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Enhancing Students' Swimming Performance through PARE-SON Intervention Program

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ABSTRACT:

Swimming is an integral component of the Physical Education curriculum. This paper aims to address the challenges students face in swimming and enhance the methods of teaching swimming lessons in Physical Education class by implementing PARE-SON intervention program. Employing a quantitative, quasi-experimental research design, this study utilized pre-test and post-test approach to collect data from the swimming performances of 45 Grade 12 learners of St. John Berchmans High School Incorporated, selected through purposive sampling technique. The findings revealed that (1) the intervention program was effective, as evidenced by pre-test and post-test mean results of 1.76 (fair) and 3.51 (excellent), respectively; (2) there is a statistically significant difference of learners' swimming performances during the pre-test and post-test phases; and (3) a Cohen's d result of 1.933 indicates a large effect size, reflecting a substantial effect on the learners' swimming performances. These findings invite reflection and encourage future researchers with similar objectives to adapt or adopt the PARE-SON intervention program for further investigation in broader context and various learning areas regarding its effectiveness.

Keywords: PARE-SON, Physical Education, Swimming Lessons, Academic Performance, Quasi-Experimental.

I. INTRODUCTION

Physical Education (PE) is one of the subjects taken by the Senior High School students. In this subject, it helps learners to realize the potential of developing their holistic aspects. It also provides the learners to enhance their physical well-being and elevating their skills in terms of confidence, resilience, and teamwork. PE is a way of helping the learners to understand their full potentials by showcasing their skills and talents by maintaining their physical fitness while enjoying ("Read 'Educating the Student Body: Taking Physical Activity and Physical Education to School' at NAP.edu," n.d.) through diverse activities from team sports and individual exercises to indigenous games (Physical Education (PE) in Schools and Its Importance, 2024). Furthermore, aside from honing students' skills and talents, some studies assumed that this subject assists the learners to eliminate their stress from the more serious academic-centered subjects. For instance, according to Cimene, et al. (2020), PE subjects provide positive stress to students while doing physical activities because they bond with their friends and laugh with them, making the said subject a great potential in enhancing the physical health, emotional and social well-being of the learners.

In addition, O'Connor (2021) stated that for having a good mental health, physical activity plays a critical role such as reducing anxiety, stress, depression and increasing self-esteem. Then, PE increases student physical health and better academic performance (Owis Communications Team, 2020).

Speaking of academic performance, despite the said ideal evidence stated above, there are students, especially those grade-oriented, who take this subject not for enjoyment but for academic purposes only because they view it as another academic requirement that they must be passed. This may contribute to the frustrations of the students specifically when they were not able to grasp the concepts and need to perform the concepts that affects their academic performance. With this, students perceive PE from a subject of enjoyment into an academic hurdle (Calunsag & San Diego, 2023).

This underscore the need for a teacher to create a teaching intervention to teach the PE concepts so that students could able to perform. In the context of St. John Berchmans High School Incorporated, specifically in Senior High School, among the diverse lessons, there is lesson integrated in the PE curriculum that students may find it as challenging.

This mentioned lesson is Swimming. This lesson holds unique challenges and difficulties in which students must overcome to meet the academic requirements of the subject. Furthermore, this lesson requires students to go beyond with grasping the concepts because they need to perform such as the various technique strokes and master the breathing rhythms (Breathing Techniques for Swimming | Big Blue Swim School, 2024). These ideas add to those students who have less exposure to the aquatic environments and with low tuned coordination and cardiovascular stamina.

Consequently, novice student-swimmers tend to lessen their confidence in performing swimming lessons that adversely affect their academic performance. That is why, recent studies accentuated the necessity to re-assess the traditional swimming instruction and transform into more learner-centered approaches (Minkels et al., 2025; An & Mindrila, 2020). Therefore, this paper proposed and assessed the effectivity of the intervention created by the researchers. This intervention aims to appreciate swimming lessons and helps students to grasp the swimming lessons so that they can perform well that may affect their academic performance.

1.1. Objectives of the Study

Students were having a difficult time in passing swimming lesson due to its complex concepts that are challenging to perform and apply in the aquatic environment in which it affects their academic performance in Physical Education subject. This paper is aimed to enhance the method of teaching swimming lessons in Physical Education subject utilizing an intervention program.

