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1 Fifth-Grade Students' Knowledge of Basic Swimming Movements at SD Negeri 107430 Galang

Yabes Hizkia Pardede^{1*} and Eka Abdurrahman²

^{1,2} Sekolah Tinggi Olahraga dan Kesehatan Bina Guna, Medan, Indonesia

*Corresponding author: [yabes@gmail.com]

Abstract

Objectives: This study assessed fifth-grade students' knowledge of basic swimming movements at SD Negeri 107430 Galang, with attention to swimming styles, conduct during swimming instruction, and swimming facilities and equipment.

Materials and Methods: A quantitative descriptive survey was conducted with all 29 fifth-grade students selected through total sampling. Knowledge was measured using a 28-item multiple-choice test retained from an initial 30-item pool; the source study reported a reliability coefficient of 0.959. Scores were summarized using descriptive statistics and classified into five norm-referenced categories.

Results: Scores ranged from 10 to 24 with a mean of 19.72 and a standard deviation of 3.26. Eleven students (37.93%) were classified as high, 10 (34.48%) as moderate, seven (24.14%) as low, one (3.45%) as very low, and none as very high. Thus, the high category contained the largest proportion, although 27.59% of students remained in the low or very-low categories.

Conclusions: The group demonstrated generally favorable theoretical knowledge of basic swimming movements, but the distribution indicates meaningful learning gaps. Classroom instruction should therefore be strengthened with systematic water-safety content and, where feasible, supervised practical aquatic experiences and authentic competence assessment.

Keywords: aquatic education; basic swimming movements; elementary school; knowledge assessment; water safety

Introduction

Aquatic education is an important component of physical education because it supports lifelong participation in physical activity while also developing knowledge and behaviors relevant to safety in and around water. Contemporary scholarship treats aquatic competence as broader than mastery of formal strokes: it includes entry and exit, breath control, buoyancy, orientation, propulsion, risk appraisal, and context-sensitive decision making (Taylor et al., 2020; van Duijn et al., 2021). For elementary-school learners, theoretical understanding can provide an important foundation, but it should ultimately be connected to supervised practice and direct assessment of aquatic skills.

Access to swimming instruction is not equally distributed. Facilities, family resources, previous learning opportunities, and the environment in which children learn may shape both perceived and actual competence (Chan et al., 2020a; Santibañez-Gutierrez et al., 2022). Research also shows that children may misjudge their own aquatic ability, which reinforces the need for instruction and assessment that distinguish knowledge, perceived competence, and demonstrated performance (Costa et al., 2020). Negative prior experiences can further influence children's progress in learn-to-swim programs (Peden & Franklin, 2020).

At SD Negeri 107430 Galang, practical swimming instruction is constrained by the absence of an on-site pool, distance to suitable facilities, travel risks, limited instructional time, and the availability of accompanying personnel. Consequently, swimming is taught primarily through classroom-based material covering basic freestyle, breaststroke, and backstroke movements; appropriate conduct during swimming activities; and facilities and equipment. Initial observations suggested that students' understanding was uneven, making a systematic description of their knowledge necessary.



Although international studies have examined children's swimming competence and water-safety learning, local descriptive evidence remains useful for planning instruction in schools with restricted access to aquatic facilities. Therefore, this study aimed to determine the level and distribution of fifth-grade students' knowledge of basic swimming movements at SD Negeri 107430 Galang.

Materials and Methods

Study Design

This study used a cross-sectional quantitative descriptive survey. The design was selected to summarize students' knowledge at one point in time without manipulating the learning environment.

Study Participants

The population comprised all 29 fifth-grade students enrolled at SD Negeri 107430 Galang. Because the population was small and accessible, total sampling was used and all 29 students were included. The source manuscript did not report participants' age, sex distribution, previous swimming experience, or formal aquatic training; these characteristics should be documented in future replication studies because they may influence swimming-related knowledge and competence.

Instrument and Data Collection

Knowledge was assessed with a multiple-choice test developed for the study. The initial pool contained 30 items; following item validation, 28 items were retained. The source study reported a reliability coefficient of 0.959. The retained items represented three domains: (1) knowledge of basic swimming styles, (2) appropriate conduct and ethics during swimming instruction, and (3) swimming facilities and equipment. Students completed the test under the researchers' supervision, and correct answers were summed to produce a total score. Because the study measured cognitive knowledge rather than performance in water, the scores should not be interpreted as evidence that a student can swim safely or execute the movements correctly.

Statistical Analysis

Data were analyzed descriptively using frequency, percentage, mean, standard deviation, minimum, and maximum values. The source analysis used SPSS version 20. Scores were classified using the study's norm-referenced cut points: very low ($X \leq 14.92$), low (14.93–18.12), moderate (18.13–21.33), high (21.34–24.53), and very high ($X > 24.53$). Percentages in this revision were recalculated directly from the reported frequencies and sample size ($n = 29$).

Results

The 29 students achieved a mean knowledge score of 19.72 ($SD = 3.26$). The observed scores ranged from 10 to 24 (Table 1).

Table 1. Descriptive statistics for students' knowledge scores

N	Mean	SD	Minimum	Maximum
29	19.72	3.26	10	24

Table 2. Distribution of knowledge categories

Category	Score criterion	Frequency	Percentage	Cumulative %
Very high	$X > 24.53$	0	0.00	0.00
High	21.34–24.53	11	37.93	37.93
Moderate	18.13–21.33	10	34.48	72.41
Low	14.93–18.12	7	24.14	96.55
Very low	$X \leq 14.92$	1	3.45	100.00
Total	—	29	100.00	—

The high category represented the largest single group (11 students; 37.93%), followed closely by the moderate category (10; 34.48%). Seven students (24.14%) were classified as low and one (3.45%) as very low; no student reached the very-high category. In total, 21 students (72.41%) were in the moderate or high categories, whereas eight (27.59%) were in the low or very-low categories. The results therefore indicate a generally favorable but heterogeneous knowledge profile rather than uniformly high mastery.



