Original article

AUGMENTATION OF MARITIME INTERACTIVE TEACHING MODEL TOWARDS SUSTAINABLE DEVELOPMENT GOAL AND INDUSTRIAL REVOLUTION 4.0☆

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Abstract

The manner in which education will be delivered in the 21st-century has often been debated. Various literature has agreed that an interactive teaching and learning method is required in parallel with the emergence and development of cyber technology. The conventional method of teaching should be reconstituted to emphasize aspects associated with innovation and creativity in attracting the attention of students in learning. Despite the current Malaysian education emphasize the learning features that include 1) Creative thinking, 2) Critical thinking, 3) Collaboration, 4) Character and 5) Communication. However, 21st-century approach requires exposure, skills, and creativity to be implemented by the Malaysian educators. Therefore, the aim of this study is to propose a new maritime interactive teaching model towards a Sustainable Development Goals (SGDs) and industrial revolution 4.0. Three (3) secondary schools around Terengganu in Malaysia were chosen to participate in a pilot case study. The results of the study found that more than 90% of students now understand more about the maritime industry based on their acquired knowledge and education in this area. While, more than 70% of students described that this method of teaching is appealing. Maritime education innovative learning through an interactive learning model was successfully achieved based on the findings of this study, called the 'Mariner's Fantasy'. Additionally, through the inspirations of IR 4.0 and the Malaysia Education Development Plan, 2013-2025, the study has demonstrated the usefulness of the Maritime Education Innovative Learning (MEIL) program through an interactive learning method, in enhancing the delivery of maritime education by adopting an effective teaching-based approach.

Keywords: Maritime Education; Sustainable Development Goal; SDG Chapter 4; Industrial Revolution 4.0; Interactive Teaching Model; Knowledge Transfer; Community Based Project.

1. Introduction

The rapid changes in information and advancements in digital technology have had a dramatic, if not, significant impact on the educational sector globally. Education has become much more challenging as well as a huge turning point for every educator in teaching and learning activities by producing multidisciplinary experts in many fields, such as the maritime field. The maritime industry has evolved from traditionally providing less skilled (labor-intensive) resources to an industry now having the knowledge and skilled resources (Grammenos, 2002; Heaver, 2002; Levinson, 2006; Stopford, 2009; Lau and Ng, 2015). As a consequence, this has transformed the nature of maritime education from an extremely impractical (theoretical based only) approach to an educational system emphasizing business skills and analysis (Lau and Ng, 2015).

Based on modern teaching methods, interactive methods include knowledge-based learning, concepts, experiences, opinions, principles and the exchange of views and ideas including attitudes towards achieving the same objectives in a group (Cerghit, 2006). The application of interactive methods and techniques used in the classroom environment has helped to stimulate the development of students' imaginations and creativity (Aaker-Smith, 2006; Oprea, 2009; Petruta, 2010; 2013). Moreover, interactive teaching methods applied in the higher education system have been found to improve the effectiveness of the learning system and productivity (Yakovleva and Yakovlev, 2014).

Grant and Chen (2005) mentioned that system productivity can be measured in terms of "knowledge", "capability", "skills" and "experience" with its integrative nature, determined by personal characteristics, such as adopting a practice-oriented focus, the ability to work in multiple contexts, self-control and self-esteem. Traditional teaching methods at schools and universities involving lectures, explanations, training, etc., are of course important to professional development. However, student boundaries are more evident nowadays being challenged with more complex conditions (Yakovleva and Yakovlev, 2014). Therefore, there is a need to introduce a more systematic and interactive system to improve our educational system that focuses on marine science and aquatic resources.

At present, conventional teaching methods are based on "time and lecturing" or "based on presentation slides". Most lecturers and teachers tend to concentrate on the following elements during classes, such as:

1. Teacher-centred learning;

2. Direct instruction;

3. Theoretical-based Knowledge;

4. Learning the content of basic skills and curriculum theory;

5. Individual learning;

6. Classroom centered;

7. Summative assessment; and

8. Learning for examinations and completing school or university.

Consequently, less focus is placed on developing the required skill elements and applying 21st-century learning features. To this end, the Malaysia Education Development Plan, 2013-2025 was been proposed by the Ministry of Education, Malaysia in which reveals that the education nowadays should be more focused on providing skills to students in meeting the challenges afforded by science and technology in the future by considering five (5) values as illustrated in Figure 1, namely 1) Creative-thinking, 2) Critical-thinking, 3) Collaboration, 4) Character and 5) Communication. The main aim that this paper has been produced is to highlight and share the importance of interactive learning in maritime education. It should be embedded in current teaching delivery of maritime education in the Malaysian context since Malaysia aims to be Asia's leading maritime country in the Asian context of maritime industry.