Specifically, this research worked on the following specific objectives:

1. Compare the mean results of swimming lessons' academic performance before and after an intervention program;
2. Assess whether there is a significant difference in students' swimming lessons' academic performance between the pre-intervention and post-intervention program; and
3. Evaluate the extent of the impact of the intervention program in students' swimming lesson' academic performance.

1.2 Theoretical Framework

This study is aligned with the theory of Cognitive Apprenticeship developed by Collins, Brown, and Newman and introduced in 1989 (Instructional_design:cognitive_apprenticeship [Learning Theories], 2023).

According to this theory, integration of social and experiential learning aspects is a founding ingredient that makes it comprehensive framework and aligns to this study. Moreover, this theory emphasizes that the role of the teacher, after demonstrating the concepts, is a facilitator that guides the students in grasping the swimming lessons to applying what they have learned from the lessons through series of performance tasks. That is, it offers an experiential learning context where traditional and teacher-centered methodologies merged with situated, practice-based strategies—more on guided experiences in authentic environments.

Hence, this study, specifically the intervention program, aligns well with its principal components. The diagnostic tool that is in a form of pre-assessment benefits students to recognize their prior knowledge and informing the necessary instructional modifications through feedbacking.

The modeling stage of the theory is corresponded to the lecturing and demonstration phases of the intervention program. In these said phases, the students will be observing the teacher's performance and acquire procedural information.

Furthermore, the buddy system in which the students will be paired to other students fosters coaching and scaffolding. After all, under this phase of the intervention program, the two students allow to support each other and assist themselves to bridge the gap between their current skills and mastery. In this phase, the students are given opportunity to do experiment through active exploration with the novel introduced skills, and refine their comprehension through series of practice.

The ultimate phase is the post-assessment that helps students to perform the given swimming lesson task, reflecting, and evaluating their progress.

Indeed, to ensure that the intervention program is learner-centered, Cognitive Apprenticeship is a support theory that guides the intervention program conceptually and practically. This theory unites the traditional way of teaching with hands-on, socially collaborative learning strategies that offers a robust structure both learners' learning diversity and adaptive support-based learners' academic performance assessments. Lastly, by aligning modelling (lecturing and demonstration), buddy system (pair, teach, and share), pre-assessment, trial and error, and post-assessment strategies within this theory, the intervention provides comprehensive, engaging, and effective students' learning experience.

II. RESEARCH METHODOLOGY

This paper employed a quantitative with quasi-experimental research design to measure the effect of the intervention program on students' swimming performance.

Using a purposive sampling technique, the researchers selected one section of Grade 12 students who took Accountancy, Business, and Management strand and had a Physical Education subject with swimming lesson integration. The data were collected using pre-test and post-test approach among the 45 students.

However, before administering the intervention program, the researchers secured permission from the Senior High School Academic coordinator through an approval letter. After securing the permission, they went to their target participants and explain the advantages of the intervention program before asking them to participate using authorization letter that states there that they voluntarily participate in the program. It was explained that all data gathered were solely for research purposes only.

Since this study used pre-test and post-test approach, the data collection methods begin with pre-test where it is the considered as the pre-intervention phase (Baseline Assessment). After that, intervention proper in which the researchers implemented the intervention program. Lastly, post-test that considered as the post-intervention program (Outcome Measurement) to assess the improvements of students' swimming performance.

After collecting the data, they were statistically analyzed using descriptive statistics such as Mean and Standard Deviation to compare the results of pre-intervention and post-intervention, Paired-Sample T-test to assess the statistically significant difference of pre-intervention and post-intervention; and effect size analysis like Cohen's d to quantify the strength of the intervention's effect.

2.1. Intervention Program

The Pre-assessment, Active Lecturing, Responsive Demonstration, Experiential Buddy Pairing, Systematic Trial and Error, and Outcome-oriented Notable Post-assessment (PARE-SON) intervention program is aimed to enhance swimming instruction in Physical Education.

This acronym PARE-SON is derived from the idea of ”Pares,” a Filipino term, which means “by pair” because the essence of this intervention is help learners who are needing assistance to be pair of those learners who actively grasp the swimming concepts and there, they will undergo the PARE-SON intervention program.

