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Water Survival Skills and Swimming Performance of BSMT Students: A Sequential Explanatory Study

By Krystel Joyce V. Repalda

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Water Survival Skills and Swimming Performance of BSMT Students: A Sequential Explanatory Study

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1. INTRODUCTION

Maritime students are struggling with poor swimming performance, which is compromising their ability to respond effectively in aquatic emergencies (Mitishev & Sozonov, 2024). This subpar performance is resulting in diminished overall effectiveness and raising concerns about safety in real-life scenarios. Ultimately, the students' inadequate swimming abilities are hindering their ability to succeed in their maritime education and future careers (Duijn et al., 2022).

Despite being a highly competitive sport, swimming has faced challenges in sustaining its global prominence. Hunter et al. (2023) observed a decline in the United States swimming performance, with nations like Japan and Russia narrowing the gap. He attributed this decline to insufficient investment in grassroots programs and a failure to adapt to evolving trends in the sport. Tawanda and Tsara (2022) examined Africa's swimming performance and highlighted challenges in maintaining long-term success, citing a shallow talent pool and limited coaching and training resources. Similarly, Petrenko and Taran (2021) explored the difficulties Russian swimmers face in international competitions. He pointed out that inadequate investment in infrastructure and training facilities, along

with limited competitive opportunities, has hindered the country's swimming development.

In the Philippine context, it has faced challenges in developing world-class swimmers, with its swimming performance trailing behind neighboring Southeast Asian countries. Rosario (2024) identified a lack of investment in swimming infrastructure and programs as a major barrier, leading to a shortage of trained coaches, inadequate training facilities, and limited competition opportunities. Celso (2025) noted that Filipino swimmers struggle to meet international standards due to limited exposure to high-level competition and insufficient support systems. Blanco (2022) emphasized the need for a more structured and systematic approach to swimming development, highlighting the lack of clear vision and coordination among key stakeholders, including coaches, athletes, and government agencies.

Despite the critical importance of swimming skills in maritime schools and industries, there is a significant gap in existing literature and training programs that address the specific challenges faced by maritime students and professionals. While studies and training programs on general swimming skills exist, there is a lack of research and initiatives tailored to the unique demands of the maritime industry. Addressing this gap is crucial, as inadequate swimming skills among maritime students and professionals can lead to serious consequences, including accidents and loss of life. With increasing regulatory requirements and safety standards in the maritime industry, urgent training programs are needed to ensure safety and compliance.

This research highlights the significance of water survival skills in enhancing swimming performance among Physical Education BSMT students, emphasizing its critical role in maritime training. Understanding this relationship is essential, as water survival mastery boosts confidence, stamina, and emergency readiness—key attributes for safety and performance in maritime environments. The findings aim to improve training strategies and curricula to better prepare students for the physical demands and challenges of maritime careers. Beneficiaries include CHED officials, who can use the insights to enhance curriculum standards; school administrators, who can refine maritime programs; PE teachers, who can tailor instruction to student needs; maritime students, who

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gain improved training; and future researchers, who can build on this comprehensive analysis for further innovations.

This study aimed to determine the significance of water survival skills as a factor of swimming performance; and to explore experiences on water survival among study participants. Specifically, it seeks to determine whether water survival skills significantly influence swimming performance and to identify which specific survival skills explain variations in overall performance, describe the level of Water Survival Skills and Swimming Performance among the BSMT students, and determine the significant relationship between water survival skills and swimming performance among BSMT students. Further, this study sought to answer the following question: What are the water survival experiences of the study participants that contribute to their swimming performance?

The following hypothesis was tested at a 0.05 level of significance: Water survival skills and swimming performance are not significantly correlated. Meanwhile, the assumption of this study is that the experiences of BSMT students on reflexive movements would lead to their fundamental movements.

This study is anchored in Harrow's (1972) Psychomotor Learning Theory. The theory posits that this taxonomy is organized according to the degree of coordination, including involuntary responses and learned capabilities: reflex movements - automatic reactions, basic fundamental movement - simple movements that can build to more complex sets of movements, perceptual - environmental cues that allow one to adjust movements, physical activities - things requiring endurance, strength, vigor, and agility, skilled movements - activities where a level of efficiency is achieved, non-discursive communication - body language.