In cognizance with the inspirations of both IR 4.0 and the Malaysia Education Development Plan, 2013-2025, the purposes of this study are to:

1. Introduce Maritime Education Innovative learning through an interactive learning method.

2. Enhance the delivery of maritime education through an effective teaching-based approach.

3. Encourage students to be more creative, by thinking critically in communicating and managing the collaboration process among their peers through

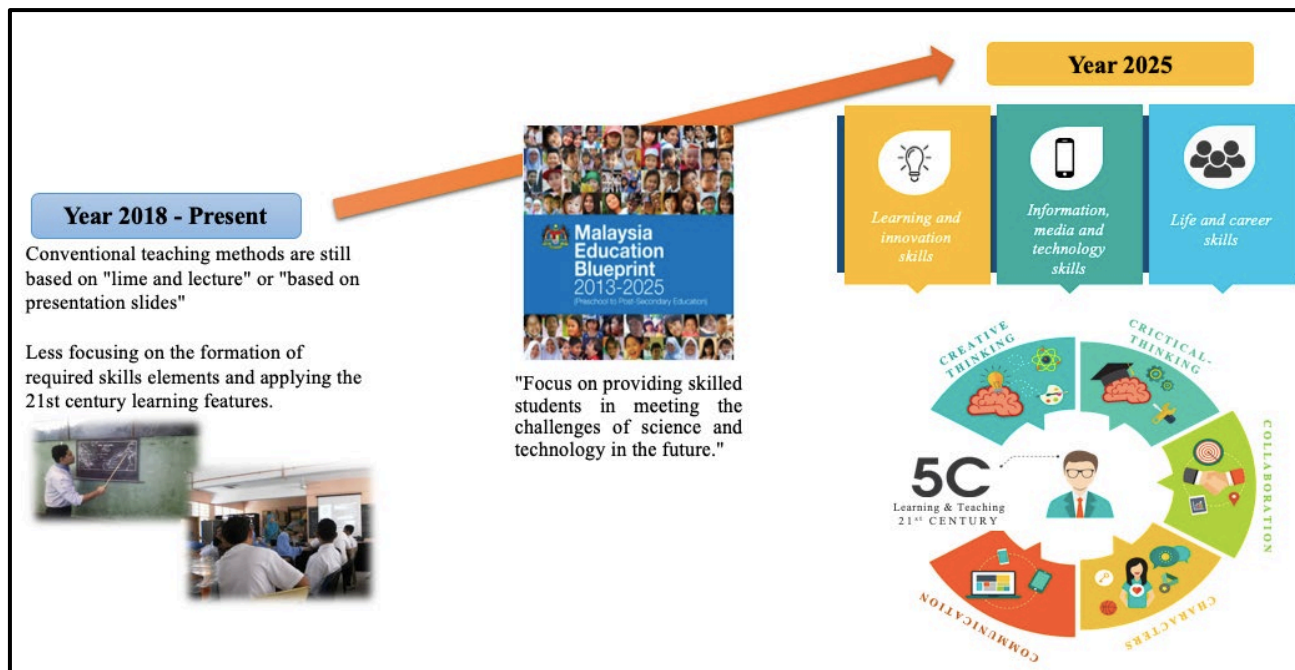adopting the new interactive teaching and learning method.

Figure 1: 21st-century learning features
Source: Buletin Anjakan (2015), Ministry of Education Malaysia (2013)

2. Overview on maritime education

Education is acknowledged as being a significant contributor to the development of social and economic capital. It inspires creativity, fosters innovation, provides youth with the necessary skills to be able to compete and survive in the modern labour market, and is a key driver towards economic growth (MOE, 2013). Education is also key in enabling many of Malaysia's Sustainable Development Goals (SDGs) and targets to be achieved by 2030. Such as to substantially increase the number of youth and adults with relevant skills, including technical and vocational skills for employment, decent jobs and entrepreneurship (UNESCO, 2017). To achieve these targets, Malaysia has aligned the SDGs principles with the 11th Malaysia Plan, which will embed SDGs in all facets of Malaysia's development (UN SDG, 2018). The former Prime Minister of Malaysia, Dato' Seri Mohd. Najib Tun Abdul Razak made his commitment during the UN General Assembly in 2015 that Malaysia will adopt the 2030 Agenda for sustainable development and its implementation (NST, 2018).

Fourth industrial revolution is a strategic initiative recently introduced by the German government to transform industrial manufacturing through digitalisation and exploitation of the potential of new technologies (Rojko, 2017). Future workers will not only need to be

highly trained in emerging technologies but also, in the values associated with using technology. In the future, individuals must not only possess the ability to develop technology but also know whether, when, and where to use the technology. In other words, having the ability to think reflectively and interdisciplinary, (i.e. creativity, critical thinking, negotiation etc.) (Gray, 2016; OECD, 2018).

