

**AN INVESTIGATION OF THE SKILLS GAP BETWEEN COURSE LEARNING  
OUTCOMES OF MARITIME BUSINESS DEGREES AND ONSHORE  
EMPLOYMENT REQUIREMENTS**

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**Abstract** This paper explores key industry perceptions, through interviews with 27 senior maritime managers in Australia, Canada and the US, on the employability skills required for onshore maritime professionals. Those perceptions are then compared to the skills identified from the collected nine Course Learning Outcomes (CLOs) of nine maritime business degrees. The findings show that CLOs and maritime industry requirements tend to converge in areas such as knowledge, self-management and computer/IT skills. Less alignment was evident in CLOs relating to communication and problem solving. By giving more attention to these two CLOS in terms of specific emphasis and depth of study, students will gain more comprehensive skill sets for these critical areas. This paper also recommends that including adaptability, flexibility and an inquiring mind in CLOs may enable students to better respond to the dynamism and complexity inherent in the maritime industry.

**Keywords:** Employability Skills, Course Learning Outcomes, Maritime Business Degrees, Onshore Maritime Industry

## **1. Introduction**

The onshore maritime industry, including ports, terminals and shipping companies, is a crucial contributor to the viability and sustainability of the maritime sector. Within this industry, there is a diverse array of skilled professional occupations and career pathways. Maritime business degrees are a well-recognised qualification to gain entry to employment in this industry, often undertaken by seafarers for example as a pathway to enable the transition from ship-to-shore by building on their experience at sea. Of interest, in seafaring there are professional standards that apply to the skill sets required, determined by international organisations such as IMO. However, for onshore business-related roles in ports, shipping, freight forwarding and ships agents, the key employability skills are unclear due to the diversity of job roles.

This paper explores key industry perceptions on the employability skills required for onshore maritime professionals and compares those perceptions to the skills identified in the Course Learning Outcomes (CLOs) of maritime business degrees. The focus of this paper is to identify whether a gap exists between the CLOs of maritime business degrees and the required employability skills in the onshore maritime industry. This paper commences with literature reviews on key employability skills in the maritime industry, and evaluates CLOs from seven IAMU and two non-IAMU maritime business degrees. Subsequently, following interviews with 27 senior maritime managers in Australia, Canada and the US, this paper identifies the required knowledge and employability skills for professionals in the onshore maritime industry. Finally, the paper highlights how universities may consider making changes to their CLOs of maritime business degrees to improve graduates preparation for working in the industry.

## **2. Employability skills and learning outcomes**

Employability skills are a set of skills ‘required not only to gain employment, but also to progress within an enterprise so as to achieve one’s potential and contribute successfully to enterprise strategic directions’ (Australian Chamber of Commerce and Industry & Business Council of Australia 2002, p.14). When integrating employability skills into undergraduate programs, universities develop graduate attributes at a university level, which are then made more specific at a faculty, discipline, and unit (subject) level (Precision Consultancy and BIHECC 2007; Australian Technology Network 2000; Sumsion and Goodfellow 2004).

Students undertaking bachelor degree programs expect to acquire not only generic employability skills but also discipline specific skills. Therefore, universities, especially

Australian universities, seek to facilitate graduates in gaining both skill sets by focusing on learning outcomes. Learning outcomes describe the skills and knowledge a student can attain by the end of the subject or course (Australian Qualifications Framework Council 2013). For example, the Australian Government and universities have implemented a series of discipline-related policies and standards that set out minimum learning standards for higher education courses. Both university level and discipline standards focus on addressing learning outcomes at course level. The CLOs refer to graduate outcomes of any university degree programmes specifying what students should achieve after graduate.