In this study, the automatic reactions variable is indicated by flexion, extension, stretch, and postural adjustment. (Harlow, 1972) aligns with reflexive movements and exhibits foundational psychomotor abilities such as floating, treading water, breath control, and coordinated reflexive actions crucial for survival in aquatic environments, as discussed in the theory. The physical activities indicated by strenuous effort for long periods, muscular exertion, a quick, wide range of motion at the hip joints, and quick, precise movements (Harrow, 1972) are aligned with basic fundamental movements that encompass skills such as strength, endurance, agility, and coordination that support more complex and purposeful physical tasks as included in the theory. Other elements explained in the theory, such as fundamental movement, perceptual, skilled movements, and non-discursive communication, are excluded.

II. METHOD

This study employed sequential explanatory mixed-methods design (Creswell & Creswell, 2017), prioritizing quantitative data followed by qualitative analysis to enhance ecological validity.

The study was conducted at a private maritime institution in Davao City's Población District, focusing on Maritime Department students in transportation and engineering programs.

For the Quantitative Phase, using Yamane's formula (1967, cited in Hasan & Kumar, 2024), 267 BSMT students were randomly selected from 800 second-years. For the Qualitative Phase, five highest-scoring BSMT students were purposively selected based on researcher judgment for useful information provision.

For the Quantitative Phase, a 40-item adapted questionnaire assessed water survival skills (Moran et al., 2011; Stallman et al., 2017) and swimming performance (Pyne et al., 2004; Langendorfer, 2015). For the Qualitative Phase, open-ended interviews explored BSMT students' experiences comprehensively (Creswell & Poth, 2016; Patton, 2014), requiring careful design and piloting (Lim, 2025).

Both quantitative surveys and qualitative interviews were conducted after securing ethical clearance, ensuring comprehensive data collection through systematic monitoring and transcription processes.

The quantitative data was analyzed using Mean calculations and linear regression analysis to determine the water survival skills' influence on swimming performance using established correlation interpretation schemes. Meanwhile, the qualitative data was analyzed using Thematic analysis to identify patterns and insights from interview responses using systematic coding approaches (Braun & Clarke, 2006; Lochmiller, 2021).

Credibility through prolonged engagement (Adler, 2022), confirmability via audit trails (Amin et al., 2020), dependability through coding systems (Haq et al., 2023), authenticity ensuring genuine representation (Ahmed, 2024), and transferability through detailed descriptions (Riazi et al., 2023) established trustworthiness (Creswell & Creswell, 2017).

The researcher ensured the protection of participants' confidentiality (Pring, 2024), voluntary participation principles (Mumford et al., 2021), and harm minimization strategies (Picketts et al., 2021) with institutional approval.

III. RESULTS AND DISCUSSION

The results of the analysis and interpretation of the gathered data are presented. Specifically included are the descriptive analysis, correlation analysis, modified paradigm, emerging themes and subthemes, and the summary of findings.

a) *Descriptive Analysis*

Table 1 is the descriptive table. It contains the variables involved in the study, namely, water survival and swimming performance, and their respective

indicators. It also contains the number of samples, standard deviation, the mean, and the corresponding descriptive interpretations

Table 1: Descriptive Table

Variable	n	SD	Mean	Descriptive Level
Water Survival Skills	267	1.00	3.25	Moderate
Technique		0.99	3.26	Moderate
Adaptability		0.99	3.35	Moderate
Endurance		0.99	3.23	Moderate
Self-reliance		1.02	3.14	Moderate
Swimming Performance	267	0.87	4.18	High
Efficiency		0.92	4.10	High
Strength		0.88	4.17	High
Speed		0.86	4.23	Very High
Accuracy		0.84	4.20	Very High

Specifically, Table 1 shows that the water survival skills variable obtained an overall mean score of 3.25, described as a moderate level. This indicates that the water survival skills of second-year BSMT students are good, affirming Ekanayaka et al. (2021) and Kim et al. (2022) findings on training effectiveness.

Moreover, the findings reveal that the overall swimming performance obtained a mean score of 4.18, which is described as a high level. This indicates that the swimming performance of second-year BSMT

students is very good, corroborating Guo et al. (2022) and Lopes et al. (2021) training structure studies.

b) *Correlation Analysis*

Table 2 is the correlation table. It specifically contains the predictive variable, which is water survival skills, and the criterion variable, which is the swimming performance of second-year BSMT students. Lastly, it contains the r-value, the p-value, and the decision on the hypothesis.

