three continents and four countries and those are: Institute of Technology Sepuluh Nopember (ITS), Indonesian Bureau of Classification (BKI), and Dharma Lautan Shipping Company (DLU) from Indonesia, the University of Southampton from United Kingdom, University of Melbourne from Australia, and Hempel International Inc from Denmark. Those six institutions represent higher education institutions, ship classification, shipping company, and painting company. Focus of research is to understand the growth of marine bio-fouling on ship-hull and its effect to ship performance based on boundary layer theory. Overall, the current paper explains the advantages of collaborative work to all parties and in particular to ITS which includes two master students as part of the effort of ITS to be a world-class research university. Keywords: collaborative work, higher education, ship classification, shipping company, painting company.

- 12.20-13.20** LUNCH

13.20-13.55 **AN INTERDISCIPLINARY APPROACH TO EDUCATION: CASE STUDY OF AN ACADEMIC EXCHANGE**, *Jean-Baptiste R. G. SOUPPEZ, Lecturer in Yacht Design and Composite Engineering, Southampton Solent University, UK*. With the increasing cost of education, employability and student experience has become a priority in higher education. Recent years have seen a strengthening of the relationships between academia and industry, as well as an increasing number of academic partnerships between similar institutions at an international scale. This paper will present a new approach to education in the marine industry: an interdisciplinary exchange between two radically opposed institutions. The first exchange of a now established partnership between Southampton Solent University and the International Boatbuilding Training College Portsmouth saw a one week swap between yacht designers and traditional boat builders. The former were involved with a range of traditional boat building techniques, from the use of hand tools to steam-bending, while the latter were introduced to practical advanced composite

manufacturing as well as a wide scope of theoretical topics inherent to yacht design. The case study of this academic partnership will present the syllabus developed and highlight the benefits of interdisciplinary exchanges. Based on the students' experience and feedback, the improvements made to this particular program for the future will be detailed. Finally, conclusions will be drawn on the relevance of interdisciplinary exchanges in the marine industry, and how to maximise the learning outcomes.

13.55-14.30 **MARITIME DEGREES AND PROFESSIONAL DEVELOPMENT THROUGH DISTANCE E-LEARNING: A CASE STUDY OF AN INTERNATIONAL LEARNING ALLIANCE**, *Dr Richard Thain, Chief Executive and Academic Director, Marine Learning Alliance, David Kelly, Director, AsiaPac The Institute of Marine Engineering, Science and Technology*. The global shortage of engineers in all disciplines has been well documented, and existing provision of engineering programmes within the traditional full-time residential university sector is not keeping up with demand. For many prospective students, or working engineers who are required to undertake continuous professional development to maintain their professional registration, full-time classroom based attendance for education and training can be an issue. Financial, geographical or time constraints frequently create barriers to participation. The growth of niche, specialist providers of education using innovative methods of design and delivery can provide a viable and effective solution to these issues. The Marine Learning Alliance (MLA) brings together industry, academia and a professional body to develop and deliver Bachelors and Master's degrees, and also professional development courses which are highly relevant to the needs of maritime employers. Using a technology-enhanced delivery platform which provides 'anytime anywhere' access to learning materials, MLA has developed methods of design, production and delivery which offer the multimedia-rich experience that today's student seeks, whilst maintaining academic quality and standards. This is a critical balance to achieve, and requires much more effort than simply repurposing existing content from residential courses into a form of e-learning. This paper presents a case study of a highly successful international learning alliance. The experience of designing and delivering Master's degree and professional development courses by distance e-learning is discussed, together with the benefits which can be afforded by such a model.

- 14.30-15.00** COFFEE

15.00-15.35 **ACHIEVING SUCCESS WITH BLENDED LEARNING IN MARITIME EDUCATION: A DESIGN BASED APPROACH**, *Mark Symes, Australian Maritime College, Australia*. The Australian Maritime College (AMC) has a major objective to innovate and build better practice in e-Learning by developing a high quality blended learning approach to learning for anyone, anytime, anywhere. One strategy that the AMC has undertaken to achieve this is to develop a Blended Learning strategy project utilizing the latest technology. To gain maximum long-term benefit from this project it is essential to develop an evidence based approach, studying each initiative's effectiveness and derive learning and teaching (L&T) principles for using technology within the maritime context. This paper describes a project to explore, implement and document e-learning principles relevant to the maritime education context. The project uses an educational design-based approach. At conclusion of the project it is expected that a number of learning designs and guiding principles for maritime education will be developed.

