

The Use of Instructional Materials in Physical Education to Enhance the Students' Knowledge and Skills in Swimming and Life-Saving Techniques

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ABSTRACT: John B. Lacson Foundation Maritime University (Arevalo), Inc. is mandated to offer aquatic-sports courses such as paddling, rowing, sailing, and swimming to equip students with needed skills essential for survival in case of emergencies. Since, there is a dearth of instructional materials in Physical Education 2 (Advanced Swimming and Life-saving Techniques), the JBLFMU-Arevalo was given a research grant by the CHED (Commission on Higher Education) known as DARE TO (Discovery Applied Research and Extension Trans/Inter-Disciplinary Opportunities) to address the problem. This DARE TO grant aimed to develop instructional materials in PE 2 that will enhance the swimming performance and life-saving techniques of students. That is why the researchers would like to test for the effectiveness of this instructional material in the form of modules over the traditional approach which is lecture in improving the students' swimming performance and life-saving techniques in terms of their knowledge and skills. This non-equivalent control group under quasi-experimental study was utilized among the BSMT (Bachelor of Science in Marine Transportation) students. A pretest was used to determine swimming performance of the experimental and control groups. An intervention through the use of instructional materials was employed in the experimental group for the whole semester (five months) while the control group was exposed to lecture as a traditional method of instruction. After a semester, the posttest was administered. The statistical tools used were mean, standard deviation, Mann-Whitney test, and Wilcoxon-signed ranks test. The findings of the study revealed that the instructional material is effective in enhancing the swimming performance and life-saving techniques of students both in the aspects of knowledge and skills. Both the experimental and control groups were "Fair" in their knowledge pretest scores but during the posttest, the experimental group was "Good" and the control group was "Fair". On the other hand, both the experimental and control groups were "Fair" in their skills' pretest scores but during their posttest, the control group was "Good" while the experimental group was "Excellent". The experimental group who used the module showed significantly better performance during the posttest both for knowledge and skills compared to the control group who did not use the module (lecture only). The study further showed significant differences in the mean gains between the experimental and control groups after the conduct of pretest and posttest in favor of the experimental group. It can be gleaned from the results that the module can enhance the knowledge and skills in swimming performance and life-saving techniques of the experimental group. It is highly recommended that this module be utilized among maritime schools offering swimming and life-saving courses.

reached an estimated 1,647,500 seafarers consisting of 774,000 officers and 873,500 ratings, of which the greatest contributors are China, Philippines, Indonesia, the Russian Federation, and Ukraine. The Philippines has been hailed as the largest supplier of ratings on the other hand China has the largest supply of officers. Overall, the global demands reach to 1,545,000 where 790,500 officers and 754,500 ratings. As mitigation for the demand, one of the recommended actions was to enhance maritime education and training.

Due to the archipelagic nature of the Philippines, Filipinos have long been using boats or ships as means of transportation providing them with seafaring skills. Due to this, the Philippines provides a huge bulk of seafarers in the maritime industry making it a major global supplier [2]. In addition, according to the BIMCO Report [3], the Philippines is the second-largest supplier of seafarers worldwide. On the contrary, the report from Depasupil [4] stressed that the Philippines remained the number one source of seafarers amounting to 229,000 onboard merchant vessels worldwide. This was because Filipinos were better trained and English proficient compared to other races. In recent surveys, the sway of Filipino and Chinese seafarers has reached a point of slowly changing the demographics of worldwide manpower on the shipping industry.

The shortage of skilled maritime labor has called for skilled talent within the industry [5]. Manalo, Marshall, and Fraser [6] have suggested to improve the academic performance of the students, address the key aspects of learning, and to point out their failures and risks for further failures with regards to their studies. They also presented the critical factors and action plans which include the preparation, organization, implementation of the programs, the consideration of knowledge and experience of the program deliverers, methods used, and relevant teaching materials and mode of delivery. Consideration of these relationships develops the other supporting mechanisms linked to the learning of the students.

Article XIV, Section 19 of the 1987 Constitution of the Republic of the Philippines for Sports states the promotion of physical education and sports programs encouragement [7]. With this, under the CMO 13, 14, 27, 31 and 32 series of 2013, CMO 20 series of 2014, CMO 20 series of 2015, and, CMO 67, 70 and 71 series of 2017 in cooperation with MARINA (Maritime Industry Authority) has mandated HEIs (higher education institutions) engaged in maritime fields to set the minimum mandatory requirement for policies, standards and guidelines for maritime courses [8]. Furthermore, RA 5708 known as the "The Schools Physical Education and Sports Development Act of 1969" that supports the promotion of physical education in schools shall also be a key basis of this study [9].

