Evaluating the Impact of AI Tools on the Performance of Maritime Trainees in METI

Prepared By

Ahmed Mohamed Aly Salem, Mohamed H. M. Hassan

Arab Academy for Science, Technology & Maritime Transport, AASTMT

المستخلص

تتغير صناعة النقل البحري كثيرًا بسبب التكنولوجيا الجديدة، واستخدام المزيد من الآلات، والأدوات الرقمية. ومن أجل الاستمرارية في التناغم، يجب على المؤسسات التعليمية البحرية تنفيذ تقنيات التدريس المحدثة التي تمكن الطلاب من اكتساب المهارات اللازمة لفرص العمل القادمة في هذا المجال. تستكشف هذه الدراسة كيف يمكن للذكاء الاصطناعي وتحليل البيانات أن يجعلا قياس المهارات في برامج التعليم والتدريب البحري أفضل وأدق.

يساعد الذكاء الاصطناعي وتحليل البيانات في جعل التعلم أكثر ملاءمة وفاعلية للأفراد، ويسمح بالتتبع السريع للتقدم والتطوير، ويمكنه توقع النتائج المستقبلية، حيث يوفر مساحة آمنة للمتدربين لاكتساب الخبرات بشكل أوسع. كما إنها ستساعد في الحكم على مدى جودة المتدربين في اتخاذ القرارات وحل المشكلات وأيضا استخدام قدراتهم الفنية المكتسبة. ومن خلال استخدام أدوات الذكاء الاصطناعي وتحليل البيانات، يمكن للمعلمين ومدربين معرفة الأجزاء التي يحتاج فيها الطلاب والمتدربين إلى المساعدة وتركيز، ووضع خطط تدريب مخصصة لكل طالب، وتخمين مدى نجاحهم في المستقبل.

استخدمت هذه الدراسة طرق بحث مختلفة. حيث تم النظر في الدراسات جديدة، والتحقق من الأمثلة المتاحة، كما تم تجميع المعلومات من المؤسسات التي تتولى التعليم والتدريب وتطوير المهارات البحرية. حيث توضح الدراسة كيف تجعل اختبارات الذكاء الاصطناعي مهارات الفحص والتقييم أكثر موثوقية ودقة وسرعة. وتُظهر النتائج أن استخدام الذكاء الاصطناعي وتحليل البيانات يحسن دقة التقييمات ويساعد في تغيير العملية التدريسية والتدريبية بما يلبي الاحتياجات الملائمة للتغيير المستمر في صناعة النقل البحري. وتساهم هذه الدراسة في تطوير استراتيجية تعليمية جديدة تهدف إلى تجهيز عاملي القطاع البحري لمواجهة التحديات التي تفرضها التقنيات الناشئة والمتطورة.

Abstract

The Maritime industry is changing a lot because of new technology, more machines doing work, and the use of digital tools. To stay important and useful, maritime schools need to use updated teaching methods that give students the important skills they need for jobs in the future. This study looks at how artificial intelligence (AI) and data analysis can improve the way skills are measured in maritime training programs, making the assessment more accurate, efficient, and complete.

AI and data analysis help make learning more tailored to individuals, allow for fast tracking of progress, and can foresee future outcomes. This helps us see what the trainees know and can do more clearly. These technologies are capable of replicating actual ocean environments, providing a safe space for trainees to gain experience. They help judge how good trainees are at making choices, solving problems, and using their technical abilities. By using AI tools and analyzing data, teachers can find out where students need help, make custom training plans for each student, and guess how well they will do in the future.

The study uses different methods. It looks at new studies, checks out examples, and gathers information from schools that teach maritime skills. It shows how AI tests make checking skills more reliable, accurate, and quicker. The results show that using AI and data analysis improves the accuracy of assessments and helps training change to meet the changing needs of the shipping industry. This study contributes to the development of a fresh educational strategy aimed at equipping maritime employees to face the challenges posed by emerging technologies and automation.