Discussion

1 The principal finding was that 1 the high category contained the largest proportion of students, while nearly three quarters of the sample fell within the combined moderate-to-high range. This suggests that theory-based instruction at the school has provided many students with a workable cognitive foundation. Nevertheless, 1 the absence of students in the very-high category and the 27.59% classified as low or very low indicate that important gaps remain. The result should therefore be interpreted as a mixed knowledge profile, not as evidence that all students have mastered the content.

The finding is consistent with research showing substantial variation in children's aquatic knowledge and competence. In a large primary-school sample, Santibañez-Gutierrez et al. (2022) found that age, access, previous learning, and socioeconomic factors were associated with swimming competence and water-safety outcomes. Chan et al. (2020a) similarly reported that children's swimming competence was related to participation and learning experiences. These studies support the view that the variation observed at SD Negeri 107430 Galang may reflect unequal exposure to swimming information and opportunities beyond regular classroom instruction.

A crucial interpretive boundary is that the present test assessed declarative knowledge, not actual performance in water. Chan et al. (2020b) developed and validated a multidimensional questionnaire for children's swimming competence, while Sundan et al. (2025) assessed 1 six consecutive aquatic skills among 9–10-year-old pupils and found that 62.5% met the relevant competence standard. Costa et al. (2020) also demonstrated that perceived and real aquatic competence are related but not interchangeable. Accordingly, a student who can identify a correct movement or safety rule on a multiple-choice test may still be unable to execute that action under authentic aquatic conditions. 1

The school's lack of direct access to a pool is pedagogically important. A review by van Duijn et al. (2021) concluded that the task and learning environment influence how children acquire aquatic skills, and that competence should extend beyond reproducing formal strokes. Taylor et al. (2020) likewise emphasized a broad set of aquatic competencies for drowning prevention. Thus, theoretical lessons can introduce movement sequences, equipment, etiquette, and hazard recognition, but they cannot fully replace supervised practice in entry, floating, breath control, propulsion, orientation, and safe exit.

Prior studies nevertheless show that well-designed education can improve learning. Ekanayaka et al. (2021) reported gains in water-safety knowledge, attitudes, and skills following a survival-swimming program, while Invernizzi et al. (2021) showed that applied aquatic pedagogy can improve 1 perceptions of aquatic motor competence. Mekkaoui et al. (2022) highlighted the importance of developmentally appropriate practices for building aquatic literacy, and Minkels et al. (2025) synthesized evidence-based motor-learning approaches for children aged 5–12 years. Together, this evidence suggests that SD Negeri 107430 Galang should move from isolated theoretical delivery toward a sequenced program combining classroom preparation, visual demonstration, scenario-based safety tasks, and periodic supervised aquatic practice through partnerships with accessible facilities.

Instruction should also address affective and contextual barriers. 2 Den and Franklin (2020) found that negative prior aquatic experiences can shape children's learning trajectories. D'Hondt et al. (2021) reported differences among children's actual, self-perceived, and parent-perceived aquatic skills, while Morgado et al. (2023) supported age-appropriate pictorial assessment of perceived water competence. Teachers should therefore avoid assuming that confidence equals competence, identify fear or limited exposure sensitively, and use assessment results to provide differentiated support.

From a practical perspective, the 28-item test may be used as a diagnostic classroom tool, provided 1 that item-level results are reviewed to identify specific misconceptions. Remedial teaching should prioritize the eight students in the low and very-low categories, but enrichment is also needed because no student reached the very-high category. Classroom instruction can include annotated movement sequences, equipment identification, water-safety scenarios, peer explanation, and short formative quizzes. When practical access becomes possible, these activities should be followed by supervised demonstrations and observation-based assessment aligned with aquatic education recommendations (Haga et al., 2025).

This study has several limitations. It involved one school and a small sample, used a cross-sectional descriptive design, and did not report participant characteristics or item-level/domain-level scores. The instrument's reported reliability was strong, but the source manuscript did not provide the validation sample, validity coefficients, item difficulty, discrimination indices, or full scoring procedure. Most importantly, the test measured knowledge only. Future studies should combine validated cognitive measures with direct assessment of aquatic competence, document prior experience and facility access, and evaluate whether a structured instructional intervention improves both knowledge and performance.



Conclusions

Fifth-grade students at SD Negeri 107430 Galang showed a generally favorable but uneven level of knowledge about basic swimming movements. Of the 29 students, 37.93% were in the high category, 34.48% were moderate, 24.14% were low, 3.45% were very low, and none were very high. The findings support continued theoretical instruction but also reveal the need for targeted remediation and safe opportunities to connect knowledge with practice. Schools facing facility constraints should develop partnerships for supervised aquatic learning and should assess knowledge, perceived competence, and actual water competence as distinct outcomes.

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Author Contributions

Y.H.P.: conceptualization, methodology, data collection, project coordination, and original draft preparation. E.A.: data analysis, interpretation, review, and editing. Both authors approved the final manuscript and accept responsibility for the integrity of the work.

Conflict of Interest

The authors declare no conflict of interest.

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