In addition to the provisions of the constitution by the country, certain international laws and conventions specifically, under the maritime field have mandated the minimum mandatory requirements for the physical capabilities. This includes: lifesaving on Chapter 3, Section V, Regulation 35 of the SOLAS Convention (SOLAS,

2014) [10]; basic training under Table A-VI/1-1, Section A-VI/1, Regulation VI/1, Chapter VI of Standards of Training, Certification, and Watchkeeping Convention [11]; and the provisions of Part A, Part C, and Part D of Proficiency in Personal Survival Techniques of IMO Model Course 1.19 [12]. According to Zhenbin [13], maritime PE reform and development on schools [14] under the standards of the STCW Convention shall result in better service of the maritime industry.

Swimming comes with its fundamentals. This includes the following: breathing [15, 16], floating [17], and gliding [18-20]. On the other hand, the basics of strokes are also essential. These include crawl or freestyle [15, 16, 18, 20-22], breaststroke [15, 16, 20-22] backstroke [15, 16, 18, 20, 22]. On the other hand, sidestroke [17] was included in some stroke types but the more acknowledged type was butterfly stroke [15, 16, 20-22].

The grounds of the study shall be the establishment of the instruction as a basis for the developments of the instructional materials. This study shall also apply to aid the betterment of the training and instruction to provide a basis for the enforcement of the fundamentals of seafaring.

Aside from the necessity of producing quality seafarers, several health benefits can be acquired from swimming. Swimming is beneficial in a great array of aspects. This includes physical [23-27], social [18, 22], emotional [18, 27], mental [18, 22, 28], psychological [24, 25, 29-31], physiological [16, 26, 32], and spiritual [22, 27, 33] aspects. Lindgren and Nilsson [34] have presented the cognitive dimension of knowledge (technical knowledge) has a relative influence on the development of a student.

The first step to survival starts with the correct approach to the water surface. Basics of water entry includes: ease into the water [17], stride jump entry [35-38], and feet first entry [39, 40]. Some other rescue techniques include blockings (open palm and leg blocking) and escapes (head hold, wrist, and arm escapes) [41-46]. Furthermore, survival at the water includes the following skills such as underwater swimming, water treading and sculling [17, 42, 47].

This study shall be applied not only to the basic education of the seafarers but also to increase their rates of survival once cast out into the vast ocean. European Maritime Safety Agency (2016) [48] has presented 3,296 casualties and incidents resulting in 91 very serious casualties. This has generated 976 injured seafarers bringing forth 115 fatalities. Drowning was one of the key players of casualty increase. This study shall give the Filipino seafarers the advantage of aquatic survival and rescue if needed.

The highly rated impact of the seafaring profession [34] has influenced the choice of students in taking their professions. The John B. Lacson Foundation Maritime University (Arevalo), Inc., as a maritime institution and a major global supplier of world-class technical and professional manpower is mandated to offer aquatic-sports courses such as swimming, sailing, paddling, and rowing. These courses are designed to equip BSMT (Bachelor of Science in Marine Transportation) students with the skills

essential for survival, in case of emergencies or during ship abandonment.

This is also in compliance with STCW Chapter 6, Table A-6/1, Column 3 (STCW 78 as Amended). The techniques are not only applicable to maritime courses but also other non-maritime related ventures. The study aimed to provide a basis for the construction of an instructional material for swimming and aquatic life saving techniques. This shall also enhance their survival rates at any emergency situation at sea. In effect, the study shall be beneficial to all those who practice aquatic sports, maritime rescue personnel, PE instructors, the Maritime Industry, Maritime Institutions, the Department of Education, and those who are inclined to any aquatic activities may it be recreational or instructional.