Regarding the maritime domain, the role that maritime education plays in serving and developing the community constitutes a large part of the strategic pivots of maritime education. Observing the strategic vision of maritime education in many countries, it is shown that maritime education institutions are cultural and educative foundations whose function is to tutor and qualify as well as to guide and educate (Mohye, 2014). The on-going development of the shipping industry requires continual advancement of maritime education. The development of maritime education should keep pace in parallel with the development of the shipping industry which includes both development in technology and the science of maritime management. Hence, in line with the rapid changing in technology development which effecting the basic paradigm operation in maritime industry had grasp number of scholars geared towards the innovation in Maritime Education and Training (MET) (Kitada et al.; 2019; Hjelmervik et al., 2018;

Baldauf et al., 2018; Freitas et al., 2018; Baldauf et al., 2016; Sampson, 2013) as summarised in Table 1.

Table 1: Summary of previous studies on Maritime Education and Training (MET)

Maritime Education and Training (MET)	Citation
The impact study of digitalization era on maritime industry effecting the ship operation as well as leadership required in future coordination.	Kitada et al., (2019)
Experimental study on the design of training simulator by maritime domain to perform docking operation when ocean current increasing complexity.	Hjelmervik et al., (2018)
Simulation study on the traffic scenarios including conventional manned and future unmanned ships.	Baldauf et al., (2018)
The potential of serious game, a new paradigm of game-based learning highlighting the concept shift in education and training.	Freitas et al., (2018)
Introducing the concept of safety and security training simulator, implementation of learning objective-oriented development and pedagogic value added of the simulation.	Baldauf et al., (2016)
Describes the situation of seafarers from Cape Verde and Ghana searching for work in northern Germany and considers the perspectives of women married to Indian seafarers resident in Goa and Mumbai.	Sampson, (2013)

Under the tutelage of educational maritime institutions of developed maritime nations in the 21st century, the new mission of education will be to endorse or accredit educated personnel who are of a high quality far beyond the minimum requirements set by the IMO. Moreover, to encourage them to have acquired an international perspective enabling them to contribute in all aspects of maritime transport management (Manuel, 2017). The accelerating development of the shipping industry necessitates the evolvement of maritime education, confronting and challenging it with many new requirements, such as the requirements of further fostering seafarers' practical skills and proficiency (Mazhari, 2018).

As the Malaysian shipping industry was in decline due to the weakening global shipping market this, in turn, causes the continuation of the nation's balance of payment deficit. Figure 2 illustrates the import, export and transhipment total cargo throughput at Malaysia ports from year 2008 until 2017. The trend from year 2009 described the industry began booming dramatically until reached its peak in year 2015. Then, we can see substantial drop in year 2016 and 2017.
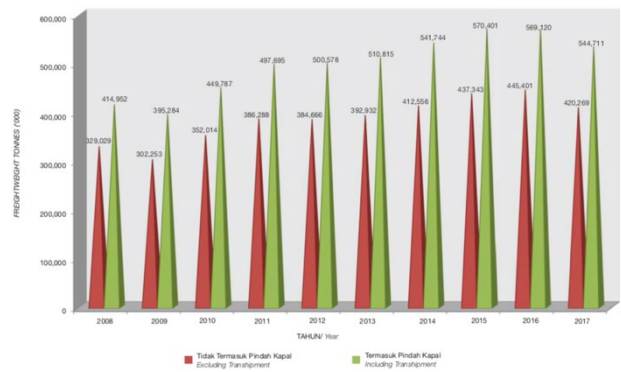

Figure 2: Total Cargo Throughput at Ports, Malaysia, 2008-2017
Source: Ministry of Transport Malaysia (2018)

In addition, the Chairman of Malaysian Shipowners Association (MASA) also highlighted that the Malaysia's shipping industry is now declining after reached its' peak in the 1980s. On top of that, Malaysia are left far behind from its neighbouring country especially Singapore and even had been overtaken by Indonesia (Bernama, 2019). In 2015, a Malaysia shipping master plan was introduced to address the vulnerabilities and needs of the industry in order to improve and revitalise the state of Malaysian shipping in creating a stronger economy. Collaborated by the Ministry of Transport Malaysia, the Marine Department of Malaysia, the Malaysia Shipowners' Association, the Maritime Institute of Malaysia (MIMA) and other vested parties, the plan includes a strategy to put in place the conditions necessary to enable the Malaysian shipping industry to become more resilient and competitive in the national, regional, and global context, and continue to contribute positively to economic development (MIMA, 2015).

