Technical Analysis of the Freestyle Stroke in the University Swimming Club

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Abstract
From these various perspectives, it can be concluded that freestyle swimming is a fundamental swimming technique that is efficient and easier than other swimming styles, utilizing an arm-swinging motion over the water's surface. To master these techniques, students must be self-motivated to improve their basic swimming skills. The purpose of this study is to determine the level of mastery of basic freestyle swimming techniques among students enrolled in the Swimming Course in the Physical Education, Health, and Recreation Program. This study is a descriptive study aimed at describing how to analyze the basic freestyle swimming techniques of students in the Swimming Club. The sampling technique used was purposive sampling, which involves selecting a sample based on specific criteria; in this study, the sample consisted of 30 students. The overall results of the study, which involved 30 students from the Swimming Club at Cipta Wacana Christian University as the sample, showed that the level of mastery of freestyle swimming techniques was 67%, which is considered good, with an error rate of 33%.

1. Introduction

One way to foster well-rounded individuals is by nurturing the younger generation through sports. The Indonesian government is implementing development in various fields, one of which is education. Education is fundamentally aimed at improving quality, particularly in terms of learning outcomes. In this regard, learning outcomes are influenced by several factors, including: the instructors' capabilities in the teaching and learning process (PBL), their knowledge, educational background, performance, and sense of responsibility in the field of education (Surahman, 2018). One of the sports in physical education is swimming. According to Pradana & Noval (2018), swimming is a complex sport; every swimming movement requires the use of various body parts, particularly the head, arms, and legs. A similar view is expressed by Hamsa (2015), who states that swimming is a water sport that is highly suitable for everyone and is an enjoyable activity. Meanwhile, according to (Ahmad, Tangkudung, Wijaya, & Widiastuti, 2018), swimming is a water-based sport that encompasses other disciplines, such as diving, water polo, synchronized swimming, and open-water swimming. According to (Mulyana, 2013), competitive swimming consists of four strokes: butterfly, backstroke, breaststroke, and freestyle. One of the strokes that is easiest for beginner athletes to master is the freestyle.

The freestyle swimming technique is the most efficient among all swimming strokes, as the arms and legs are used in different ways, allowing for a rest phase during the recovery stroke. According to Sukmawati & Hartoto (2015), freestyle swimming is a stroke that involves swinging the arms over the water's surface, also known as the crawl stroke. The advantages of freestyle swimming include the most efficient arm stroke pattern, low water resistance, and an efficient movement pattern (Rasyid, 2017). From these various perspectives, it can be concluded that freestyle swimming is a fundamental swimming technique that is efficient and easier than other swimming styles, utilizing an arm-swinging motion over the water's surface. To master these techniques, students must be self-motivated to improve their basic swimming skills. According to Syafruddin (2013), a person's success in sports is influenced by two factors: internal and external factors. Internal factors originate from the swimmer themselves, such as physical condition, technique, tactics, and mental state. External factors, on the other hand, include the quality of

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the coach or instructor, available facilities and equipment, as well as the environmental conditions where the learning and teaching process takes place. A similar point is made by (Mulyana, 2013), who notes that swimming achievements are not easily attained, as numerous factors determine a swimmer's performance, such as anatomical factors (arm length, height, leg length); physiological factors (oxygen uptake capacity, agility, balance, coordination, strength, power, flexibility); biomechanical factors (movement speed and stroke frequency); and psychological factors (personality, attribution, achievement motivation, aggression, arousal, anxiety, stress, activation, leadership, communication, commitment, imagery, concentration, self-concept, and self-confidence).

During unit activities, students still make many mistakes, such as incorrect body positioning—the swimmer's body is not aligned with the water's surface, preventing proper buoyancy and making it difficult to swim. Errors in leg movement include bending at the knees, failing to generate power from the hips, and keeping the legs too wide apart, which prevents a long-range propulsion. Errors in arm movements include the elbows entering the water before the hands, a limited forward reach, and pulling the hands too far into the water, causing the swimmer's waist to undulate like a snake moving, while the arm strokes are too short, failing to generate a perfect propulsive force (Leon et al., 2022). Errors in the breathing motion include lifting the head too high during inhalation, causing the body to sink and making swimming more difficult (Mazzolai et al., 2025; Tingle et al., 2024). Meanwhile, errors in coordination (the sequence of movements) occur when, after performing the arm and leg movements, the swimmer does not follow through with the motion or appears to slow down, resulting in movements that are not harmonious or rhythmic (Iorga et al., 2023). Consequently, the swimmer fails to move forward and appears to be held back. According to Thomas (2007), freestyle swimming must integrate the entire sequence of arm strokes, leg kicks, and breathing patterns into a cohesive freestyle movement. According to Bloom (as cited in Sudijono, 2018), analysis is the skill of breaking down or dissecting a subject or situation into smaller parts and understanding the relationships between those parts or factors. Therefore, students taking a swimming course to master the freestyle technique are expected to be able to do so. Based on the various issues raised above, the author argues that new errors may arise and affect the ability to perform freestyle swimming techniques if the aforementioned errors are left unaddressed. Therefore, the author is interested in scientifically demonstrating the analysis of freestyle swimming techniques among students in the swimming activity unit at Cipta Wacana Christian University through a study. The objective of this study is to determine the extent to which students in the swimming activity unit at Cipta Wacana Christian University can coordinate the basic freestyle swimming techniques.