This study is anchored on CHED's (Commission on Higher Education) research agenda on maritime education and social and behavioral sciences. It is also aligned with the University's research agenda on maritime education and creating developmental research. This research is also anchored in the STCW mandates. This study is anchored on Bruner's Cognitive-Development Theory [49] which explains that one's knowledge is achieved through instruction; each element of instruction is evaluated to determine the extent of the students' achievement of stated objectives. Bruner further states that when the entire program is completed, a final evaluation of the success of both the students and the program will be necessary. Furthermore, this study can also be gleaned from the Skill Acquisition Theory which implies that as an individual acquires new skills, his knowledge also increases resulting in remarkable improvement, positive behavioral changes and refinement, spontaneity, fluency, and competence [50].

This study was conceptualized because there is a dearth of instructional materials in Physical Education 2 (Advanced Swimming and Life-saving Techniques). Fortunately, the JBLFMU-Arevalo was given a research grant by the CHED known as DARE TO (Discovery Applied Research and Extension Trans/Inter-Disciplinary Opportunities) to address the problem. This DARE TO grant aimed to develop instructional materials in PE 2 that will enhance the swimming performance and life-saving techniques of students. That is why the researchers would like to test for the effectiveness of this instructional material in the form of modules over the traditional approach which is lecture in improving the students' in swimming performance and life-saving techniques in terms of their knowledge and skills.

Generally, this study was conducted to determine the effectiveness of instructional materials in PE 2 to the knowledge and skills of students in swimming and life-saving techniques.

2 MATERIALS AND METHODS

2.1 Research Design

This study utilized the quasi-experimental, specifically, the Non-Equivalent Control Group design. It is structured like a pretest-posttest

randomized experiment, but it lacks the key feature of random assignment [51].

2.2 Participants

The participants of the study were the BSMT students of John B. Lacson Foundation Maritime University (Arevalo), Inc. They were selected based on their general weighted average last second semester of school year 2017-2018. For skills, the participants were selected based on weight, height, and physical condition. This ensured that participants are in good condition and did not contradict the activity.

These students have undergone PE 1—Introduction to Physical Education and Basic Swimming. Swimming and life-saving techniques activities were conducted for both the control and experimental groups wherein their performance was measured as to speed and endurance using an arbitrary rubric. The conduct of the study was held at JBLFMU-Arevalo, Villa, Iloilo City, Philippines.

2.3 Instrument

A researcher-made questionnaire was used to assess the level of knowledge and skills of the participants. It was validated by a panel of experts and underwent reliability-testing using Cronbach alpha with 0.77 reliability coefficient. The instructional material in the form of module used was composed of knowledge and skill-based. This module consisted of Introduction, Learning Outcomes or Objectives, Pretest, Content or Subject Matter, Posttest or Assessment, Enrichment Activities, and References. The module also contained printed illustrations and video presentation through a CD (compact disc) attached to have a faster simulation of the learning activities.

2.4 Data Collection

An intervention through the use of the instructional materials (module) was employed to the experimental group for the whole semester while the control group was exposed to traditional method of instruction which is lecture. After a semester, the posttest was then administered for both groups after the interventions have been employed.

2.5 Data Analysis

Meanwhile, the statistical tools used were mean, standard deviation, Mann-Whitney, and Wilcoxon-Signed Ranks set at .05 alpha to determine the significant difference between groups and tests. In addition, Cohen's d effect size was used to measure the effectiveness of the instructional material to the knowledge and skills of students in swimming and life-saving techniques. Tables 1 and 2 presents the mean scale, description, and indicators in measuring the knowledge and skills in advanced swimming and life-saving techniques.

Table 1. Mean scale, description, and indicators in measuring the knowledge in advanced swimming and life-saving techniques.

Mean scale	Description	Indicators
31.01-40.0	Outstanding	Students have an exceptional information and understanding in advanced swimming and life-saving techniques.
24.01-31.0	Very good	Students have great information and understanding in advanced swimming and life-saving techniques.
16.01-24.0	Good	Students have suitable information and understanding in advanced swimming and life-saving techniques.
8.01-16.0	Fair	Students have slight information and understanding in advanced swimming and life-saving techniques.
1.00-8.0	Poor	Students have low information and understanding in advanced swimming and life-saving techniques.

Table 2. Mean scale, description, and indicators in measuring the skills in advanced swimming and life-saving techniques.

Mean scale	Description	Indicators
4.51-5.0	Excellent	The students were fully aware of the basic principles of life-saving.
3.51-4.50	Very good	The students were aware of the basic principles of life-saving.
2.51-3.50	Good	The students were somewhat aware of the principles of life-saving.
1.51-2.50	Fair	The students were slightly aware of the principles of life-saving.
1.0-1.50	Needs improvement	The students were not aware at all of the basic principles of life-saving.