Table 2: Correlation Table

Independent Variable	Swimming Performance			
	r-value	p value	Decision on Ho @ 0.05	Interpretation
Water Survival Skills	0.561	0.000	Rejected	Significant

Table 2 shows that the correlation between water survival skills and swimming performance obtained a p-value of 0.000, which is less than 0.05 level of significance. Therefore, the null hypothesis was rejected, confirming a statistically significant moderate relationship between the two variables. Furthermore, such a correlation obtained an r-value of 0.561, indicating a moderately positive strength. Water survival skills and swimming performance showed moderate positive correlation, supporting Duijn et al. (2022) and Denny et al. (2021).

experiences raised by the participants. The following themes emerged: technique development, independence in water survival, and building confidence.

c) *Modified Paradigm*

Figure 1 shows the modified paradigm of this study. In this paradigm, three emerging themes from the data collected were generated, describing their experiences. The following are the accounts of the

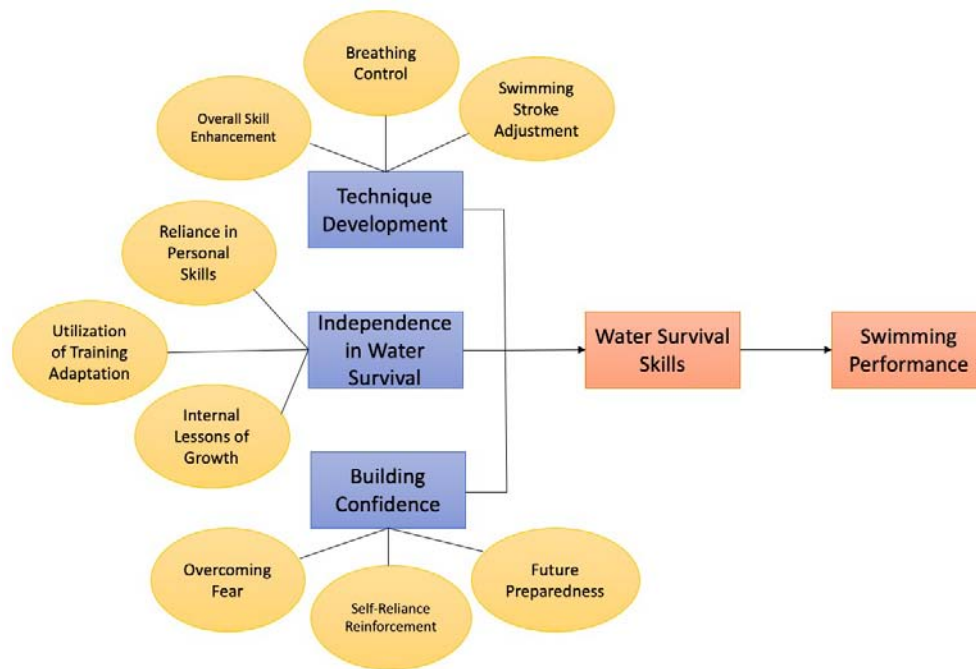


Figure 1: The Modified Paradigm of the Study

These emerging themes were supported and justified by the testimony of the participants during In-depth interviews. Table 3 shows the emerging themes on the experiences of BSMT in refining their water survival skills and improving their swimming performance.

Table 3: Emerging Themes on the Experiences of BSMT Students in Refining their Survival Skills and Improving their Swimming Performance

Discourse and Dimensions	Extracted Statements
Technique Development ^a Swimming Stroke Adjustment	<p>"Even with small improvements in my swimming, like raising my elbow and smoothing my arm movements, I noticed that I do not get tired or run out of breath easily anymore. By extending my arms with each stroke and keeping my body straight, I can swim faster and more easily." (IDI-Participant 3, L48-50)</p> <p>"By focusing on small changes in my stroke, like staying relaxed at the start of each movement and gliding smoothly through the water, I learned how to float without struggling. Swimming faster while keeping the correct body position is a big improvement for me." (IDI-Participant 2, L73-77)</p> <p>"I discovered that small but regular improvements in my swimming style like using long, even strokes and keeping my head relaxed—really helped me save energy. I also used resistance training, like swimming with a buoy or fins, and short sprints, but I still kept the correct stroke position even when my speed changed." (IDI-Participant 5, L30-33)</p>
Breathing Control	<p>"When I learned how to control my breathing slowly, exhaling underwater and breathing at the right time to match my strokes, it helped me stay calm even when I felt nervous. Because I now breathe and stroke properly, I can float in a relaxed way and save energy through smooth movements instead of struggling while swimming." (IDI-Participant 1, L40-44)</p>