15.35-16.10 **A STUDY ON THE DEVELOPMENT AND IMPLEMENTATION OF MASSIVE OPEN ONLINE COURSES IN MARITIME EDUCATION AND TRAINING**, *Iman Figrie B Muhammad, Modular, Offshore and Safety Training Department Wilfredo Erenio Yutuc, Advanced Marine Engineering Department Malaysian Maritime Academy (ALAM)*. Due to technological advances, global issues and new regulations in the shipping industry, the seafarers are tasked to constantly remain current and comply with the required industry standards by ensuring their competencies are updated. For the purpose of creating another platform for the seafarers to meet and accomplish this requirement, this paper studied the development and implementation of Massive Open Online Courses (MOOCs) in Maritime Education and Training (MET). The approach considered instructional design strategies (ISD) and methodology, target audience, type of training, content, evaluation and assessment schemes. Furthermore, the significant barriers in MET have been discussed including the current issues and challenges faced in the maritime industry. Given these complexities for MOOCs and considering the expected outcomes for both the seafarers and the maritime industry as a whole, the process may seem wearisome. Also, its immediate implementation may negatively impact the expected performance outcomes of the entire system as it currently stands. However, the long term benefits of a properly structured MOOC, being a learning management system (LMS) or e-learning platform, should be seen to overcome this setback and serve its intended purpose effectively. This paper presented a MOOC model specifically designed to conform with the requirements of the International Convention on Standard of Training, Certification and Watchkeeping for Seafarers Manila Amendment (STCW 2010). Key words: Learning management system; Maritime education and training; Massive open online course; Instructional design strategies

- 16.10-16.30** **MODERN MARINE COATING**, *Lokesh Dhamija, International Paint, Singapore*

- 16.30-** **GENERAL DISCUSSION & EVENING DRINKS RECEPTION**

09.00-09.30

COFFEE AND REGISTRATION

09.30-10.05

INNOVATIVE CONCEPT OF MEMORANDUM OF UNDERSTANDING BETWEEN UNIVERSITIES AND COMPANIES, Paula Michima, UFPE, Brazil.

The Naval Engineering course in Pernambuco Federal University (UFPE) was created recently in 2007. Since its creation a big effort has been addressed to offer to the students opportunities to get practical experiences especially in shipbuilding-related knowledge. Some approaches were done nation- and worldwide to establish partnerships and collaborations with organizations that would somehow help guarantee a higher quality education and early contact of our students with the professional environment. The special case to be reported is the successful combined approach of a student academic exchange and internship in national and international activities, which inspired an innovative broader partnership concept under evaluation. As an extension of the actions already being executed through the close relation with the local shipyards, such as Engineers coming to teach complementary, field classes, courses in loco and internships, reported in (Melo et al., 2015), a more ambitious approach of search for opportunities is to be made. One of the local shipyard belongs to an international group, with several branches around the world, including one in Norway. Although the collaboration with the shipyard is restricted to the local activities, the special combined effort by UFPE, Aalesund University College (HIALS) and that shipyard resulted in extending a regular academic exchange activity to an internship at the Norwegian shipyard, followed by an internship at the Brazilian unit. Inspired on that model, and searching for a more comprehensive exchange of knowledge, a new model of memorandum of understanding involving the two companies and Universities is proposed.

10.05-10.40

DEVELOPING AND MAINTAINING A COOPERATIVE EDUCATION PROGRAM IN MARITIME, Mark Symes, Australian Maritime College, Australia.

