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Integrating project-based learning and inclusive teaching style: an innovation to improve freestyle swimming skill

Abstract

This study aims to examine the effect of the integration of the project-based learning (PjBL) model and the inclusive teaching style on freestyle swimming skills. This research is an experiment with a nonequivalent control group design. A total of 73 students were involved in the study and were divided into two groups, namely the experimental group and the control group. The experimental group was given a learning treatment using the integration of the PjBL teaching model and an inclusive teaching style, while the control group used traditional learning or Direct Instruction (DI). The intervention was carried out for eight weeks with face-to-face meetings between lecturers and students once a week according to the lecture schedule. Both experimental and control groups received 100 minutes of face-to-face teaching, 120 minutes of independent assignments, and 120 minutes of structured assignments. There are two instruments used to measure freestyle swimming skills, namely the 50-meter-freestyle swim test and the observation sheet of the

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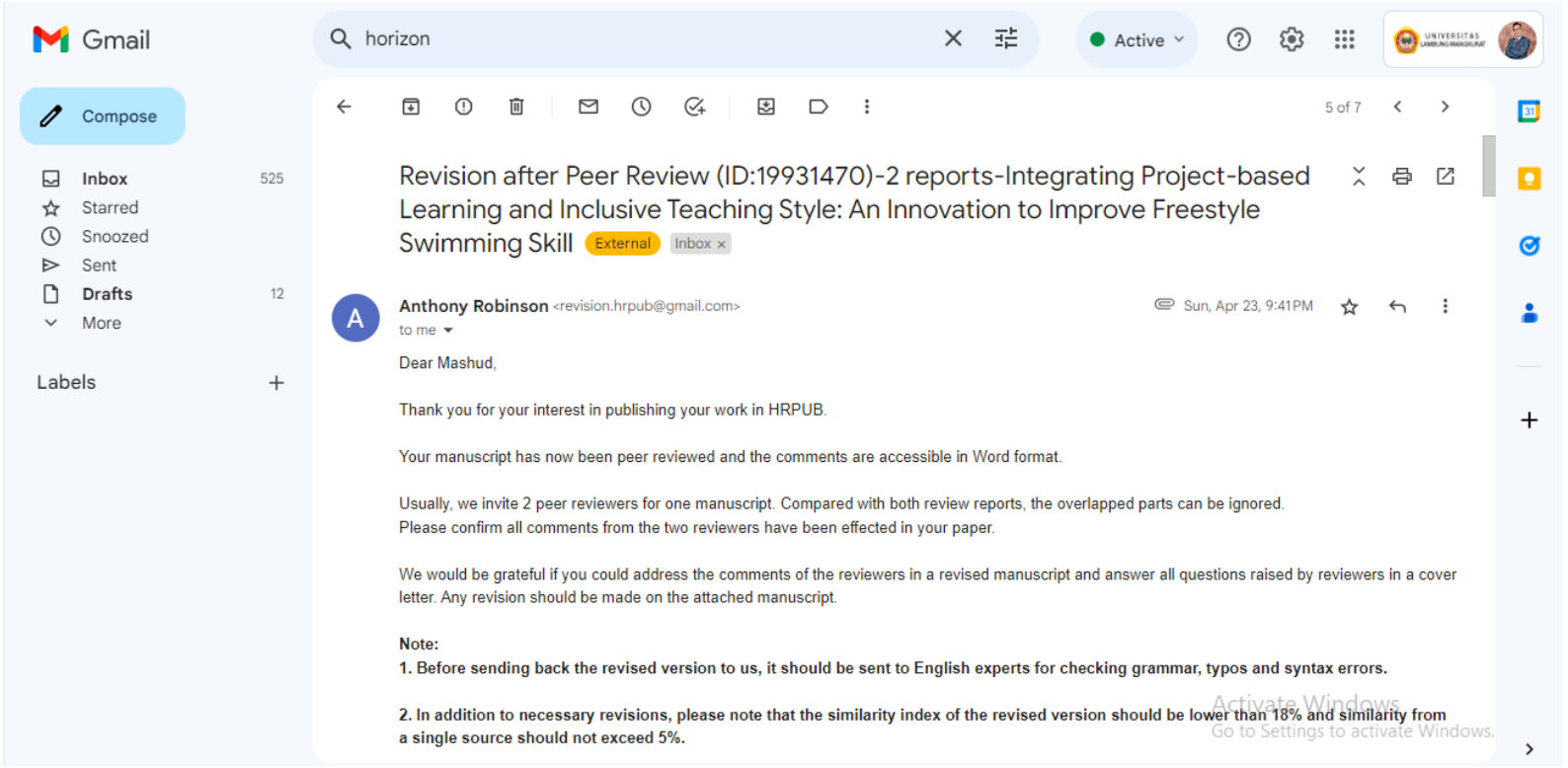
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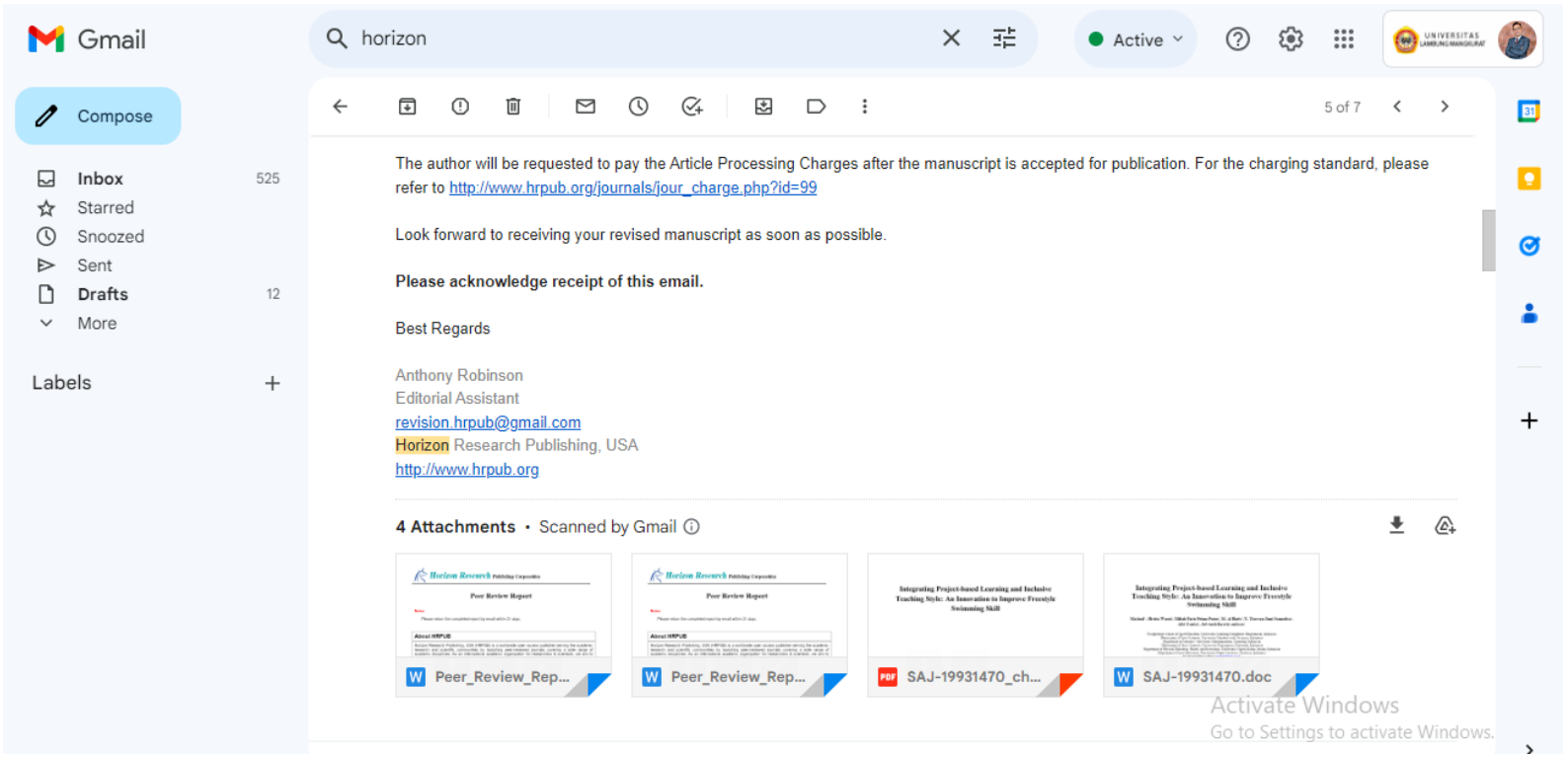
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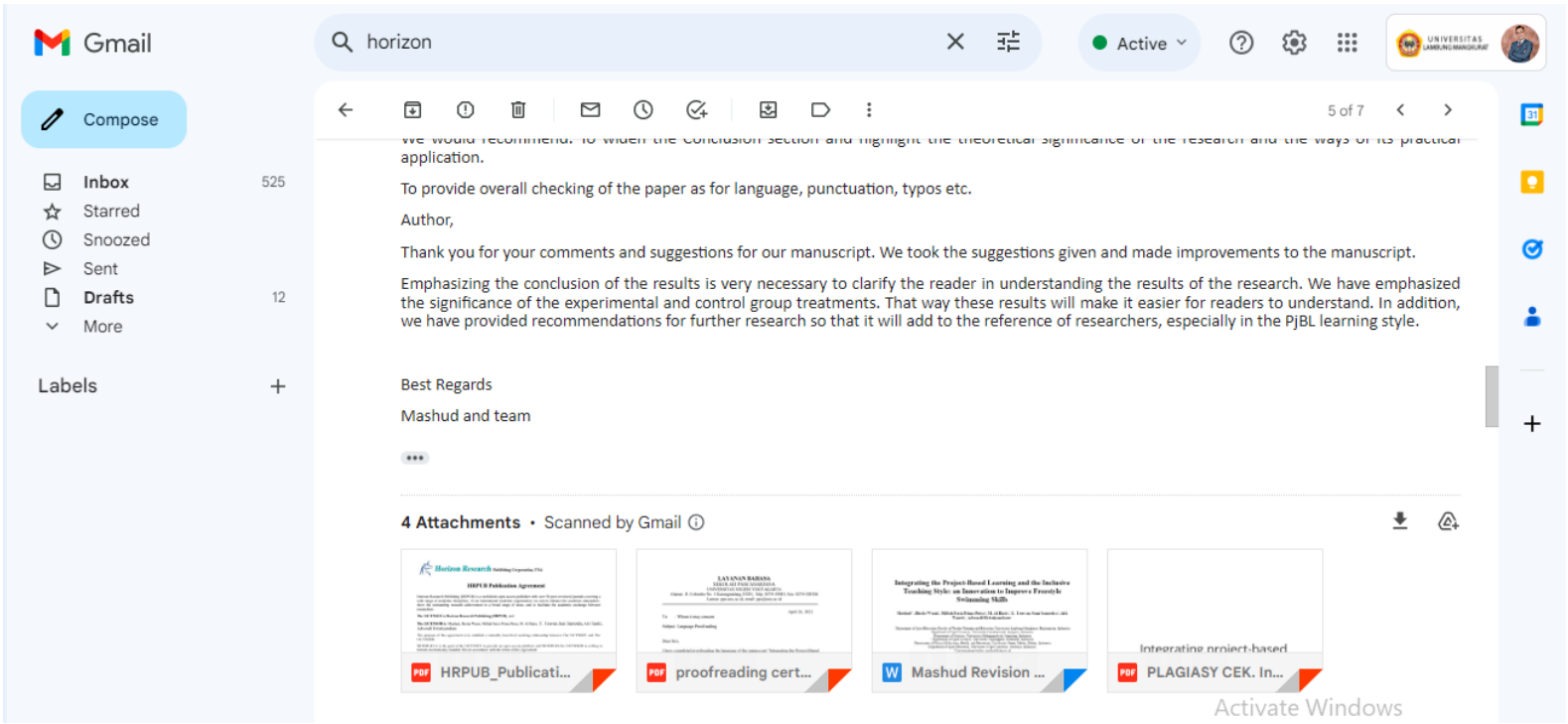