	<p>"Learning to control my breathing really helped me. I practiced exhaling underwater so I could take deep breaths when I turned my head. When I swim alone, I do breathing exercises that feel like panic situations so I can learn to stay calm and keep my heart rate steady." (IDI-Participant 2, L45-50)</p> <p>"I try to keep my face underwater longer by taking quick but proper breaths, and this helps me swim more smoothly. I do not breathe all the time, but when I do, I take deep breaths. This helps keep my body straight and avoids too much head movement that can slow down my swim." (IDI-Participant 3, L51-55)</p>
<p>Overall Skill Enhancement</p>	<p>"I noticed that because my stroke, breathing, and technique improved, I can now swim longer without getting tired easily." (IDI-Participant 1, L27-29)</p> <p>"The change in my technique—from better strokes to proper breathing—really helped me stay afloat and swim farther. That experience taught me to trust myself, especially during emergencies." (IDI-Participant 3, L30-33)</p> <p>"Since my movements in the water are smoother now, it became the source of my confidence in swimming while still having enough energy left. Because of that experience, I realized I really need to keep practicing." (IDI-Participant 4, L34-37)</p> <p>"The combination of good technique, correct breathing, and practiced skills helped me trust myself in long-distance swimming." (IDI-Participant 5, L38-40)</p>
<p>Independence in Water Survival^b</p> <p>Reliance on Personal Skills</p>	<p>"Oh my... there was a time I was swimming and did not realize I had reached a sudden drop-off, and it was already very deep...I just kept my presence of mind, so instead of asking for help, I stayed calm and slowed down my strokes. I still felt like I had enough energy, and my breathing stayed steady. Because I was careful, I was able to slowly get back to a safe place." (IDI-Participant 2, L67-71)</p> <p>"I had an experience I will never forget... it was when a really strong wave pulled me far from the shore, and I was all alone. It was so scary! But I stayed calm and used my presence of mind. I applied what I knew — smooth freestyle swimming and proper breathing — so I could move through the water and escape the strong waves." (IDI-Participant 3, L52-56)</p> <p>"Umm... because I focused and moved my hands smoothly, I was able to get through the waves without sinking, and I stayed balanced the whole time. I think it was really because of the strength and proper movement of my whole body that I did not panic and was able to keep swimming until I reached a safe place." (IDI-Participant 5, L31-34)</p>
<p>Utilization of Training Adaptation</p>	<p>"My confidence really developed because of regularly practicing emergency drills, including improving my strokes and practicing proper breathing." (IDI-Participant 1, L25-28)</p> <p>"Ahhh... for me, I use interval training like swimming fast then slowing down after, taking turns so I can rest a bit. It really helps build my strength and control the proper body position while swimming." (IDI-Participant 2, L78-81)</p> <p>"For me, because my stroke improved, I can swim faster now, so when there was a strong wave, I was able to avoid it. My controlled breathing also really helped keep my heartbeat calm and steady." (IDI-Participant 4, L82-84)</p> <p>"It was really good, to be honest... because it helped me maintain the correct stroke even when my swimming speed changed. In one practice, I really had to swim fast to get a life jacket that was floating away." (IDI-Participant 5, L85-88)</p>

Internal Lessons for Growth

"For me, staying calm and focused came from practicing how to handle stressful situations. I learned that if you already know what to do, you will not panic easily. The technique I practiced helped me trust myself during emergencies." (IDI-Participant 3, L30-33)

"For me, that moment proved that all my effort to improve my stroke and trust my instinct was really worth it. Even if it was hard, I trusted the way I practiced." (IDI-Participant 2, L54-56)

"The small changes in my swimming, like smoother strokes and relaxed breathing, helped me avoid getting tired quickly. It also helped me stay in control even when the waves were strong and gave me the confidence to swim farther with energy left." (IDI-Participant 5, L57-60)

Building Confidence °

Overcoming Fear

"I will never forget that surprise survival exercise in open water. Even though the waves were really strong, using the right swimming technique helped me stay calm. I did not focus on the fear of sinking—I just focused on getting to safety." (IDI-Participant 1, L12-15)

"During our coastal swim with strong waves, I realized I could keep swimming confidently because my arms did not get tired, and my breathing was still okay. I was able to keep the right body position in the water and escape the waves—ha-ha-ha—without panicking."