Since the intervention program is aligned with the Cognitive Apprenticeship Theory, some of the idea of it were adapted in the plan. Hence, the table below shows the intervention program plan and how does it work:

Table 1. PARE-SON Intervention Program Overall Plan

Phases	Plans
Pre-Assessment	**The teacher will diagnose the students with the following concepts of swimming by letting them perform in the aquatic environment. Using a rubric, the teacher will pre-assess the students and give feedback afterwards.** **The data gathered in this phase will be essential in determining how to teach the lesson. Also, the data will be used as a baseline assessment under pre-intervention program.**
Lecturing and Demonstration	**The teacher will discuss the concept of a certain lesson in the swimming lesson. After that, he will demonstrate how by performing the concept in the aquatic environment and let the students follow or imitate it. This allows the teacher to deliver dynamic, clear instruction swimming techniques to involve students and introduce the fundamental concepts.** **In the latter step, the teacher will determine students who grasp the lesson and can perform well initially and these students will be paired to another students who are struggling with the lesson.** **It is important to note that the teacher should give instruction clearly and understandable on what the students need to be done.**
Experiential Buddy Pairing and Trial and Error	**After the teacher partnered the students, they will teach one another to bridge the gap between their present knowledge and mastery. This may include trial and error by actively experimenting how to do it and finding ways on how to make grasping with a good performance in an easy manner. This requires the students to actively involve themselves with this stage to make the learning more meaningful.** **The role of the teacher in this phase is a facilitator who guides the students and when questions arise, the teacher will use Socratic Method. This role of the teacher is adapted from Perez and Gapasin (2025) intervention program called “RE-COUNTING.”** **In this phase, the students will be given opportunities to experiment techniques, learn from their mistakes, and refine their skills.**
Post-Assessment	**After the given time, the teacher will gather all students for the post-assessment. The gathered data in this phase will be an essential tool for determining whether the intervention program is effective because the Post-Assessment results will be compared to the Pre-Assessment results.** **It is important to note that feedbacking is still be given to the students for their further improvement to be used in the next swimming lesson.**

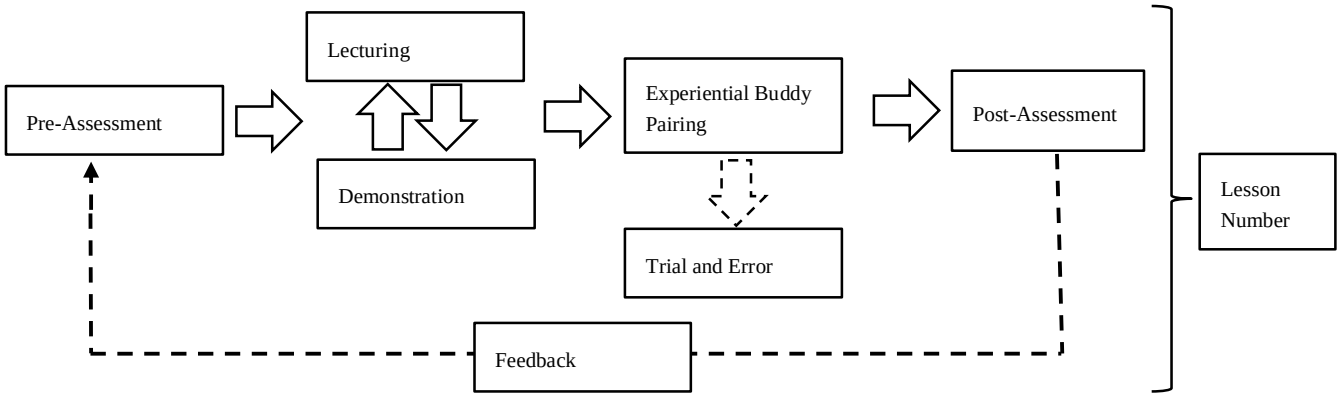
The plan above is suitable for one hour. This is exact for the Physical Education subject. This means that every lesson in swimming, the teacher will use this intervention plan. Therefore, the table below presents the ideal time allocation and specific objectives in each phase.

Table 2. PARE-SON Intervention Program Objectives and Time Allocation

Phases	Time Allocation	Objectives
Pre-Assessment	**10 minutes**	**To diagnose students with their present swimming skills using criteria; and** **To provide immediate and formative feedback based on students’ initial performance.**
Lecturing and Demonstration	**15 minutes**	**To discuss and present swimming concepts;** **To demonstrate swimming concepts in an aquatic environment; and** **To identify students who grasp the lesson well for later pairing**
Experiential Buddy Pairing and Trial and Error	**20 minutes**	**To pair students to actively practice, experiment methods, and learn through trial and error;and** **To facilitate students using learner-centered approach and Socratic method.**
Post-Assessment	**15 minutes**	**To re-assess students’ performance;** **To compare the results with the baseline; and** **To give feedback to students for the areas that they need to enhance.**

Furthermore, the following figure illustrates the cycle of the intervention program:

Figure 1. PARE-SON Intervention Program Cycle



Lastly, it is important to note that Physical Education subject in Senior High School has one meeting (one hour) only in a week. Hence, the table below shows the swimming lessons discussed by the researchers with their allocated week number.