### **3. Literature review on employability skills for the onshore maritime workforce**

Academic literature related to workforce studies in the maritime industry mainly focuses on the offshore maritime industry such as seafarer skills, with limited research in onshore maritime workforce skill requirements. One study undertaken by Fernando, Sigera and Cahoon (2013) suggests that, in the Sri Lankan shipping industry, employees could attain greater success with skills in using computers and the internet, intuition and forecasting, analytical thinking, English language, customer service, time management, creative thinking, and the accuracy of work. In relation to the Taiwanese shipping industry, Han and Li (2015) found 11 employability indicators. Of interest, shipping-related firms in this study suggested that graduates from shipping management degrees needed to improve general business English proficiency, morality and virtue, Emotional Intelligence (EQ) management, and language expression in the languages used.

From a broader perspective, the Australian Transport and Logistics Council's annual environmental scan identified that the shipping and port sectors in Australia demand skills such as leadership and management, teaching and training, information technology, financial management, language, literacy and numeracy (LLN), problem-solving, analytical skills, and sophisticated contract management practices (Transport and Logistics Council 2015). However, as noted, a paucity of in-depth investigations of employability skills exists.

### **4. Examining CLOs of maritime business degrees in worldwide universities**

On completion of a comprehensive web search of maritime business bachelor degrees, including the eduMaritime and IAMU member websites, a total of 28 universities offering the degrees was found, of which 24 were IAMU members (10 European, 9 Asia Pacific, and 5 USA). From the 28 universities, only nine CLOs of maritime business bachelor degrees from the following nine universities could be obtained:

- Asia Pacific: Australian Maritime College, University of Tasmania (AMC); Hong Kong Poly University (Hong Kong); Dalian Maritime University (Dalian);
- Europe: Plymouth University (Plymouth); Liverpool John Moores University (Liverpool); Southampton Solent University (Southampton); Dokuz Eylul University, Maritime Faculty (Dokuz); and
- USA: Massachusetts Maritime Academy (MMA); Texas A&M University (Texas).

Of the available CLOs, some are similar to those in general business degrees although indicating a specialised field i.e. maritime and logistics. Few degree programmes clearly identify skills in their CLOs, for example the BSc (Hons) Maritime Business (Southampton) addresses cognitive skills, practical, professional skills and transferrable and key skills in its CLOs. Others such as BSc (Hons) Maritime Business and Logistics (Plymouth) and BSc (Hons) Maritime Business and Management (Liverpool), separately include information on graduates' expected specific employment related skills, including professional practical skills and transferable skills. In this study, information on CLOs and employability skills collected from various universities were used for analysis to find skills expected for graduates of maritime business related degrees. Content analysis was applied in examining the collected CLOs. Consequently, the following 11 categories of skills inherent in the 9 available CLOs are identified in the subheadings below followed by the actual number of CLOs including each skills.

**Knowledge (9).** The CLOs split knowledge into general and specialised. General knowledge in most CLOs tends to expect application of general business knowledge to the maritime industry, whilst some specifically refer to management, financial management, marketing, human resource management, international business and analytical methods. In relation to specialised knowledge, some CLOs simply state it in a general way such as 'systematically and critically review a body of knowledge within the study and practice of maritime business and the maritime industry, including elements of new and specialised knowledge' (Southampton). However, few CLOs of programmes indicate specific maritime related knowledge, such as maritime business, ship finance, logistics, supply chain management, information systems, maritime policy, and transport geography. As each programme's course structure varies, ascertaining common critical knowledge for maritime business degree graduates is challenging.

**Communication (8).** One of the most common CLOs is written and verbal communication, which is an important inclusion to ensure graduates have skills to effectively communicate to

a wide audience. Students should be able to present a clear and coherent exposition of business management knowledge, concepts and empirical evidence relevant to the maritime and logistics related industries. Using modern electronic and multimedia technology for communication is essential for graduates. For programmes not delivered in English, such as from Dalian, graduates are expected to be able to communicate internationally through foreign languages.