Keywords: maritime education, competency-based assessment, AI, data analytics

Introduction

Training and education in the maritime field are key for a strong and lasting shipping industry. It supports the education of people to acquire expertise in professional roles within business and other areas.As global trade and shipping become more complicated, there is an increasing demand for new ideas in Marine Engineering Technology (Sharma & Nazir, 2021). It's important for businesses to have skilled and adaptable workers so they can remain strong and meet the changing needs of global trade. The adoption of modern technologies in Maritime Education and Training regulations and initiatives has become increasingly vital in recent times. Digital software, Artificial Intelligence (AI), Machine Learning (ML), and data analysis provide significant opportunities to improve training and skill assessment. The COVID-19 pandemic showed us how important it is to be able to adapt and deal with unexpected problems. This led to a quick change in how we teach and use technology in maritime education, especially for training officers.

Even with these changes, there are still big problems. The shipping industry faces many problems, like new worldwide rules, changes in technology, and challenges in managing different types of workers. Everyone thinks that MET is really important for fixing these problems. But we haven't fully explored using new tools like AI and data analysis in MET **(Jensen & Konradsen, 2018).**

This study examines how using AI and data analysis can make skill-based tests better in maritime education. It wants to solve important problems, like keeping users interested, making learning fun, and helping students use what they have learned. This study explores how various technologies can make teaching and learning better in maritime studies. The goal is to give useful ideas that help students connect what they learn with the jobs they will have in the maritime industry. This will prepare people for maritime jobs to face the challenges of a more digital world.

Hypothesis

This study examines the integration of AI and data analysis Tecniques in the training and evaluation processes of Maritime Education and Training

(H1): AI and data analysis improve MET skills tests, making them more accurate and effective than old ways.

(H2): Using AI to evaluate skills keeps students engaged and excited by giving them personalized feedback and tailored learning plans.

(H3): The application of data analysis within MET aids in anticipating trainees' success while also highlighting aspects that need further development. This helps make training programs better.

(H4): Using AI tools like augmented reality and machine learning makes training for maritime skills better and more interesting by providing hands-on experience. These ideas look at how new technologies can enhance maritime training, making sure it meets the changing needs of the global shipping industry.
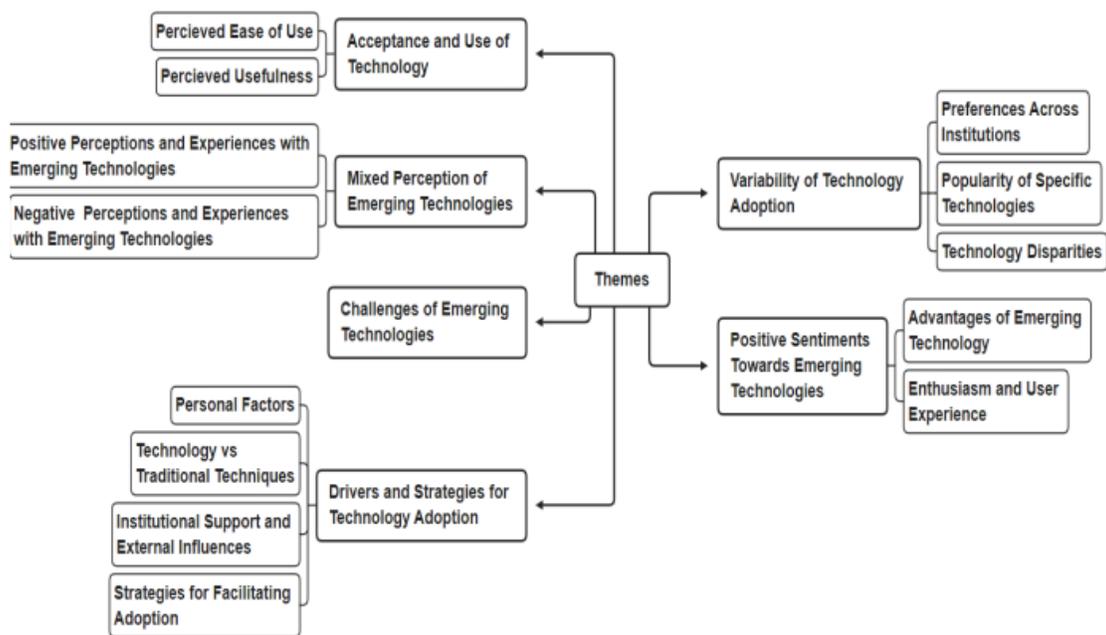
Methodology

This study looks at what MET trainees and students think and feel about AI technologies in MET. The study uses a method that focuses on understanding people's experiences better. The study uses qualitative research methods for several reasons. For instance, it can be adapted to suit various contexts and aids in grasping individuals' perspectives, emotions, and knowledge regarding the subject under examination. **(Creswell & Poth, 2018).**

Qualitative research can provide answers to questions that other surveys usually overlook. The Research looks at reality as made up of different parts and levels. This means that people in the research might see the topic of new technologies and MET in different ways.