The Malaysia Shipping Master Plan comprises of five focus areas each having its own target along with a five-year implementation plan (2017 – 2022). The plan includes promoting the employment of Malaysian ships, promoting employment of Malaysian seafarers and

maritime human resources and focusing on the needs of a Maritime Education and Training Blueprint for Malaysia (MOT, 2017). It is anticipated that the master plan will be achieved through optimising resources and strengthening maritime education practices (Othman, 2014). For Malaysia, the Malaysian Quality Assurance (MQA) system in higher education is continually developing and evolving from education legislation and directives to become a powerful educational hub. The system is centred around achieving learning goals such as knowledge, practical skills, social skills, responsibilities, values, attitudes, professionalism, communication, leadership, team skills, problem solving and scientific skills, managerial and entrepreneurial skills (Abeer, 2016; MQA, 2018).

Even though teaching styles have been categorised into five distinct groups, the ideal teaching style is not either/or the most appropriate proposition but rather, is a hybrid approach that blends the best of everything that a teacher has to offer (Mattis, 2018). Some of the current teaching methods include interactive classrooms, laptops and tablets, video conferencing, and podcasts. However, classroom activities nowadays still play a vital role in the teaching and learning environment (Gill, 2013). The most effective classroom activity is in the form of game-based teaching and learning which comes from the desire to engage students in more active learning in the classroom. Because teachers and the education system require students to be problem solvers equipped with soft skills that they will need as they become adults, games are an excellent method to encourage a mastery mind-set, rather than merely focussing on student grades. In a game-based learning environment, students work on certain quests or adventures to accomplish a specific goal which is the learning objective, by choosing actions and experimenting as they progress (Chen et al., 2012).

Therefore, in response to these scenarios, this study aims to propose an innovative game-based teaching and learning method for maritime teaching and learning towards developing a competent maritime scholar.

3. Methodology

3.1. Community Based Method
The methodology employed in this program is centred on community-based learning approach. Community-based learning is one of the eruditions and learning strategies that incorporate meaningful community engagement with direction and reflection to enrich the learning experience with greater emphasis on mutual learning and reflection. Moreover, it is an in-depth learning-based approach gained from experience which is supported by counselling, providing context, basic knowledge, and intellectual analysis. This approach offers students the opportunity from practising smart knowledge and ideas based on personal observations and social interactions to course themes and academic arguments that bring about understanding and learning experience to individuals regarding the course content. Through this approach, various methods and teaching programs can be utilised by educators to link the knowledge content of a particular field to its surrounding communities, including institutions, history, literature, cultural heritage, and natural surroundings. Community-based learning is also driven by the belief that all communities have intrinsic educational assets and resources that educators can employ to enhance the learning experience of participants (Arthur, 2017).

Adopting this approach, the activities designed in the delivery and implementation of the program are in the form of a simulation game that offers the highest potential as a teaching game given it encourages participants to practice real-world concepts and applications. Similar to the real world, participants interact with the game repeatedly and adjusting each action taken with the simulation to achieve the desired goal.

The main element in this program is to apply the maritime science content in real-world settings through game simulations and to mirror the real situation adopting the teaching and learning process approach.

3.2. Data Sample and Fieldwork

Three secondary schools in Terengganu, Malaysia were identified and selected as a representative sample of the population which included students from (i) SMK Ibrahim Fikri, Kuala Terengganu (SMK SIF), (ii) SMK Komplek Mengabang Telipot, Kuala Terengganu (SMK KOMETS) and (iii) SMK Manir, Kuala Terengganu (SMK MANIR). A total of 60 form six (6) students were selected to participate in this program.