(IDI-Participant 2, L39-42)

"You know, I had this one experience, oh my God!... I fell off the boat I was riding, and I did not even have a life vest. So, I told myself to just stay calm while waiting for help. I used my improved stroke and breathing skills, stayed floating, and made sure I did not waste all my energy." (IDI-Participant 3, L43-47)

Self-Reliance Reinforcement

"Ahhh... one time, I experienced being pulled by the waves away from the shore, and the worst part was—I did not have anyone with me to help. So I used my smooth freestyle stroke and controlled breathing, then swam diagonally to escape the strong pull of the waves."

(IDI-Participant 3, L71-75)

"During a weekend trip, I got separated from my group in the deeper part of the sea. Instead of panicking, I recalled my training—I controlled my breathing, slowed down my strokes, and chose the easiest and smoothest path back to shore. I really trusted myself while checking my direction and swam with confidence." (IDI-Participant 4, L76-80)

"I practice being independent in the water by training alone sometimes. That one time, I was snorkeling when I suddenly got pulled by a strong underwater current. It was really difficult... but I pushed myself to face the challenge even without anyone to depend on. That moment truly tested my self-reliance." (IDI-Participant 5, L81-86)

Future Preparedness

"Honestly, because my freestyle has really improved, I can now swim farther without getting tired quickly. I stay more focused on my goal instead of worrying about drowning. Now, I feel more ready for long-distance swimming—I am more confident, and it feels easier for me." (IDI-Participant 1, L82-85)

"Ahmm... I am happy because I have improved in my stroke, breathing, and overall skills. I can now swim longer distances without losing energy too fast. These improvements really helped me—both physically and mentally—so I can be prepared for unexpected challenges in the water." (IDI-Participant 2, L21-24)

"Since I worked on improving my swimming technique, I now trust myself more and believe I can handle long-distance swimming. I now have lasting strength, and I am ready to face long swims, especially in case of water emergencies." (IDI-Participant 4, L19-22)

d) *Technique Development*

Technique development represents a comprehensive process where BSMT students refine physical swimming abilities while cultivating essential professional qualities like discipline, confidence, and preparedness. This paradigm transcends mere skill acquisition, recognizing that mastered techniques could determine survival outcomes in maritime emergencies, thereby motivating deeper commitment to excellence. Rigorous training strengthened technique and endurance, confirming Ekanayaka et al. (2021) and Petrass et al. (2021) structured training benefits.

Swimming Stroke Adjustment: Swimming stroke adjustment involves modifying and refining stroke mechanics to enhance efficiency, conserve energy, and adapt to varying water conditions. Participants demonstrated that small, consistent improvements—like proper elbow positioning, smooth arm movements, and body alignment—significantly impact endurance and performance, proving that incremental progress builds substantial swimming competence. Modified stroke mechanics enhanced efficiency and energy conservation, affirming Seifert and Carmigniani (2023) and Riyanto et al. (2025).

Breathing Control: Breathing control encompasses regulating respiratory patterns to maintain composure during demanding water conditions. Participants mastered underwater exhalation, stroke-synchronized breathing, and panic-simulation exercises. This skill reduces anxiety, conserves energy, prevents fatigue, and enables swimmers to maintain proper form while developing mental focus essential for survival situations. Synchronized breathing improved swimming rhythm and stress management, supporting Ceviz (2024) and Grossman et al. (2021) research findings.

Overall Skill Enhancement: Overall skill enhancement integrates stroke technique, breathing control, endurance, and decision-making improvements. Participants experienced holistic development where refined mechanics improved efficiency, controlled breathing enhanced mental calmness, and combined skills fostered greater confidence. This comprehensive approach optimizes energy use and prepares swimmers for effective emergency responses. Integrated swimming techniques led to improved endurance and stability, confirming Riyanto et al. (2025) and Reichmuth et al. (2021).

e) *Independence in Water Survival*

Independence in water survival emphasizes BSMT students' ability to rely on personal skills and decision-making during challenging aquatic situations. This paradigm highlights how training and technique development build confidence, maintain composure under pressure, and manage emergencies without external assistance, reflecting professional maritime

readiness standards. Immersive training cultivated student independence in water survival scenarios, affirming Downey (2021) and Petrass et al. (2021) findings.