Table 3. Swimming Lessons with Allocated Week Number

Swimming Lessons	Activity	Week Allocation
Breathing	**The students will demonstrate getting oxygen surface and blow under the water.**	**1**
Floating (Supine, Prone, and Buoyancy Position)	**The students will apply various floating positions to be applied in free style and backstroke.**	**2**
Paddling	**The students will apply all the swimming stroke except for breast stroke.**	**3**
Free Style **Back Stroke** **Side Stroke**	**The students will demonstrate proper body alignment, paddling, breathing, and crawling—Supine (Back stroke), Prone (Free Style), and Side Stroke.**	**4-6**
Breast Stroke **Butterfly Stroke**	**The students will perform proper body alignment, breathing, hand crawling, and kicking.**	**7-8**

The swimming lessons indicated above are allocated for one semester for the students to build their mastery and confidence in the aquatic environment.

III. RESULTS AND DISCUSSION

After the data were collected and deliberated to the learners, they were systematically analyzed, scrutinized, and interpreted. Hence, the results were meticulously presented in a tabular format.

1. Learners' Swimming Performances' Pre-Test and Post-Test Results

Table 4. Mean and Standard Deviation Results of Participants' Pre-Test and Post-Test Scores in Swimming Performances

Phases	Standard Deviation	Mean	Description	Mean Difference
Post-Test	**0.506**	**3.51**	**Excellent**	**1.75**
Pre-Test	**0.609**	**1.76**	**Fair**	

Legend:

Mean Range	Interpretation
3.26 – 4.00	**Excellent**
2.51 – 3.25	**Good**
1.76 – 2.50	**Fair**
1.00 – 1.75	**Poor**

Table 4 shows the mean and standard deviation results of pre-test and post-test results of participants' swimming performances.

Based on the table, it revealed that the participants performed well during the post-test with 3.51 mean scores (Excellent) compared to pre-test with 1.76 (Fair). This is evidenced of the yielded mean difference scores with 1.75, indicating drastic and meaningful improvements of learners' swimming performances. These findings underscore the effectiveness of PARE-SON intervention in the learners' Physical Education subject, specifically in teaching swimming concepts.

In addition, the standard deviation results between pre-test and post-test presented tighter results. This indicates that the entire group enhance their performance consistently, marking another evidence that the intervention program is effective.

Based on the findings, the intervention elevated average performance and reduced disparities among students that hint at an instructional methodology, which accentuated individualized feedback, consistent practice, and novel teaching framework.

2. Significant Difference between Learners' Swimming Performances' Pre-Test and Post-Test Results

Table 5. Paired-Sample T-Test Results of Participants' Pre-Test and Post-Test Scores in Swimming Performances

Phases	t-value	p-value	Remarks	Decision
Post-test and Pre-test	**12.964**	**< 0.001**	**Significant**	**Reject H_0**

***Significant level at 0.05**

The paired-sample t-test results in Table 5 indicate a highly significant difference between the participants' pre-test and post-test scores in swimming performance.

This is evidenced showed on the table where the t-value result is 12.694 and the p-value result is <0.001. This yielded significant data strongly supports the rejection of the null hypothesis, indicating that there is a significant difference between the learners' swimming performances' pre-test and post-test results.

The significant outcome yielded on Table 5 confirm that the intervention program had a measurable and positive effect on swimming performance, which upscaled the average performance while concurrently reduced capriciousness among the learners. Furthermore, the t-value results suggest that the enhancements are robust and not attributable to probability, highlighting the strategies effectiveness like personalized feedback, consistent practice, and innovative teaching methods utilized during the intervention.

Indeed, these findings aligned with established research in performance improvement that reinforced the notion that targeted instructional practices could produce extensive and reliable improvements in learners' skills.