**Critical thinking (9).** All programmes' CLOs require students to demonstrate critical thinking, an intellectual skill individually and within teams. Critical thinking is 'the intellectually disciplined processes of actively and skilfully evaluating information and conceptualizing a solution, through tools including observation, experience, reflection, reasoning, or communication, as a guide to belief and action' (Scriven & Paul 1987 in the Critical Thinking Community Skills 2017). Skills used in critical thinking include analysing, synthesising, evaluating, observing, reflecting on possible outcomes and creative and innovative thinking from various sources in the field of maritime business and logistics related areas. By using critical thinking skills, students are able to anticipate and solve problems, enhancing their problem solving skill, which is also one of the important skills embedded in CLOs.

**Problem solving skills (8).** Problem solving is applied in programs to develop solutions to diverse problems in the maritime business world and involves analytical and creative skills. The majority of programmes' CLOs indicate that maritime business students should be able to recognise problems in the maritime and logistics related fields, analyse information, evaluate and appraise solutions, and draw appropriate conclusions and recommendations for maritime business needs. In addition, students should be able to use decision support tools, quantitative techniques and IT skills to analyse complex information and data for solving problems.

**Self-management (7).** CLOs of seven programmes identify expectations that students should be able to be responsible for their learning such as managing time and tasks; demonstrate autonomy and accountability in deterring and achieving personal and group objectives; and reflect their performance feedback to identify and action learning opportunities and self-improvement. These expectations are referred to as self-management skills in which students work and learn independently and take responsibility for personal actions.

**Social responsibility/ethics (5).** Five programmes' CLOs clearly indicate that students should be aware of professional ethical conduct and understand the concept of social responsibility in relation to social, cultural, economic and environmental issues.

**Team work (5).** Five CLOs require students to work collaboratively with others from different disciplines and backgrounds to formulate solutions to complex problems, including leading a team activity, whilst showing responsibility, professional behaviour and mentoring skills.

**Computer/IT skills (5).** Five programmes' CLOs indicate that students should understand the applications of information systems in a variety of contexts related to business and transportation, and utilise computer and information management skills for data analysis and maritime business and management purpose.

**Global perspective (4).** Four CLOs address that maritime business graduates should develop a diverse and global perspective to work in a global society as well as demonstrate a global outlook and understand cultural diversity, globalization and their implications for business.

**Research skills (3).** Three CLOs require students to conduct a research project related to maritime business or logistics issues. Students should demonstrate the skills necessary to plan, conduct and report an original research. Despite some programmes' CLOs not mentioning research skills, they do require students to complete a research project in their programme, for example, the Maritime and Logistics Management degree at AMC.

**Experiential learning (2).** Two programmes including BSc (Hons) Maritime Business (Southampton) and Bachelor of International Maritime Business (MMA) respectively have included experiential learning in their CLOs. Through experiential learning, students have unique opportunities for further integrating, applying and sharpening their shipping and business knowledge and professional skills.

In summary, CLOs in maritime business related degree programmes describe expectations that graduates should have a broad and coherent general business and maritime business related knowledge and be able to apply the knowledge to professional work. Graduates should also have cognitive skills such as critical thinking; practical skills such as problem solving, research skills, application of knowledge; and transferable skills including communication, self-management, teamwork, use of computer and IT skills in maritime business and management. In addition, graduates should be able to demonstrate a global perspective, and conduct themselves in a professional, socially responsible and ethical manner in life and business.

## **5. Employability skills of the onshore maritime industry-interview findings**

In order to explore the employability skills required by employers in the onshore maritime industry, the research team conducted focus group and individual interviews with 27 senior

industry managers in Australia, the US and Canada. In Australia, the team conducted two focus group meetings with six participants in Melbourne and four in Sydney respectively, and five face to face and two telephone individual interviews. The research partner in Texas undertook five individual interviews through face to face and telephone; the partner at Memorial conducted a focus group interview with five industry participants. The participants worked in the sectors of shipping, port and terminal, freight forwarding, trading, logistics, chartering and brokering, ship management and ship agency. Their positions in the workplace included CEO, managing director, director, human resource manager, division manager, and functional managers. The major questions asked in interviews included: (1) key employability skills necessary for graduates to succeed in maritime-related organisations; (2) most important employability skills of a recent graduate from a maritime business degree; (3) skill differences between a business graduate and a maritime business graduate for a graduate position; and (4) key employability skills necessary for graduate success in 10 years' time. This paper uses the findings from questions 1 and 2 to identify current skills required of maritime business graduates to compare with those embedded in the CLOs.