2. Method

This study is a descriptive study. Descriptive research is a research method aimed at describing existing phenomena, whether they are occurring in the present or in the past (Hamidi & Bahruddin, 2015). Its purpose is to systematically and accurately describe the facts and characteristics of the objects or subjects under study. The population in this study consists of students enrolled in the swimming club at Cipta Wacana Christian University. According to the information provided, there are 30 students enrolled in the swimming club. The sampling technique used was purposive sampling, which involves selecting a sample based on specific criteria; in this study, the sample consisted of 30 students. Fifteen students were selected from each class to form the sample.

3. Result and Discussion

This study was conducted at the Jasdam Rampal Swimming Pool in Malang City, beginning at 6:30 a.m. on April 25, 2026, during the student activity club's session. This study examines the "Analysis of Freestyle Technique in the Swimming Student Activity Unit at Cipta Wacana Christian University." During the data collection process, the researcher was assisted by three judges. Based on the three (3) judges' evaluations, using the mean score (NT) for thirty (30) participants in the freestyle swimming technique assessment, this study describes the analysis of the freestyle swimming technique among students in the Cipta Wacana Christian University Swimming Club: body position, hand rotation, leg movement (kicking), breathing, and coordination. To clarify the descriptive research data from the three judges, a detailed explanation is necessary. From the evaluation by the three (3) judges using the mean score (NT) for thirty (30) participants in the freestyle swimming technique, the analysis yielded the highest and lowest scores. The following are the analysis results based on Table 1, showing the distribution of scores from the highest to the lowest.

Table 1. Distribution of Scores for the Freestyle Swimming Technique Assessment

No	Frekuensi Interval Class	Absolut (Fa)	Relatif (%)	Category
1	45-51	5	16,67	Very Poor
2	52-58	4	13,33	Poor
3	59-66	2	6,67	Fair
4	67-73	3	10,00	Good
5	74-80	16	53,33	Very Good
Total		**30**	**100**	-
Average		**72,84**		Good

Based on Table 1 above, of the thirty (30) participants in the study of freestyle swimming techniques among students of the Cipta Wacana Christian University Swimming Club, 16 participants (53.33%) scored 74–80, falling into the "very good" category; 3 participants (10%) scored 67–73, falling into the "good" category; 2 participants (6.67%) scored 59–66, falling into the "fair" category; 4 participants (13.33%) scored 52–58, falling into the "poor" category; and 5 participants (16.67%) scored 45–51, falling into the "very poor" category.

Based on the results of the analysis of freestyle swimming technique mastery, which consisted of the following indicators: body position, hand rotation, kicking, breathing, and coordination, conducted by three judges on a sample of 30 participants. From all indicators or assessments of freestyle swimming technique as a whole, the level of mastery of freestyle swimming technique was found to be 67%, which falls into the "good" category. However, an analysis of each freestyle swimming technique indicator revealed that errors were still present. The level of technical mastery for each freestyle swimming technique indicator among students of the Cipta Wacana Christian University Swimming Club was as follows: the level of technical mastery for the body position indicator was 62.9% with an error rate of 37.1%; for the hand rotation indicator, it was 63.6% with an error rate of 36.4%; followed by the kicking movement indicator at 68.3% and an error rate of 31.7%. Furthermore, the mastery level of the breathing technique was 70% with an error rate of 30%, and the mastery level of the coordination technique was 68.5% with an error rate of 31.5%. Previous research has also examined the analysis of freestyle swimming skills among students in the Swimming 1 course at the Physical Education and Health Education (PJKR) program at STKIP Darussalam Cilacap, as reported by Oktadinata, Mardian, & Maryadi (2017). The results showed that (1) overall, out of 18 participants, 59% were able to perform the arm stroke skill among PJKR students at STKIP Darussalam Cilacap; (2) overall, out of 18 participants, 48% were able to perform the leg kick skill among PJKR students at STKIP Darussalam Cilacap; (3) Overall, 43% of the 18 participants were able to perform the hand breathing skill among PJKR students at STKIP Darussalam Cilacap, (4) Overall, 19% of the 18 participants were able to perform the movement coordination skill among PJKR students at STKIP Darussalam Cilacap. The difference from this study is that the sample consisted of members of the Swimming Club.