3.3. Case Study – Field Work

The program simulation exercise was conducted on 11th, 23th and 24th October 2019 at SMK SIF, SMK KOMETS and SMK MANIR respectively. The program activities were divided into four (4) sessions incorporating a question session, maritime talk, game session and an interview session with the selected students and teachers as next discussed.
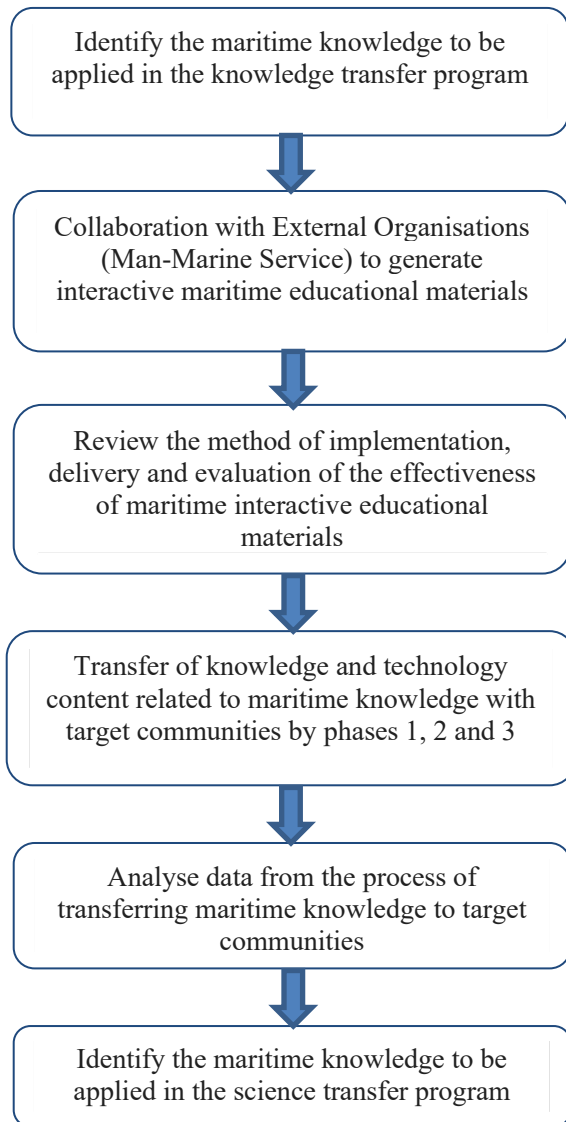
Identify the maritime knowledge to be applied in the knowledge transfer program

Collaboration with External Organisations (Man-Marine Service) to generate interactive maritime educational materials

Review the method of implementation, delivery and evaluation of the effectiveness of maritime interactive educational materials

Transfer of knowledge and technology content related to maritime knowledge with target communities by phases 1, 2 and 3

Analyse data from the process of transferring maritime knowledge to target communities

Identify the maritime knowledge to be applied in the science transfer program

Figure 3: Research framework

3.3.1. Question Session

This study is adapting survey question which divided into two categories, such that the first type is the Pre-test survey question with the participants. A set of Pre-test questionnaires consist two parts including respondent's demography and closed-ended questions on the awareness and understanding of the maritime field. The Pre-test survey question was conducted at the beginning of the program. As such, the questionnaire session was to investigate the level of student awareness and understanding of the maritime field before the maritime interactive teaching began.

3.3.2. Maritime Talk

The purpose of the maritime talk was to provide students with information about the maritime field that was relevant to the program. The session included discussion about venturing into maritime fields and the benefits that could be gained. Also, knowledge transferred by Assoc. Prof. Log. Ts. Dr. Noorul Shaiful Fitri Abdul Rahman, Capt. Dr. Noor Apandi Osnin, Dr. Rudiah Md Hanafiah, Mr. Mohd Rahimi Abdul Halim and Mr. Shahriman Abdul Hamid on types of ships and cargo, the change and trends in maritime industries, demand towards maritime industry, career opportunity and economic impact from maritime industry.

3.3.3. Maritime Interactive Educational Game Session

Before the maritime interactive learning model game session began, the facilitators briefed the participants about the game. The participants were first divided into groups before that game started with each group given a set of the game in order to experience and familiarise themselves on the maritime interactive learning model. The facilitators also assisted by explaining to the participants the terms and rules of the game.

3.3.4. A session with the Students and Teachers

An overall winner was chosen among each group. The winners were then rewarded for their efforts and commitment to winning games that would help to indirectly provide them with maritime knowledge. Upon completion of the award activities, interview sessions were conducted with participants and teachers. Some participants and teachers were selected for interviews in order to receive their feedback on the implementation of the maritime interactive learning model. As such, the Post-test survey questions were conducted. In addition, the question session intended to test the suitability of the maritime interactive learning model from several perspectives such as visibility, interactive and colour levels, information clarity, suitability for exposure, quality, time, age, excitement, ideas and interest in the maritime field. The feedback received from participants and teachers was extremely important in order to improve the maritime interactive learning model. Thus, the questionnaire sessions were conducted with the

participants both before and following the program simulation exercise in order to gauge their knowledge and interest in the maritime field.

4. Mariner's Fantasy – Interactive Learning Model

The purpose of this study as mentioned earlier is to introduce Maritime Education Innovative learning through an interactive learning method and also to enhance the delivery of maritime education through an effective teaching-based approach.

Besides, the component of Student Centered Learning (CSL), it is also important in order for student to achieve better understanding and the most effective way to learn beside the traditional method – 'chalk and talk'. In CSL, student is allowed to create their own way to learn by the guidance that been given to them. In this way, knowledge, skills and disposition to succeed are larger than before.