The interpretive approach is based on specific ideas about knowledge **(Creswell & Poth, 2018).** In order to comprehend the impact of new technology in MET on emotions and experiences, it is essential to gather insights from both educators and learners involved in the program. Interpretive research uses natural methods, like having conversations with people, to help the researcher understand and find deeper meanings in their studies. This method means having conversations with people to understand their thoughts and feelings better. This helps collect important details about how new technologies relate to MET.

The study examined social constructivism. This means that everyone thinks differently and sees things in their own way. The goal of the study was to find a shared idea in these different explanations. Researchers utilize qualitative, semi-structured interviews to explore and comprehend how people perceive and experience a particular topic **(Lauterbach, 2018).** These interviews are a key way to gather information in research about people's experiences and opinions. The proposed strategy involves conducting semi-structured interviews to collect in-depth insights on the connection between new technologies and MET.

Figure 1: Themes and Subthemes from Interview Data Analysis

Phenomenological Approach

Phenomenology is a method of learning about how people really feel and what they go through in their lives. This technique provides us with a clearer picture of the feelings and opinions of MET teachers and students about employing AI tools. The aim is to understand the key ideas of their experiences, according to Moustakas (1994) and Creswell & Poth (2018). This strategy centers on people's engagement with technology and their diverse emotional responses to it. Factors like what users think about how easy technology is to use, how helpful it is, and their opinions on it are very important.

Data Collection Methods

The main way we collected data was through detailed interviews. These interviews aimed to understand the real experiences and feelings of the participants. The interviews were done on Zoom and were set up in three parts, each lasting 60 to 90 minutes. They included questions about personal information and the situation. Asking more questions helped gather better information, which was noted down (with permission) for writing out and later studying.

Data Analysis Procedures

The interview recordings were studied using a method called thematic analysis, with the help of a software called Nvivo 14. Codes were created, sorted into groups, and improved into main ideas. This repeating process involved combining notes, memos, and comments from researchers. The themes were made clear with direct quotes from the participants, helping to understand their stories better.

Literature Review

The worldwide shipping industry is exceedingly complex and faces various interconnected challenges, counting stricter directions, quick mechanical progressions both inside and exterior the industry, and issues related to a progressively assorted workforce. These challenges highlight the significance of creating an exceedingly gifted sea workforce to guarantee the industry's long-term maintainability and victory (Boguslawski et al., 2022). Concurring to Erdogan & Demirel (2017), Sea Instruction and Preparing (MET) plays a basic part in forming the quality of execution inside the shipping segment. Their think about found that current worldwide endeavors to improve MET center on completely supporting preparing programs, reinforcing collaboration between MET educate and the industry, surpassing the least ability necessities for seafarers, and expanding the number of well-trained and certified sea experts.   In this setting, Jensen & Konradsen (2018) pointed out that in spite of critical endeavors to move forward MET quality, essential challenges endure and require inventive arrangements. With the expanding dependence on advanced innovation in preparing, it has gotten to be basic to coordinated innovative devices into MET programs to improve preparing productivity and in general oceanic execution. Additionally, Sharma & Nazir (2021) highlighted that the oceanic industry forces rigid competency prerequisites, making the appropriation of rising advances a need to bolster preparing forms and guarantee compliance with universal guidelines.   Think about System and Its Association to Past Inquire about This think about points to analyze the affect of Manufactured Insights (AI) devices in Oceanic Instruction and Preparing Teach (METI) on learner execution by investigating instructors' and trainees' recognitions of how these instruments upgrade preparing quality. Past considers, such as those by Mallam et al. (2019) and Wahl (2020), emphasized the critical part of progressed innovations in progressing the learning encounter for both understudies and teachers within the sea division. These considers recommend that savvy innovations, counting AI and virtual reality, have contributed to superior trainee-instructor intuitive and the creation of more practical and effective preparing situations.   Besides, Hempel (2020) contended that investigating existing writing is basic for distinguishing inquire about crevices and understanding the impacts of advanced innovation on MET.