With ever increasing pressure on higher education providers to produce more "work ready" graduates whose attributes provide a good match to what employers want. Work integrated learning (WIL) or Co-operative education (COE) programmes are becoming common. In the media and from industry itself, we constantly hear about the critical shortage of skilled employees, particularly in the fields of technology, science, math and engineering. In an attempt to address these concerns the institute set out to develop and promote the COE programme. Our study explores the key factors associated with development, sustaining, and implementation of a co-operative program and the challenges faced keeping multiple stakeholders satisfied. T Industry showed a preference for senior students with greater academic progress over junior students, which contradicts the stated need for development of professional skills. Regional engineering firms offered placements to junior students due to the lack of response from qualified personnel, yet still benefited and developed professional skills within the undergraduate students. Current academic programs within the institute place a high value on professional skills in conjunction with Engineers Australia's graduate attribute requirements. It is imperative that academia, industry and accreditation bodies work together to not only provide value-adding for industry but also ensure a secure, and continual stream of students gaining access to professional skills obtained through mentoring relevant to the current 'coal-face' of industry.

10.40-11.10

COFFEE

11.10-11.45

BOUNDARY CONDITIONS BETWEEN UNIVERSITY AND INDUSTRY

Benjamin Pleguezuelos AMRINA Naval Architect. In the university educational system, for many years now, an effort is being made, growing day by day, to blur the distinction between "education" and "profession". Why must there be a line?, and why is there not more interaction between Industry and University? The maritime trade needs to be open to the idea, of the fact, that recruitment might begin in the university and that some different optional subjects of study, could be subsidized by companies, and this could lead to utopia. More and more the university and real life, should approach and nurture one another. Understanding university as a universal and social good, from which everyone can benefit, could help to find resources and encourage investment. Improvements in working together: education programs in the university, with related links to professional industries, could provide and bring advantages. The old idea that university is a closed place, only for some privileged people with discrete studies, has changed in order to be accessible. And this is the most important achievement of recent times. Understand some part of the studies, with some areas of study could be renamed or classified as the name of some professional products/subjects. In the same way, industry could create links with certain research departments in the university, developing training sectors and staying in constant contact with the university. This is the way, not only to improve our society, it is also the way to minimize and facilitate the transition from "Education" to the "Working World".

11.45-12.20

HUMAN RESOURCE DEVELOPMENT IN NAVAL AND OFFSHORE ENGINEERING: PARTICIPATION OF STUDENTS IN THE INTERNATIONAL BOAT CONTESTS, Armando Hideki Shinohara, Ayako Ono, Hissae Fujiwara, UFPE - Federal University of Pernambuco, Center of Technology and Geoscience Department of Mechanical Materials and Naval Engineering.

Aiming the development of high level human resource for shipbuilding industry and education, due to the lack of experts in this field in Brazil, international agreements have been established with top Finish Universities (TUAS, SAMS, LUT), The University of Tokyo, National University of Yokohama of Japan, shipyards that have resulted delivery of several intensive courses by experts in welding, productivity in shipyards, fracture mechanics, propulsion systems, ship design, hydrodynamics, composite materials. Furthermore, to improve skills of students in design, construction and performance of ships, participations in the domestic and international contests have been also supported. So, since 2014, students of UFPE have been participated in the international boat contests in Switzerland ("Hydrocontest" in Lausanne) and in Japan ("Solar Boat Contest" in Biwa Lake), which required high level of knowledges and developments of skills in design and structure, construction, performance testing, propulsion and control systems, and

also the development in the team works, foreign language (French, Japanese, English) culture knowledge. In this presentation, the positive results and parts that should be improved and growth will be presented.

12.20-13.20

LUNCH

13.20-13.55

TRAINING OF NAVAL ARCHITECTS FOR INDIAN NAVY - A WIN-WIN PARTNERSHIP BETWEEN INDIAN NAVY AND COCHIN UNIVERSITY OF SCIENCE AND TECHNOLOGY, Cdr P Jayasanker, Indian Navy and Dr. K. Sivaprasad, Associate Professor, CUSAT.

The Indian Navy's foray into indigenisation began over five decades ago with the design and construction of warships in the country. Today, forty eight of its state-of-the-art ships and submarines are under construction in Indian shipyards, both public and private, a clear reflection of the Indian Navy's enduring support to India's indigenous warship building endeavor. These indigenous design required a well trained manpower to undertake the preliminary design of ships and submarines. The Directorate of Naval Constructors which was established in 1954 with a small team of 5 Naval Architects has now expanded to a versatile design department in the Navy that is capable of designing all types of ships and submarines. The availability of qualified Naval Architects was an impediment that plagued the expansion of the design office in 1970s and after much deliberation a unique tie-up was put in pace with Cochin University of Science and Technology (CUSAT) in 1987. The agreement envisaged training of the Naval Cadets along with other students in a Bachelor of Technology course in Naval Architecture and Ship Building at the Department of Ship Technology. The partnership also envisaged Naval officers of the Corps of Naval Constructors being a part of the faculty in the university. After almost 30 years of this partnership and its success reflected in more than 200 Naval Architects serving the Indian Navy after graduating from CUSAT, this is a relationship that has endured time. This paper analyses the intricate relationship of CUSAT with Indian Navy which has been a win-win partnership.