4.1. Origin of the game:

Before the emergence of computer and online internet games, Monopoly-style games for well over 100 years, have been extremely popular amongst all age groups. The adoption of a monopoly game into the Mariner's Fantasy world offers significant financial wisdom and lessons that can be applied in the real world (Figure 4).

Figure 4: Mariner's Fantasy Game

4.2. How to play:

1. Between two to eight players is required to play on the Mariner's Fantasy game board using a pair of dice and play money (Ringgit Malaysia) provided. A banker is appointed to preside over the game and control the monies and assets.

2. Each player shall throw both dice to move around the board. The player with the highest score will be awarded the first move, followed by the other players in descending order.

3. The game moves in a sequential direction from Alpha to Zulu.

4. For the first round, each player is given a *free for all* tour and given RM200 once they complete the tour. Once achieved, each player can then strategies on how to win the game through trading as they move around the board.

5. Buying Property: Each player can buy any un-owned property from the bank.

6. Upgrading Property: For example, players can buy a warehouse in exchange with four prime movers instead of paying cash.

7. Trading Property: Players can mortgage or sell their property to the bank at half price or trade with other players as a private transaction for any negotiated amount.

8. Paying Rent: When a player lands on another player's property, the owner collects rent from the player with a reference amount printed behind the property's deed card.

9. The player having the most assets and monetary value at the end of the game is the winner.

4.3. Applicability and Contribution of Mariner's Fantasy

By employing the Mariner's Fantasy, a maritime interactive learning model, various groups can benefit. The primary target group are secondary school students who are considering their future career paths. The game is intended to build their awareness of the maritime industry as a future career option. In line with the features of the 21st-century as mentioned earlier, the Mariner's Fantasy game is one of the initiatives that will meet present education requirements. As student-centred learning is applied during the game session, it helps students to build their skills in communication. Indirectly, this maritime interactive learning model will also help to encourage them to pursue their studies in the maritime field build a career and ultimately become a maritime field entrepreneur.

The maritime industry which includes port operations, transportation and logistics, marine support services and other associated maritime fields are most appreciated and greatly more beneficial with improved awareness among students who choose to build their career in this field. Hence, the role of the maritime industry to empower the development of human resources given the increasing supply of graduates from maritime fields those are required in the future.

The secondary target group consists of professional educators with various academic backgrounds and expertise in Universities, Colleges and Polytechnics to improve, disseminate and share their knowledge and skills regarding the maritime field. Through the transfer of knowledge utilising this proposed program, the audience is introduced to maritime knowledge, industry-based knowledge, and a range of skills in communication, problem-solving and critical thinking, strategic management, financial management, entrepreneurship and business skills.

5. Findings

5.1. Comparison between Pre- and Post-Tests

The Pre and Post-test survey questions indicate the homogeneous questions in Section A and Section B to assess the comparison among the participants before and after the maritime teaching learning programme conducted. By using closed-ended questions, this section aims to analyse the impacts of the program on awareness and knowledge of the maritime industry among the participants.

Figure 5 shows the students' familiarisation of "maritime" generally. Then, the awareness of the maritime industry was analysed as among the students in SMK SIF scored the highest compared to SMK KOMETS and SMK MANIR. Students in SMK SIF scored the highest with 95.5% awareness on the maritime industry, followed by SMK MANIR (90%) and SMK KOMETS scored the least with 82.4%. Consequently, following the transfer knowledge program, it showed a clear upward trend to the topmost score (100%) among the schools regarding maritime industry awareness.
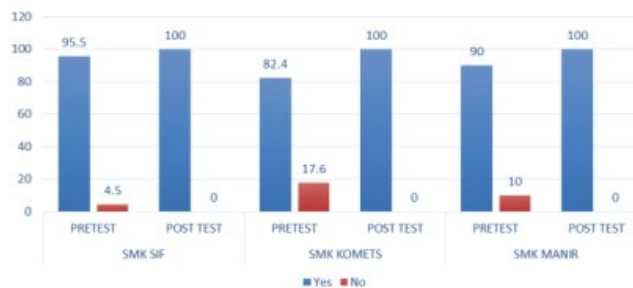