3. Effect Size Analysis of Learners' Swimming Performances Improvement

Table 6. Cohen's d and Effect Size Analysis for Learners' Swimming Performances Development

Phases	Standardizer	Cohen's d	Effect Size
Post-test and Pre-test	**0.908**	**1.933**	**Large**

Legend:

Cohen's d Range	Effect size
$0.2 \leq d < 0.5$	**Small**
$0.5 \leq d < 0.8$	**Medium**
$d \geq 0.8$	**Large**
-d	**Directional Indicator**

Table 6 offers compelling snapshot of the effect that an intervention program had on the swimming performances of the learners by comparing pre-test and post-test data through effect size analysis.

The table shows the standardizer result of 0.908 that represents the pooled standard deviation across the two testing phases. The results indicate that, on average, there is variation of the scores by approximately 0.908 units from the mean. This could be a critical benchmark, which establishes the context for measuring differences. This means that any observed enhancement in the swimming performance is standardized relative to this inherent variability of the data.

Moreover, Cohen's d results with 1.933 which is considered as high and has large effect remark that is greater than the usual educational and behavioral studies. With this value, it suggests that the learners' improvement is almost two standard deviations above the pre-test performance, which signifies a drastic and statistically robust improvement in swimming skills.

With these mentioned findings, it emphasizes that the instructional methodologies used in the PARE-SON intervention program were not only effective but also meaningful and practical in real-world terms. These improvements suggest that the approach could be potentially serve as a model for similar educational or physical training intervention, where the goal is the same as the objective of this paper.

Also, the findings of Table 6 are aligned with the claims and findings of Tables 4 and 5 in which that PARE-SON intervention program shows practical, statistical and notable improvements among learners' swimming performances.

Overall, the table findings underscore that the intervention used in this study met statistical threshold and achieved the level of practical significance that could educate future research and practice in Physical Education. However, the dramatic improvement of learners in their swimming performances invites reflections to call for further investigation—recommending that the intervention may adapt or adopt by the future researchers with similar or close to the intervention or paper objectives.

Indeed, exploring further the effectiveness of this intervention in various context and subject areas to provide deeper insights is highly recommended. After all, Gapasin (2025) stated that in educational context today, one of the principal stepping stones to honing globally competitive students is adopting effective instructional methodologies—approaches that produce a unique and specialized intervention program premeditated to address students' needs—that can be practical both inside and outside the classroom.

IV. CONCLUSIONS

This paper aims to address the challenges students face in Physical Education that appears to adversely affect their academic performance by implementing PARE-SON intervention program.

Hence, in the lights of the findings, the following conclusions were drawn:

PARE-SON intervention program was found to be effective in improving learners' swimming performances as evidenced in the mean and standard deviation results of pre-test and post-test with 1.76 (fair) and 3.51 (excellent), correspondingly, and has a mean difference of 1.75;

The correlational table findings revealed there is statistically significant difference between the learners' swimming performance during pre-test and post-test with 12.964 for t-value and <0.001 for p-value; and

The effect size of the intervention program among the learners, specifically on their swimming performances, remarked as "large" based on the Cohen's d's result of 1.933. This clearly means that the intervention program had substantial impact on the learners' performances in swimming.

V. IMPLICATIONS TO THEORY AND PRACTICE

The remarkable achievement of **P**re-assessment, **A**ctive Lecturing, **R**esponsive Demonstration, **E**xperiential Buddy Pairing, **S**ystematic Trial and Error, and **O**utcome-oriented **N**otable Post-assessment (**PARE-SON**) intervention program reinforces the Cognitive Apprenticeship theory. This emphasizes the guided learning experience, modelling, scaffolded learning, and gradual release of responsibility.

Furthermore, the impactful improvements in swimming performance of the students confirm that they are supported through this cognitive and practical approaches. They can effectively shift from dependent and assisted to independent performance. Truly, this findings support spreading the Cognitive Apprenticeship theory application to teaching Physical Education.

Also, the results suggest that expert modelling, coaching, and scaffolding practice—strategies from the Cognitive Apprenticeship can critically affect the enhancement of learners' skills not only in Physical Education-related subjects but to the other learning areas. This can be happened due to the flexibility of the intervention program, which this paper recommended for the future researchers with similar objectives of this paper to adapt or adopt to further investigate the extent of its effectiveness.

In addition, despite the compelling results of the intervention program, educators could leverage the given techniques to design more effective intervention programs, providing enhanced performance and increased student autonomy, thereby positively affecting overall academic performance.

Acknowledgment

PARE-SON is an idea derived from the word "Pares," a Filipino term, which means "by pair" because the essence of this intervention is help learners who are needing assistance to be pair of those learners who actively grasp the swimming concepts and there, they will undergo the PARE-SON intervention program.

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