Reliance on Personal Skills: Reliance on personal skills involves trusting abilities, training, and decision-making to handle water emergencies effectively. Participants demonstrated presence of mind during unexpected deep-water encounters and strong wave situations. Their experiences show how rigorous training enables independent navigation of high-pressure scenarios, enhancing personal safety and professional readiness. Students developed self-reliance through applying survival strategies independently, supporting Chiong (2023) and Riyanto et al. (2025) studies.

Utilization of Training Adaptation: Training adaptation refers to applying, adjusting, and refining learned techniques when facing unpredictable conditions. Participants successfully modified stroke patterns, breathing techniques, and energy management based on real-time challenges. This adaptive capability empowers critical thinking, composure maintenance, and effective decision-making during high-pressure maritime scenarios. Adapting training to real scenarios built survival autonomy, confirming Viktorelius and Selberg (2022) and Riyanto et al. (2025).

Internal Lessons for Growth: Internal lessons for growth encompass personal realizations and mindset shifts arising from overcoming water survival challenges. Participants developed self-awareness, resilience, and confidence through stressful situation management. These lessons strengthen abilities to maintain calmness, make intelligent decisions, and grow through each experience, building comprehensive survival competence. Repeated realistic challenges built resilience and mental toughness, supporting Rasyid et al. (2023) and Fazeli et al. (2024).

f) *Building Confidence*

Building confidence involves developing trust in abilities through consistent practice, skill refinement, and realistic scenario exposure. This confidence enables individuals to maintain composure, make quick decisions, and effectively apply survival techniques during challenging water situations, forming the foundation for maritime professional competence. Consistent water survival drills overcame fear and built self-assurance, affirming Stillwell and Khatchaturian (2020) and Stanley (2021).

Overcoming Fear: Overcoming fear involves gradually managing anxiety through supportive, guided water experiences. Participants successfully transformed fear into focused action during surprise exercises and emergency situations. By concentrating on techniques rather than potential dangers, they developed trust in abilities and maintained composure in aquatic

environments. Students gained confidence facing water-based fears through controlled training, supporting Roche et al. (2022) and Jaskiewicz et al. (2022).

Self-Reliance Reinforcement: Self-reliance reinforcement strengthens students' ability to trust skills and judgment during challenging situations. Participants successfully handled separation from groups, strong currents, and emergency scenarios independently. These experiences demonstrate how preparation fosters calm decision-making and capability under pressure, building essential maritime professional confidence. Survival drills without assistance reinforced student self-reliance and confidence, affirming Merlin et al. (2024) and Thanvisitthpon (2025).

Future Preparedness: Future preparedness represents readiness gained through training that equips individuals for unexpected water emergencies. Participants developed physical skills, mental resilience, and strategic thinking necessary for calm, efficient responses. Improved techniques transformed both ability and mindset, fostering goal-oriented focus and positive outlook in challenging maritime endeavors. Refined techniques prepared students for maritime demands, supporting Casey et al. (2021) and Doremidov (2024) training effectiveness studies.

g) Conclusion and Qualitative Results

Based on the results of the study, it is concluded that water survival skills are a significant factor in swimming performance. This conclusion affirms psychomotor learning theory, which posits that psychomotor taxonomy is organized according to the degree of coordination, including involuntary responses and learned capabilities: reflex movements - automatic reactions, basic fundamental movement - simple movements that can build to more complex sets of movements, perceptual - environmental cues that allow one to adjust movements, physical activities - things requiring endurance, strength, vigor, and agility, skilled movements - activities where a level of efficiency is achieved, non-discursive communication - body language.

The water survival experiences of study participants are swimming stroke adjustment, breathing control, and overall skill enhancement as technique-developed experiences; reliance on personal skills, utilization of training adaptation, and internal lessons of growth as independence in water survival experiences; and overcoming fear, self-reliance, and future preparedness as building confidence experiences.

IV. RECOMMENDATIONS

Based on the conclusion and qualitative results, it is recommended that further sequential explanatory mixed study may be conducted using other variables to trace the 43.9% variance in the swimming performance.

Furthermore, maritime training programs that integrate structured, progressive water survival drills into the curriculum may be defined to enhance the psychomotor development and swimming performance of BSMT students. These initiatives contribute to greater preparedness, confidence, and competence in handling real-life maritime emergencies.

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