Figure 5: Maritime Industry Awareness

In the meantime, Figure 6 shows maritime port knowledge awareness which addressed as "Do you know about any maritime port in Malaysia?". Students in SMK MANIR scored higher awareness at 95%, compared to SMK SIF and SMK KOMETS on maritime port knowledge. This was followed by SMK SIF (85.4%) and the least score by SMK KOMETS with 70.6%. Following the transfer knowledge program, 100% of students from SMK KOMETS and SMK MANIR had a much greater level of awareness of maritime port knowledge whereas, 4.5% of students from SMK SIF did not achieve a high level of awareness in terms of maritime port knowledge, down from 13.6% during the pre-test which can still be considered as a positive outcome.
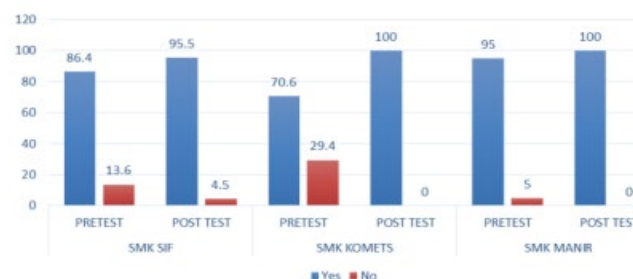

Figure 6: Maritime Port Knowledge Awareness

A multiple-choice question is composed on the understanding of maritime industry sectors by a set of alternatives or possible answers which are 'transportation', 'logistics', 'oceanography' and 'don't know'. By indicating the alternatives or possible answers set, Figure 7 displays the students' understanding of maritime industry sectors. The graph suggests that most of the students from SMK SIF, SMK KOMETS and SMK MANIR only knew about the areas of transportation and oceanography while failing to recognise the logistics field. Consequently, students are more familiar with the transportation and logistics sectors following the delivery of information about the

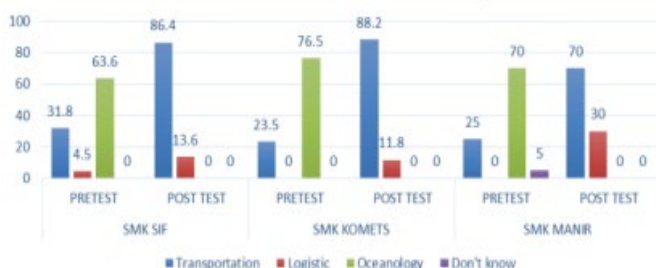maritime industry during the knowledge transfer program.

Figure 7: Knowledge of Maritime Industry Sector

Before the knowledge transfer program, the students from all three schools had an average low level of interest in building profession in maritime; 31.8% from SMK SIF, 23.5% from SMK KOME field TS and 30% from SMK MANIR as shown in Figure 8.

While after the knowledge transfer program, the tendency of students' interest towards employment in the maritime industry increased dramatically scoring 68.2% from SMK SIF, 70.6% from SMK KOMETS, 90% from SMK MANIR.
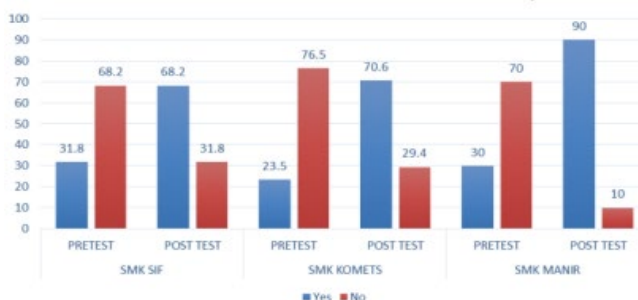

Figure 8: Profession interest in maritime industry

In summary, the comparison between the pre-test and post-test showed a positive impact in using the knowledge transfer program conducted in SMK SIF, SMK KOMETS and SMK MANIR. As the results showed, more than 90% of students now understand more about the maritime industry, regarding their level of knowledge and education as well as the various sectors in the maritime industry. Hence, this program increased their level of interest to build a professional career in the maritime industry.

5.2. Post-test Section C (relates with Mariners' Fantasy)

This section briefly discusses the Post-test survey question in Section C which indicates the level of agreement from strongly disagree, disagree, neutral, agree and strongly agree by using the Likert scale data. The aim of this section is to assess the suitability of the maritime interactive learning model from several perspectives such as attractiveness, visual and colour, suitability for maritime exposure as well as the interest to suggest to others.

Figure 9 shows that students found the Mariners Fantasy an attractive maritime interactive learning model with the percentage of students strongly agreeing toward the attractiveness of the maritime industry as scored by SMK KOMETS (94.1%), SMK SIF (81.8) and SMK MANIR (60%).
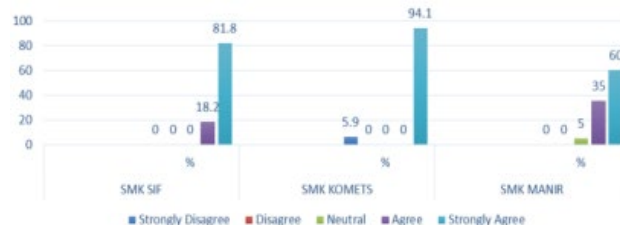

Figure 9: Attractiveness

In terms of its visual appearance and colour, students from SMK SIF, SMK KOMETS and SMK MANIR was strongly agree with the maritime interactive educational material as presented in terms of visuality and colour, especially SMK KOMETS, which scored the highest at 88.2%, SMK SIF (68.2%) and the least scored by SMK MANIR with 55% (Figure 10).