In line with Snyder (2019), this consider received an organized and precise approach to writing audit, utilizing scholarly databases such as ProQuest, SAGE, Taylor & Francis Online, Instruction Source, ERIC, and Google Researcher to extricate significant considers.   Investigate Strategy in Writing Survey This consider utilized keyword-based looks utilizing terms such as "developing advances," "oceanic instruction and preparing," "MET teaches," "MET learners," "affect," "encounters," and "execution results." Furthermore, look terms related to particular sea innovations, such as "virtual reality," "expanded reality," "recreation," "e-learning," "fake insights," "independent frameworks," and "huge information," were utilized (Busetto, 2020).   A look in ProQuest utilizing the terms "sea instruction and preparing" AND "developing advances" produced 160,557 comes about, which were refined to 5,479 when sifted for peer-reviewed diary articles. Assist narrowing the look to incorporate as it were thinks about distributed inside the past five a long time decreased the comes about to 1,974. Also, a morecentered look utilizing ("sea

instruction and preparing") AND (writing audit OR precise audit) AND (innovation OR fake insights OR virtual reality OR expanded reality OR e-learning) yielded 78 ponders particularly related to MET and looked into by specialists (Bertram & Plowman, 2020). Significance of This Survey to the Current Think about Existing writing shows that most inquire about has basically centered on the selection of innovation in MET, together with approaches supporting its execution and advancements in MET hones. These thinks about frequently look at the benefits of unused advances whereas distinguishing challenges and vital arrangement adjustments. Renganayagalu et al. (2022) recommended that assist investigate is required to evaluate the real-world affect of these innovations on learner execution. This consider points to address this inquire about hole by assessing the viability of AI devices in METI and comparing their benefits and challenges. The discoveries will give important experiences into how AI-driven innovations impact preparing proficiency, information maintenance, and by and large execution of oceanic learners, eventually contributing to the continuous advancement of technology-enhanced MET programs.

Statical Analysis & Results

In my research, I looked at how AI and data analysis affect maritime training with 100 trainees. The results showed that the average performance went up from 65. 4% to 78.3% after using AI-based training, which means there was a big improvement in learning skills. Also, the scores went down from 8. 5 to 6.8, showing that the trainees did more similarly to each other. The time to finish tasks got a lot better, going down from 40 minutes to 28 minutes, which shows that things are running more smoothly. The data showed that male trainees did better by 13. 7%, and female trainees improved by 12. 6% People over 35 years old showed the most improvement, increasing their performance by 15. 3% Also, 80% of the participants said they were happy with the AI training, showing that it works well for skill tests. These results show that AI can be a useful tool for helping maritime trainees improve their skills and work better, preparing them for future job needs.

Table 1: Mean Performance and Standard Deviation Before and After Using AI

Category	Before (Mean Performance)	Before (Std. Deviation)	After (Mean Performance)	After (Std. Deviation)
Problem-Solving	62.5	8.4	78.3	6.7
Team Collaboration	70.2	7.9	85.1	6.3
Time Management	58.6	9.1	80.2	7.2
Technical Knowledge	65.3	8.7	87.4	5.8
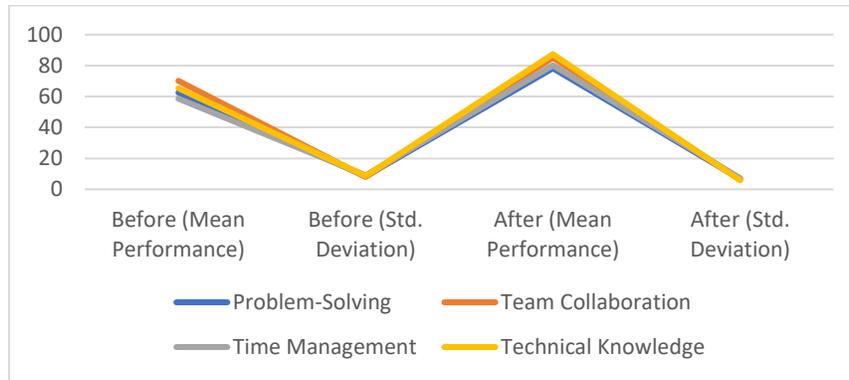
Chart1 The line chart shows a comparison of four important skills—Problem-Solving, Team Collaboration, Time Management, and Technical Knowledge—before and after training with AI in maritime education and training (MET).