3 RESULTS AND DISCUSSION

3.1 Score Performance of the Experimental and Control Groups on Knowledge in Swimming and Life-Saving Techniques

The pretest was initially conducted to determine the comparableness between the experimental and the control groups in terms of knowledge. The posttest was given to the respondents after the experiment. Table 3 shows the pretest scores among the experimental and the control groups. Twenty students composed the experimental group and 20 for the control group. The experimental group's pretest mean score is "Fair" (M = 13.05) while the controls group's mean score is also "Fair" (M = 13.35). It means that students have slight information and understanding in advanced swimming and life-saving techniques. It was noted that the experimental and control groups registered comparably the same mean scores in the pretest, indicating their almost identical knowledge levels before the experiment. Lana [52] expresses that both groups start at the assumption that both experimental group and control group are of the same level. An almost negligible higher difference on the mean was noted on the control group. However, no other notable differences were noted between groups.

Table 4 shows the posttest scores among the experimental and the control groups. The experimental group's posttest mean score is "Good" (M = 17.50) which means that students have suitable information and understanding in advanced swimming and life-saving techniques while that of the control group is still "Fair" (M = 13.50) which means that students have slight information and understanding in advanced swimming and life-saving techniques. On the other hand, the experimental group manifested a higher mean score in the posttest than the control group, implying the experimental group's better performance in terms of knowledge ability after the experiment. This is conjunction to the study of Foster, Shurtz, and Pepper [53] that imply results of higher ratings after enhancing and utilizing developmental processes on instructional models.

Table 3. Pretest score performance of the experimental and control groups on knowledge in swimming and life-saving techniques.

Compared group	N	M	Description	SD
Experimental	20	13.05	Fair	2.91
Control	20	13.35	Fair	2.66

Table 4. Posttest score performance of the experimental and control groups on knowledge in swimming and life-saving techniques.

Compared group	N	M	Description	SD
Experimental	20	17.50	Good	3.27
Control	20	13.50	Fair	3.94

3.2 Significant Difference on the Score Performance between the Experimental and Control Groups on Knowledge in Swimming and Life-Saving Techniques

Table 5 reveals that the obtained significance value is higher than 0.05 which means that the two pretest mean scores shows no significant difference, $U = 196.50$, $p = 0.924$. Lana [51] sets further examples on the context of significance between pretest differences. However, the results may vary depending on the pretest sensitization.

Table 6 shows that the obtained significance value is lower than the significance value of 0.05 which indicates that the difference between the two mean scores is significant, $U = 91.50$, $p = 0.003$. This is in relation to the study of Rasberry et al. [54], they agreed on the significant difference between groups which attributes on both skill and academic performance.

3.3 Significant Difference on the Pretest and Posttest Score Performance of the Two Groups on Knowledge in Swimming and Life-Saving Techniques

The students' pretest and posttest mean scores were compared to determine the significance of their difference. Table 7 revealed that there is a significant difference between the experimental group's performance before and after the treatment, $Z = -3.45$, $p = 0.001$. The experimental group's knowledge performance after the treatment is significantly better than before the treatment. Skills and performance increase can be largely attributed to the successive

activities flow that was associated with activity based curricula as suggested by Metzler [55].

Table 5. Mann-Whitney test result for the significant difference on the pretest score performance between the experimental and control groups on knowledge in swimming and life-saving techniques.

Compared group	U	W	Z	Asymp. sig. (2-tailed)
Experimental	196.50	406.50	-0.096	0.924
Control				

Table 6. Mann-Whitney test result for the significant difference of the posttest score performance between the experimental and control groups on knowledge in swimming and life-saving techniques.

Compared group	U	W	Z	Asymp. sig. (2-tailed)
Experimental	91.50*	301.50	-2.95	0.003
Control				

Asterisk (*) means significance at 0.05 level of probability.

Table 7. Wilcoxon-signed ranks test result for the significant difference on the pretest and posttest score performance of the experimental group on knowledge in swimming and life-saving techniques.

Compared test	Z	Asymp. sig. (2-tailed)
Pretest	-3.45*	0.001
Posttest		

Asterisk (*) means significance at .05 level of probability.