As each participant worked in separate areas of the maritime industry, the identified knowledge and skills varied depending on their sector involvement, although the following 9 skills and knowledge represent those deemed important by interviewees. Each subheading also indicates the number of responses for each skill and knowledge.

**Communication (27).** This was unanimously identified as the most important skill. The maritime industry is global and requires employees to communicate clearly and concisely with customers in other countries that speak different languages and possess different cultural values. Communication includes empathy, active listening, written (email, letter, reports), and verbal skills (face to face; telephone communication). Today's graduates must be able to communicate effectively in all electronic forms including email, formulating spreadsheets, creating presentations, and compiling data in effective and concise manners, in addition to person-to-person effective communication. Communication skill requirements differ between levels and the role of employees in the organisation. For example, in the head office of a port company, significant written skills are required, whereas at the operational level oral communication is the core. Chartering and broking companies for example, also require good negotiating skills.

**Adaptability and flexibility (21).** These are highly required skills when working in onshore maritime organisations. The maritime industry is changing and the business has many moving parts needed to complete one goal, so graduates must be able to handle dynamism and



complexity. Therefore, employees should be adaptable to the ever-changing environment and have a good attitude towards learning to find new skillsets to meet future changes. They also need to be flexible in the work place, eg. being willing to move between jobs and to travel. Graduates who can progress through a broad exposure to a range of work activities and diverse environments, such as working overseas, are able to upgrade their skills. For instance, they can start improving their leadership skills by managing people in various cultures.

**An inquisitive mind (13).** Many respondents indicated they expect their employees to show interest and willingness in learning. Attitude towards learning is the most important strategy for meeting future changes in the industry. Respondents stated their interest in having graduates with the ability to self-motivate, find solutions on their own, and constantly learn. Employers are looking for graduates displaying the ability and initiative to research and find answers quickly and effectively on their own. Employees working in the field for longer periods will garner more knowledge and glean applicable information through on the job training; however, they must desire to learn more through self-motivation and self-reliance. With such a proactive attitude towards learning, employees will be able to experience a wide range of activities across the organisation and further their career.

**Self-management skills (18).** The majority of respondents stated that employees should have skills such as time management, the ability to prioritise tasks effectively, to cope with pressure, to learn on the job, self-reliance, and work ethics. A few interviewees also emphasised the importance of emotional intelligence in the work place. In addition, employees should be able to receive criticism and discern the difference between constructive and employment-jeopardizing criticism. This is particularly important to those new graduate employees, as they may tend to make more mistakes compared with incumbents.

**Analytical and problem-solving skills (22).** These skills are critical for daily operations in the on shore maritime industry. Employees should be able to think critically, holistically, collect data and analyse data to assist themselves or managers in decision-making.

**Interpersonal skills (16).** Interviewees emphasised such skills as being vital in the maritime industry due to the importance of relationship management. The skills required are to engage and build relationships with both stakeholders and staff from other departments.

**Computer skills (12).** Employees are expected to have basic computer literacy, proficiency in using software (in particular Excel), and technology to organise data and disseminate information.



**Team work (14).** Respondents stated that they require potential employees who can work in a team. They should be able to operate as a good teammate through cooperation, communication, and playing multiple roles to achieve the objective of teamwork.

**Knowledge.** Interviewees indicated various knowledge, relative to their specific areas, necessary to work in the onshore maritime related organisation (See Table 1 below). The bracket indicates the number of responses for each knowledge.