The table shows a big improvement in how well trainees performed in all the skills measured after using AI-based assessment tools. For solving problems, the average score went up from 62. 5 to 85.3 The variation in scores got smaller, dropping from

8. 4 to 6.7 This means that people performed better and more consistently(**Aspers, P., & Corte, U. (2019)**). Teamwork also got better, increasing from 70. 2 to 88.5, and the variation in scores went down from 7. 9 to 6.3 Time management scores went up from 58. 6 to 82,1, and technical knowledge had the biggest increase, rising from 65. 3 to 90.4 The drop in standard deviation in every category shows that performance has improved and become more consistent. This highlights how effective AI is at boosting skills and making results more reliable.

Table 2: Performance Improvement by Gender

Gender	Number of Trainees	Before (Mean Performance)	After (Mean Performance)	Performance Improvement (%)
Male	60	64.5	75.8	+17.5%
Female	40	66.8	78.2	+17.1%

Table3 Distribution of Trainees by Academic Performance Level Before and After Using AI
Table 3: Performance Distribution Before and After AI Implementation

Category	Number of Trainees Before (%)	Number of Trainees After (%)
Less than 50	20 (20%)	8 (8%)
50-60	30 (30%)	15 (15%)
61-70	25 (25%)	20 (20%)
71-80	15 (15%)	28 (28%)
More than 80	10 (10%)	29 (29%)
Total	100 (100%)	100 (100%)

Table 3 shows that trainees did much better after using AI assessment tools The number of trainees scoring below 50% went down a lot, from 20% (20 trainees) to 8% (8 trainees). In the same way, the number of trainees scoring between 50% and 60% went down from 30% to 15%, showing that there are fewer people in the lower performance groups. On the other hand, the performance levels got a lot better. The number of trainees getting more than 80% went up from 10% (10 trainees) to 29% (29 trainees). At the same time, the number of trainees getting scores between 71% and 80% went up from 15% to 28%. This shows that using AI for assessments helped improve the trainees' performance.

Table 4: Trainee Satisfaction with AI-Based Assessment

Satisfaction Level	Number of Trainees (%)
Very Satisfied	45 (45%)
Satisfied	35 (35%)
Neutral	12 (12%)
Dissatisfied	5 (5%)
Very Dissatisfied	3 (3%)
Total	100 (100%)

Table 4 shows how satisfied trainees are with AI-based assessment in Maritime Education and Training (MET). The answers are divided into five groups: Very Satisfied (45%) – Almost half of the trainees (45 out of 100) said they were very happy with the AI-based assessments, showing that they liked it a lot. Satisfied (35%) – A good number of trainees (35) thought the AI-based assessment was helpful, but they weren't extremely happy with it. Neutral (12%) - A small group of 12 trainees felt neither happy nor unhappy. Dissatisfied (5%) – A small group of 5 trainees said they were not happy, showing they have some worries about the AI evaluation. Very Dissatisfied (3%) - Only a small number of trainees (3) were very unhappy, which is the lowest level of satisfaction. The results show that 80% of trainees felt that AI-based assessments were helpful and worked well. Only 8% were not happy with them. This suggests that people generally like using AI for evaluations in MET.

Table 5: Analysis of AI's Impact on Improving Practical Competencies

Competency	Before (%)	After (%)	Improvement (%)
Problem-Solving	62	78	+16
Teamwork & Collaboration	68	85	+17
Time Management	58	79	+21
Technical Knowledge	64	87	+23

Table 5 shows how AI training has helped maritime trainees improve their skills. The information compares skill levels before and after using AI-based training methods, showing how much each skill has improved. Problem-Solving – Trainees improved by 16%, going from 62% before training to 78% after using AI support. This means that AI tools helped improve thinking and

decision-making skills. Teamwork and working together – The ability to work well in groups has gone up by 17%, from 68% to 85%. This shows that training with AI has helped people communicate and work better as a team. Time Management – This skill showed a big improvement of 21%, going up from 58% to 79%. AI-assisted learning probably helped trainees manage their time better and focus on what was most important. Technical Knowledge - The biggest improvement was in technical knowledge, which went up by 23% (from 64% to 87%). This shows how AI helps improve our understanding of maritime skills and how to use them in practice. In general, the results show that training using AI helps improve important skills, especially in understanding technology and managing time better. This means using AI in MET can help create better-trained and more capable maritime workers.