Table 8 shows that there is no significant difference between the pretest and posttest score, $Z = -2.41$, $p = 0.810$. The table further shows that the control group's posttest performance is not significantly better than their pretest performance. The study of Diamond, Maerten - Rivera, Rohrer, and Lee [56] had the same results as the control group's lack of progress on the posttest results.

Table 9 shows the mean gains of the experimental and control groups. It shows that the experimental group is higher than the control group in their mean gain scores. Results denote that curricular intervention affects academic achievement and psychology [57].

Table 8. Wilcoxon-signed ranks test result for the significant difference on the pretest and posttest score performance of the control group on knowledge in swimming and life-saving techniques.

Compared test	Z	Asymp. sig. (2-tailed)
Pretest	-2.41	0.810
Posttest		

Table 9. Mean gain of the experimental and control groups on knowledge in swimming and life-saving techniques.

Compared group	Pretest	Posttest	Mean gain
Experimental	13.05	17.50	4.45
Control	13.35	13.50	0.15

Table 10 shows that there is a significant difference in knowledge performance in swimming mean gains between the experimental and the control groups, $U = 87.50$, $p = 0.002$. The results show great promise on the outcomes which support the study conducted by

Petrass and Blitvich [58] showing significant increase on knowledge and swimming ability of the respondents.

Table 10. Mann-Whitney test for the significant difference in the mean gain of the experimental and control groups on knowledge in swimming and life-saving techniques.

Compared Group	U	W	Z	Asymp. Sig. (2-tailed)
Experimental	87.50*	297.50	-3.06	0.002
Control				

Asterisk (*) means significance at 0.05 level of probability.

The Cohen's d effect size was 1.048 or greater than 1.0 which has a very large effect size [59, 60] indicating that 84% of the control group (lecture-method) who are below the average person in the experimental group (with module) according to Coe (2002) [61] in terms of students' knowledge in swimming and life-saving techniques.

3.4 Score Performance of the Experimental and Control Groups on Skills in Swimming and Life-Saving Techniques

The pretest was initially conducted to determine the comparableness between the experimental and the control groups in terms of skill levels. The posttest was given to the respondents after the experiment.

Table 11 shows the pretest scores among the experimental and the control groups. Twenty students composed the experimental group and 20 for the control group. The experimental group's pretest mean score is "Fair" ($M = 2.12$) while the control group's mean score is also "Fair" ($M = 2.15$). "Fair" means that majority of the mechanics are incorrect and deviate from the standards. It was noted that the experimental and control groups registered comparably the same mean scores in the pretest, indicating their almost identical skill levels before the experiment. This is in coherence with the study of Aidoo, Boateng, Kissi, and Ofori [62].

Table 12 shows the posttest scores among the experimental and the control groups. The experimental group's posttest mean score is "Excellent" ($M = 4.53$) which means that the entire mechanics are correct and the execution conforms to the standards while that of the control group is "Good" ($M = 3.34$) which means that some of the mechanics are correct with more deviations of the execution based on standards. On the other hand, the experimental group manifested a higher mean score in the posttest than the control group, implying the experimental group's better performance in terms of skill after the experiment. The study of Parr, Edwards, and Leising [63] agrees to the results as interventions utilized sustainable concept learning and deep skills approach.

3.5 Significant Difference of the Score Performance between the Experimental and Control Groups on Skills in Swimming and Life-Saving Techniques

Table 13 reveals that the obtained significance value is higher than 0.05 which means that the two pretest

mean scores showed no significant difference, $U = 190.50$, $p = 0.797$. No significant difference on the pretest scores denotes the uniformity of the respondents between groups. This is supported by Kirk [64] and Lana [52].

Table 11. Pretest score performance of the experimental and control groups on skills in swimming and life-saving techniques.

Compared group	N	M	Description	SD
Experimental	20	2.12	Fair	0.06
Control	20	2.15	Fair	0.08

Table 12. Posttest score performance of the experimental and control groups on skills in swimming and life-saving techniques.

Compared group	N	M	Description	SD
Experimental	20	4.53	Excellent	0.04
Control	20	3.34	Good	0.03

Table 13. Mann-Whitney test result for the significant difference on the pretest score performance between the experimental and control groups on skills in swimming and life-saving techniques.