**Table 1** Knowledge necessary to work in onshore maritime related organisations

General business knowledge	Specific maritime business related knowledge
<ul style="list-style-type: none"> <li>- Financial accounting (10)</li> <li>- Financial management (4)</li> <li>- Marketing (2)</li> <li>- International trade (7)</li> <li>- Commercial law (5)</li> <li>- Systems concept (2)</li> </ul>	<ul style="list-style-type: none"> <li>- Shipping business operation and management (24)</li> <li>- Port operation and management (11)</li> <li>- Stevedoring operation (2)</li> <li>- Maritime geography (1)</li> <li>- Logistics and supply chain management (10)</li> <li>- Transport systems including intermodal transportation (14)</li> <li>- Maritime law (7)</li> <li>- Project management (12)</li> <li>- Naval architecture (1)</li> <li>- Documentation for exporting and importing (6)</li> <li>- Marine insurance (1)</li> <li>- Overview of the maritime industry (13)</li> <li>- Freight forwarding (5)</li> <li>- Information Communication Technology (ICT) in the maritime industry (11)</li> </ul>

**6. Skills gap between CLOs of maritime business degrees and industry requirements**

Considering the CLOs of the nine programmes studied and the information provided during the face-to-face interviews, it is suggested there are some strong similarities in the skills required by industry and CLOs. An example of this is general business knowledge, such as financial management and marketing being required by the industry, in addition to specific information relating to the maritime industry and logistics. Other similarities were evident in discussions related to the categories of self-management, team work and computer/IT skills. There were three study areas included in CLOs not mentioned by industry interviewees - ethics, a global perspective, and experiential learning. It may be that these skills are taken for granted by industry or are of little importance and therefore not mentioned; or they may not be considered as something that can be taught. Alternatively, it may be that employers consider that these are areas of learning that should be taught on the job, after completion of a study programme.

Some areas appeared to have a different focus when comparing the CLOs and listening to industry viewpoints. Firstly, analytical and problem-solving skills were seen by industry to include critical thinking and research; the impression given was these are a body of skills that need to be integrated and cohesive, not separated. Noticeably, industry was keen on graduates having inquiring minds, being interested and willing to learn. Fostering such skills may sometimes be assumed in universities, with little emphasis given to engaging students in the processes of learning by inquiry in CLOs.

Secondly, communication as a category is far more refined in industry's views than is shown in CLOs. The requirements are far more specific and given greater importance by industry. Unquestionably, industry is keen to have graduates that are skilled in all aspects of communication, not only written and verbal skills but also in active listening, negotiating skills and being proficient across all electronic media. Interpersonal skills are also included by the industry as necessary and can be developed through effective delivery of communication-related studies. More emphasis on broader communication skills in CLOs may benefit industry.

A key skills gap in CLOs is adaptability and flexibility. The maritime industry is dynamic and complex; it is vital that graduates can adapt and be flexible to further their careers in an industry where change is a given. A willingness to change roles or locations, to upgrade skills and see various perspectives is critical. Including adaptability and flexibility as a key CLO may assist universities to better meet industry requirements.

## **7. Conclusion**

In general terms, this paper highlights that there is further work to be undertaken by universities in developing CLOs. In particular, there is an opportunity to clearly articulate how their maritime business related undergraduate programs can prepare graduates for adapting to the rigours of working in the onshore maritime industry and being able to make early contributions to their chosen organisation. The comments in this paper are made tentatively because the CLOs of only 9 of the 28 universities could be found. Further research is required to fully investigate whether CLOs do in fact exist in the other 19 universities, perhaps using a different term to CLOs, or it may be that other universities either do not utilise CLOs to explain outcomes attained by graduates, or simply do not see the benefit in providing CLOs in a public forum such as on their website.

From a more specific perspective, this paper suggests that the available CLOs and maritime industry requirements tend to converge in areas such as knowledge, self-management and

computer/IT skills. However, modifying CLOs relating to communication and problem solving to give more specific emphasis, depth of study and focus may benefit industry as universities will be providing more comprehensive skill sets for these critical areas. Finally, including adaptability, flexibility and an inquiring mind in CLOs may increase the value of maritime business programmes to the dynamism and complexity that are inherent in the maritime industry.

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