Based on the above description, the average level of technical proficiency in swimming techniques overall is categorized as good, whereas the objectives of basic swimming include an understanding of the concepts, history, techniques, and rules of swimming, as well as breaststroke and freestyle skills with gross motor coordination. However, in reality, the techniques performed by students in the Cipta Wacana Christian University swimming club still exhibit errors across all indicators. Swimming is a water-based sport, so athletes must be able to float. Buoyancy is the ability to maintain a body's position above the water's surface. This is the fundamental condition that determines whether a body floats or sinks. If a person's body weight exceeds the maximum buoyancy that water can provide, the body will sink (Kapus et al., 2024). In order for swimmers to meet the requirements necessary for learning and practicing swimming, they must first possess knowledge of swimming techniques and the mechanical principles inherent in swimming itself. Knowledge of swimming stroke techniques must be grounded in specific mechanical principles directly related to swimming movements (Villas-Boas, 2025). A lack of, or neglect

for, this knowledge of mechanical principles will result in slower swimming, particularly in basic swimming for beginners.

One of the factors contributing to errors when performing the freestyle swimming technique is the limited time students have available for swimming. This may be due to transportation difficulties or the long distance between their place of residence and the swimming pool, as students spend a significant amount of money on transportation and food expenses. Most students in the Cipta Wacana Christian University swimming club swim only during scheduled practice times and do not engage in independent practice (Arifin et al., 2024). However, to master proper technique, it is recommended to practice regularly and repeatedly. Another factor that may contribute to errors when performing the freestyle swimming technique is a lack of motor skills or motor educability and self-confidence among students in the Cipta Wacana Christian University swimming club. Motor educability plays a crucial role in the process of learning motor skills, particularly in sports-specific motor skills, especially in freestyle swimming (Pradana & Noval, 2018). Meanwhile, self-confidence plays a vital role in a person's life and has a significant impact on behavior and attitude. A student with strong self-confidence believes they can perform at the level expected by Satiadarma (Pradana & Noval, 2018). This is evidenced by the results of a study (Pradana & Noval, 2018), which found a positive relationship between motor educability and learning outcomes in freestyle swimming among 10th-grade students at Budi Mulia High School in Jakarta, a positive relationship between self-confidence and learning outcomes in freestyle swimming among 10th-grade students at Budi Mulia High School in Jakarta, and a combined positive relationship between motor educability and self-confidence with learning outcomes in freestyle swimming.

One way to address the issues students face with their freestyle technique in the basic swimming course is to attend every in-person session of the basic swimming course and supplement these with additional days of independent practice. In addition, supporting facilities and equipment are needed for the freestyle training process. Furthermore, to improve students' motor skills and self-confidence, regular and repetitive practice is necessary. According to Firdaus (2013), when an action is performed repeatedly, an automatic association forms between the stimulus and the action, between the stimulus and the response. Therefore, to help students succeed in learning the freestyle stroke, training activities must be repeated, giving athletes the opportunity to practice the sequence of the freestyle stroke. Thus, it can be argued that many factors can influence the level of mastery of freestyle swimming technique among students in the Cipta Wacana Christian University swimming club. Therefore, it is essential for instructors and students to conduct joint evaluations to improve their existing freestyle swimming techniques, thereby achieving better learning outcomes. The author also observed a lack of commitment among students to practice outside of scheduled training sessions.

In mastering basic swimming techniques, students are expected to demonstrate strong commitment, as stated by Mulyana (2013): commitment is what drives an individual to make a firm decision and resolve to achieve a goal, even if the individual does not yet know the final outcome of that goal. Swimmers with strong commitment will strive with all their might, work hard, and make sacrifices to achieve their goals, even if everyone else abandons them (Del Bucchia et al., 2025; Xu, 2025). Commitment gives swimmers high motivation and drives them to complete tasks in order to achieve their desired accomplishments. Strong commitment drives swimmers to act selflessly, consistently, and with integrity, as well as to love their profession. Swimmers with high commitment can train tenaciously and diligently, seeking the best ways to complete their tasks effectively and efficiently (Mulyana, 2013). In addition to the factors mentioned above that cause errors when performing the freestyle swimming technique, supporting facilities and equipment are essential for the freestyle swimming training process. According to Thomas (2007), the equipment swimmers need to master good freestyle technique includes: (a) a kickboard, which is very useful for improving swimming movement, especially for leg exercises; (b) a pull buoy, which is the most effective equipment for strengthening arm muscles; (c) fins are personal equipment needed to strengthen and improve leg flexibility, (d) goggles are equipment that can help with vision underwater.

4. Conclusion

Based on the analysis results, the following conclusions can be drawn: the level of technical proficiency for each freestyle swimming technique indicator is as follows: the level of technical proficiency for the body position indicator is 62.9% with an error rate of 37.1%; for the hand rotation indicator, it is 63.6% with an error rate of 36.4%; followed by the kicking movement indicator at 68.3% with an error rate of 31.7%. Furthermore, the mastery level of the breathing technique was 70% with an error rate of 30%, and the mastery level of the coordination technique was 68.5% with an error rate of 31.5%. Thus, the overall

research results from 30 students of the Cipta Wacana Christian University swimming club showed that the level of mastery of freestyle swimming technique was 67%, which falls into the “good” category.

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