Figure 10: Visual and colour

In addition, Figure 11 shows the students' opinion regarding the suitability of the maritime interactive learning model in gaining exposure to the maritime industry. Among the schools that scored, the highest is SMK SIF (72.7%), followed by SMK KOMETS (64.7%) whereas, SMK MANIR scored 35% strongly agree.
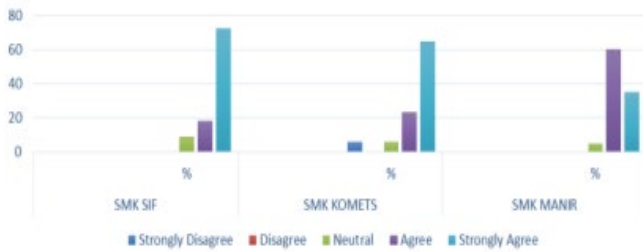
Figure 11: Suitability for maritime exposure

Meanwhile, Figure 12 displays the level of intent for the maritime interactive learning model to be recommended to other individuals or groups. SMK KOMETS scored the highest interest in suggesting the learning model to others with a score of 94.1%, followed by SMK SIF (86.4%) and SMK MANIR (75%).
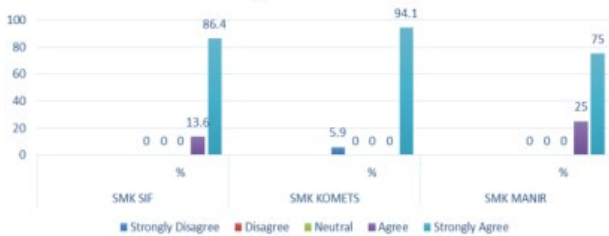

Figure 12: Suggestion to others

Overall, the maritime interactive learning model named 'Mariner's Fantasy' was well accepted by the respondents in this exercise based on ten (10) criteria used to measure the level of acceptance. More than 70% of students strongly agreed with the model's attractiveness, visuals and colour, suitability for maritime exposure and suggestion to others. In conjunction with the transfer knowledge program, this model was also found to contribute indirectly to students' career intentions in the maritime industry. The sustainable development and transformation of quality education proposed in this study are anticipated to become a new teaching and learning method for maritime students with many benefits based on:

1. Student-centred learning;
2. Collaborative-skill learning;
3. Encourages high-level thinking process skills;
4. Use of practical skills (hands-on);
5. Empowering group and community life skills;
6. Formative assessment;

7. Improve communication skills and confidence level; and
8. Life-based learning.

Ultimately, the outcomes and contributions of this study include:

1. Improving the level of understanding of target students and participants in the exploration of maritime knowledge.
2. Developing maritime knowledge access to target groups resulting in raising interest in maritime careers in future.
3. Building entrepreneurial skills among target groups.
4. Commercialising and promoting the product in the market by collaborating with industry.
5. Commercialising and promoting the product to target markets amongst Universities/ Colleges/ Polytechnics, Maritime Institutions and Secondary Schools.
6. The Mariner's Fantasy can be employed as one of the methods of delegation among Universities/Colleges/Polytechnics given a similar environment in implementing and conducting the transfer knowledge program.

6. Conclusion

The most significant factor is the lack of interest in the learning process. The objective of the innovation as presented in this study was to develop a new method that could be utilised as a new learning method and to explore this new learning technique through the project undertaken involving 60 form six students in Malaysia.

The empirical results of this pilot project have demonstrated the program to be more interactive as an educational learning method. Therefore, an interactive learning method is highly recommended to replace or complement the traditional learning method. Moreover, maritime education needs to be considered in light of improving knowledge about the maritime industry. By adopting this new learning method, basic knowledge will be deeply embedded in the minds of students while learning. Society will also know learn and be more aware of the maritime industry through the knowledge gained. Likewise, regarding the economic benefits and

opportunities of this program, it will be promoted to the public and indirectly inviting interested people to join the maritime industry. Lastly, it is anticipated that the findings and contribution of this study will attract a greater number of students and communities to explore and learn about the maritime industry.

7. Acknowledgement

8. Authors' Declaration

On behalf of all authors, the corresponding author states that there is no conflict of interest.

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