13.55-14.30

MARITIME TRAINING SHIP "A NEW PERSPECTIVE OF STANDARD MARITIME TRAINING FOR A GLOBALLY COMPETITIVE SEAFARER, Hughes Rodolfo A. Brigoli, B.S. Naval Architecture and Marine Engineering Student-University of Cebu, Philippines, Jacklyn R. Antolihao, Naval Architecture and Marine Engineering Instructor - University of Cebu, Philippines.

This study aims to standardize the Filipino seafarers in consonance to the adoption of the comprehensive amendments to the 1978 International Convention on Training, Certification and Watchkeeping for seafarers - know to us all more conveniently as the STCW Convention. To meet the global competence in the shipping industry and in order to produce a well-trained seafarers to ensure safety of life at sea, maritime security, efficiency of navigation and protection and preservation of the marine environment. This study will integrate the maritime training facilities on shipboard that will realize the actual scenario of the ship during the span of the training. The ship will serve as a "floating maritime training center" that will be equipped with facilities to meet the STCW Convention requirements. The ship can also navigate within the Philippine waters and dock in every port of the Philippines to ease the transportation means of the seafarer or apprentice. This study will help realize to meet the deadline of STCW implementation as mandated by the International Maritime Organization (IMO) and most of all to help in becoming globally and morally competent seafarers in the shipping industry.

14.30-15.00

COFFEE

15.00-15.35

HUMAN RESOURCE DEVELOPMENT IN NAVAL AND OCEAN ENGINEERING: EFFECTIVENESS OF THE PROJECT BASED LEARNING (PBL), Ayako Ono, Armando Hideki Shinohara, Hissae Fujiwara, UFPE - Federal University of Pernambuco, Center of Technology and Geoscience Department of Mechanical Materials and Naval Engineering.

In order to prepare new engineers, young researchers and scientists, future professors to support these new businesses in the Suape Industrial Complex, new courses (undergraduate and graduate for master and doctor program) related to naval and ocean engineering at Federal University of Pernambuco (UFPE) have been started. One of method adopted at UFPE with the financial support of human resource development in shipbuilding technology is the project based learning (PBL), a model that organizes learning around projects. Projects resolutions provide to the students, young researchers and assistant teachers the opportunity to bring together knowledge-based skills, including key concepts, principles, and theoretical models, and apply them to real-life problems and scenarios. These activities help reinforce existing knowledge while providing a context to newly learned theory. Up to now, four PBL courses have been conducted by Professors expert in the field of shipbuilding from The University of Tokyo, experts from the shipyards of Japan, and the results will be presented.

15.35-16.10

PROJECT MANAGEMENT TRAINING, (SHORT COURSE) BY MANAGERS, FOR MANAGERS, Mick Thurlbeck, Stapleton International Pte Limited, Singapore.

Stapleton International is a leading edge consultancy providing service solutions to the Engineering and Construction Industries. Since 1972 to the present day they have developed expertise in management, engineering, quantity surveying, planning and legal professions. Now, in collaboration with the University of Sunderland, they have developed a Project Management Training Programme to be delivered in a modular format which is designed with basic and advanced levels. This exciting new initiative will facilitate the transfer of knowledge and experience of Lessons Learned to both individual and corporate delegates. Stapleton International have recognised the need for vocational, practical oriented and accredited project management courses. There is also a need to train junior, existing and potential project managers in more effective advanced leadership of projects in complex multi-cultural and multi stakeholder environments that now exist for many major organisations. A collaborative approach between Stapleton International and the University of Sunderland has led to the development of structured workshops and training courses which satisfy this need.

16.10-

GENERAL DISCUSSION