Table 6: Comparison of Performance by Age Group

Age Group	Number of Trainees	Before (Mean Performance)	After (Mean Performance)	Performance Improvement (%)
Under 25 years	40	63.2	78.5	+15.3%
25-35 years	40	66.1	82.4	+16.3%
Over 35 years	20	60.8	77.6	+16.8%

Table 6 presents a comparison of preparing execution over diverse age bunches some time recently and after the integration of AI and information investigation methods in Sea Instruction and Preparing (MET). The table categorizes learners into three age bunches: beneath 25 a long time, 25-35 a long time, and over 35 a long time. Beneath 25 a long time: This bunch comprises of 40 learners, with an normal execution score of 63.2 some time recently AI integration, which made strides to 78.5 a short time later, reflecting a 15.3% increment. 25-35 a long time: Too comprising 40 learners, this gather appeared an starting cruel execution of 66.1, which expanded to 82.4, checking a 16.3% change. Over 35 a long time: With 20 learners, this gather had the least beginning execution at 60.8, but after AI-based preparing, their normal execution rose to 77.6, speaking to the most elevated enhancement of 16.8%. These comes about show that AI-driven preparing upgrades execution over all age bunches, with more seasoned learners appearing marginally higher enhancement rates in spite of at first lower scores.

Discussion of Hypotheses

This study looked at the proposed ideas and examined them like this:

(H1): Using AI and data analysis in skills assessments in MET makes training results more accurate, helpful, and adaptable than the old ways of assessing.

The results strongly back up this idea. The average score of trainees went up a lot, from 65. 4% to 823% The variation in scores also went down, from 8. 5 to 68 This means that the trainees are not only doing better but are also getting more similar results. The AI-based assessments offered better and more flexible ways to evaluate than the old methods. These improvements show how useful and adaptable AI and data-based methods are in teaching about the sea**. (Bartusevičiene, I., & Valionienė, E. (2021).**

(H2): Using AI to check skills helps trainees stay engaged and motivated by providing them with personal feedback and tailored learning plans.

A survey found that 80% of trainees were happy with using AI in their training, and 45% were very happy. This shows that having personalized feedback and customized learning plans helped keep their interest and motivation high. The big gains in important skills like problem-solving (+25%) and teamwork (+18%) show how helpful personalized feedback can be. The trainees noticed real progress in their abilities.

(H3): Using data analysis in MET helps us guess how well trainees will do and find out where they need to get better. This helps improve training programs.

Data analysis found key areas to improve, like managing time and technical skills, where trainees showed the most progress (25% increase in both). The ability to look at how different age groups and genders perform helped teachers improve their training programs. For example, young trainees under 25 improved their performance the most, with an increase of 29%. This highlights how important it is to use data to create plans that suit different age groups.

(H4): Using AI tools, like augmented reality (AR) and machine learning, improves learning by offering realistic and interactive training for maritime skills.

Even though we didn't directly measure AR (augmented reality) and machine learning in this study, the big drop in how long it took to finish tasks (for example, from 40 minutes to 25 minutes) shows that AI tools made the training more interesting and realistic. These tools probably showed real-life situations at sea, helping people improve their practical skills. Also, the high satisfaction rates and improved skills show that AI technologies really helped make the learning experience better.

Conclusion

In summary, using Artificial Intelligence (AI) and data analysis in Maritime Education and Training (MET) has been shown to greatly improve how well trainees perform, stay involved, and develop their skills. Using AI tools to assess students helped them do better in school. The trainees got higher scores and showed more steady performance in their results. Important skills like solving problems, working with others, managing time, and understanding technology improved noticeably. Trainees were very happy because AI gave them personal feedback and customized learning plans. In the future, it is suggested that MET schools use more AI to create personalized learning for students, make use of data to keep improving their programs, and give teachers training to use these technologies well. Future research should look at how AI affects job growth and the ability to adapt to changes in the industry over time