Compared group	U	W	Z	Asymp. sig. (2-tailed)
Experimental	190.50	400.50	-0.258	0.797
Control				

Table 14. Mann-Whitney test result for the significant difference of the posttest score performance between the experimental and control groups on skills in swimming and life-saving techniques.

Compared group	U	W	Z	Asymp. sig. (2-tailed)
Experimental	0.000*	210.00	-5.43	0.000
Control				

Asterisk (*) means significance at 0.05 level of probability.

Table 14 shows that the obtained significance value is lower than the significance value of 0.05 which indicates that the difference between the two mean scores is significant, $U = 0.000$, $p = 0.000$. The difference denotes progress and skills improvement on swimming which is supported by Parr, Edwards, and Leising [63].

3.6 Significant Difference on the Pretest and Posttest Score Performance of the Two Groups on Skills in Swimming and Life-Saving Techniques

The students' pretest and posttest mean scores were compared to determine the significance of their difference. Table 15 shows that there is a significant difference between the experimental group's performance before and after the treatment, $Z = -3.92$, $p = 0.000$. The experimental group's performance after the treatment was significantly better than before the treatment. Implications of the study denote curriculum intervention effectivity as gains agree on outcomes during the conduct of instruction [65].

Table 16 shows that there is a significant difference between the pretest and posttest score, $Z = -0.92$, $p = 0.000$. The table further shows that the control group's posttest performance was significantly better than

their pretest performance. This shows that majority of young adults have sound swimming and skills [58].

Table 15. Wilcoxon-signed ranks test result for the significant difference on the pretest and posttest score performance of the experimental group on skills in swimming and life-saving techniques.

Compared test	Z	Asymp. sig. (2-tailed)
Pretest	-3.92*	0.000
Posttest		

Asterisk (*) means significance at 0.05 level of probability.

Table 16. Wilcoxon-signed ranks test result for the significant difference on the pretest and posttest score performance of the control group on skills in swimming and life-saving techniques.

Compared test	Z	Asymp. sig. (2-tailed)
Pretest	-0.92*	0.000
Posttest		

Asterisk (*) means significance at 0.05 level of probability.

Table 17 shows the mean gains of the experimental and control groups. It shows that the experimental group is higher than the control group in their mean gain scores. Matton, Vautier, and Raufaste [66] imply that an increase in mean gain scores means that there is an improvement on the specified target abilities as in this case, swimming skills.

Table 18 shows that there is a significant difference in skills performance in swimming mean gains between the experimental and the control groups, $U = 0.000$, $p = 0.000$. Matton, Vautier and Raufaste [66] and Shidler [67] added that a larger time spent on coaching proves greater mean scores. At the same time, the attention of respective coaches brings bearing to skill development and maturation [68].

Table 17. Mean gain of the experimental and control groups on skills in swimming and life-saving techniques.

Compared group	Pretest	Posttest	Mean gain
Experimental	2.12	4.53	2.41
Control	2.15	3.34	1.19

Table 18. Mann-Whitney test for the significant difference in the mean gain of the experimental and control groups on skills in swimming and life-saving techniques.

Compared group	U	W	Z	Asymp. sig. (2-tailed)
Experimental	0.000*	210.00	-5.41	0.000
Control				

Asterisk (*) means significance at 0.05 level of probability.

The Cohen's d effect size was 3.303 or greater than 3.0 which has a very large effect size [59, 60] indicating that 99.9% of the control group (lecture-method) who are below the average person in the experimental group (with module) according to Coe [61] in terms of students' skills in swimming and life-saving techniques.

4 CONCLUSIONS

Above results showed promising results on the applicability and effectiveness of the intervention on both knowledge and performance of students. Mean gain on both knowledge and skills performance

implies achieving the target learning output and skills display. This study further concludes that the youth have inherent skills on swimming as part of their survival instincts as basic instructions were given to the control group however, achieving yet significant results on posttest skills performance. This study adds that the medium effect size on knowledge performance and large effect size on skills performance conceives the true nature of instruction of swimming which mainly focuses on skills performance.

Since this study shows that the developed instructional material has been proven effective in enhancing the swimming performance and lifesaving techniques of students both in aspects of knowledge and skills, the utilization of this module is highly recommended among maritime institutions offering swimming and life-saving courses. This study also recommends further research on the inherent swimming skills of the youth using larger sample size.

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