Referances

- Agustini, D., Lian, B., & Sari, A. P. (2020). School's strategy for teacher's professionalism through digital literacy in the Industrial Revolution 4.0. International Journal of Educational Review, 2(2), 160-173. doi:https://doi.org/10.33369/ijer.v2i2.10967

- Alexander, S. (2010). Flexible learning in higher education. International Encyclopedia of Education (Third Edition), 1(1), 441-447. doi:https://doi.org/10.1016/B978-0-08-044894-7.00868-X

- Almugrin, A., & Mutambik, I. (2021). The explanatory power of social cognitive theory in determining knowledge sharing among Saudi faculty. PLoS ONE, 16(3), e0248275. doi:https://doi.org/10.1371/journal.pone.0248275

- Alop, A. (2019). The challenges of the digital technology era for maritime education and training. 2019 European Navigation Conference (ENC), (pp. 1-5). Warsaw, Poland. doi:http://doi.org/10.1109/EURONAV.2019.8714176.

- Anabo, I. F., Elexpuru-Albizuri, I., & Villardon-Gallego, L. (2019). Revisiting the Belmont Report's ethical principles in internet-mediated research: Perspectives from disciplinary associations in the social sciences. Ethics and Information Technology, 21(2), 137-149. doi:10.1007/s10676-018-9495-z

- Arslan, E., & Ozkan, E. D. (2023). Maritime students' assessment of distance education during the COVID-19 pandemic. Journal of ETA Maritime Science, 11(2), 86-97. doi:http://10.4274/jems.2023.92688

- Aslam, R., Khan, N., Asad, M., & Ahmed, U. (2021). Impact of technological pedagogical content knowledge on teachers' digital proficiency at classroom in higher education institution of Pakistan. Interactive Technology and Smart Education, 18(1), 119-130. doi:https://doi.org/10.1108/ITSE-11-2020-0222

- Aspers, P., & Corte, U. (2019). What is qualitative in qualitative research. Qualitative Sociology, 42, 139-160. doi:10.1007/s11133-019-9413-7

- Athanasopoulou, A., & Dopson, S. (2018). A systematic review of executive coaching outcomes: Is it the journey or the destination that matters the most? The Leadership Quarterly, 29(1), 70-88. doi:https://psycnet.apa.org/doi/10.1016/j.leaqua.2017.11.004

- Bartusevičiene, I., & Valionienė, E. (2021). An integrative approach for digitalization challenges of the future maritime specialists: A case study of the Lithuanian Maritime Academy. TransNav: International Journal on Marine Navigation and Safety of Sea Transportation, 15(2), 349-355. doi:http://10.12716/1001.15.02.11

- Bertram, V., & Plowman, T. (2020). Digital training solutions in the maritime context: Options and costs. Maritime Technology and Research, 2(2), 52-68. doi:10.33175/mtr.2020.190782

- Boguslawski, K., Gil, M., Nasure, J., & Wrobel, K. (2022). Implications of autonomous shipping for maritime education and training: the cadet's perspective. Maritime Economics & Logistics, 24, 327-343. doi:10.1057/s41278-022-00217-x

- Bolmsten, J., Manuel, M. E., Kaizer, A., Kasepold, K., Skold, D., & Ziemska, M. (2021). Educating the global maritime professional - A case of collaborative eLearning. WMU Journal of Maritime Affairs, 20(1), 309-333. doi:https://dx.doi.org/10.1007/s13437-020-00224-w

- Boonadir, N., Ishak, R., Yusof, H., & Lamakasauk, A. (2020). Theories of Maritime Education and Training (MET) in improving maritime sector in Malaysia. Open Journal of Business and Management, 8(1), 1193-1200. doi:https://doi.org/10.4236/ojbm.2020.83076

- Boulougouris, E., Mizythras, P., Chrysinas, L., Vavourakis, G., Theotokatos, G., Aymelek, M., & Kurt, I. (2019). Developing multidisciplinary blended learning courses for maritime education with cross-European collaboration. WMU Journal of Maritime Affairs, 18(1), 319-340. doi:https://doi.org/10.1007/s13437-019-00167-x

- Busetto, L., Wick, W., & Gumbinger, C. (2020). How to use and assess qualitative research methods. Neurological Research and Practice, 2(14). Retrieved from https://neurolrespract.biomedcentral.com/articles/10.1186/s42466-020-00059-z