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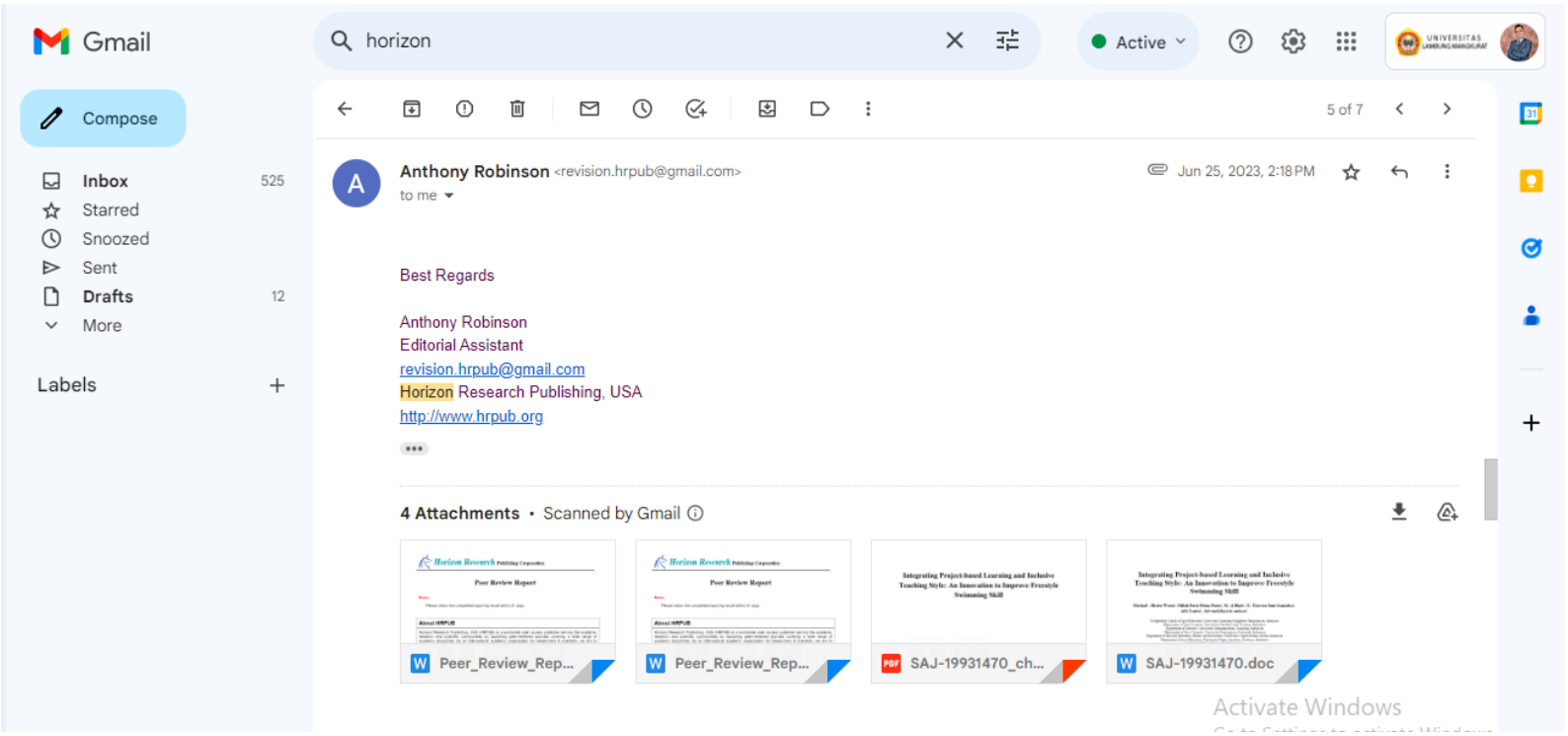
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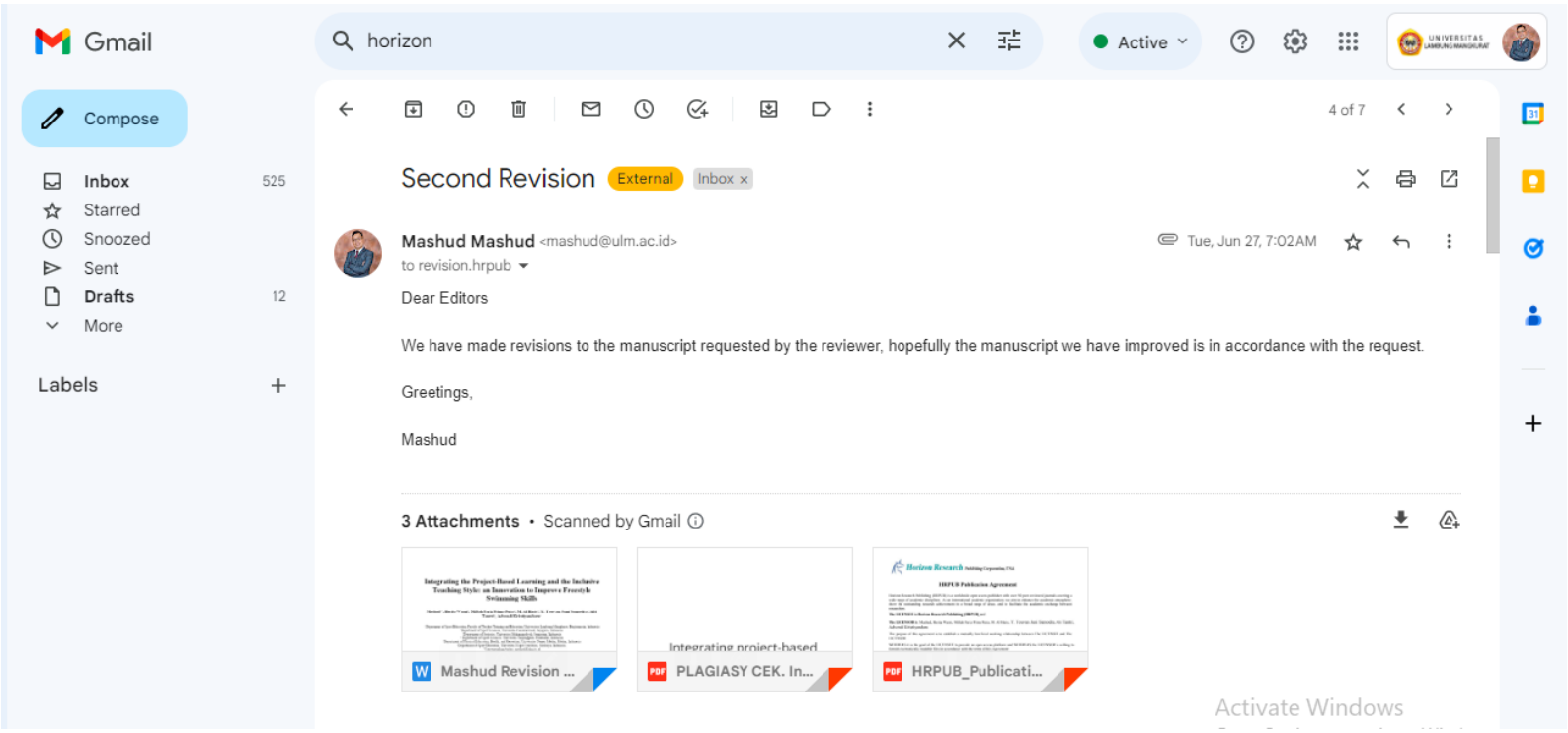
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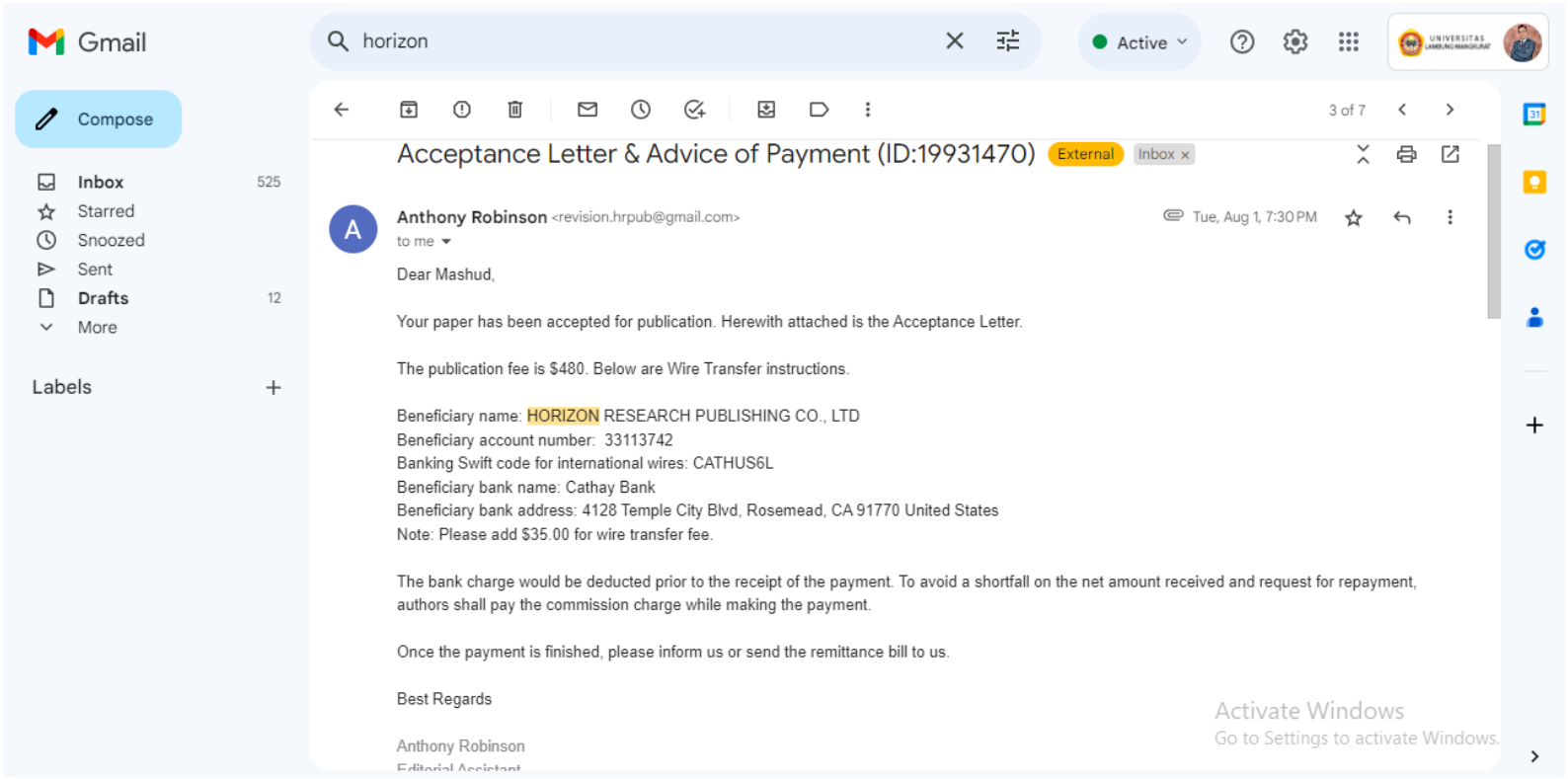
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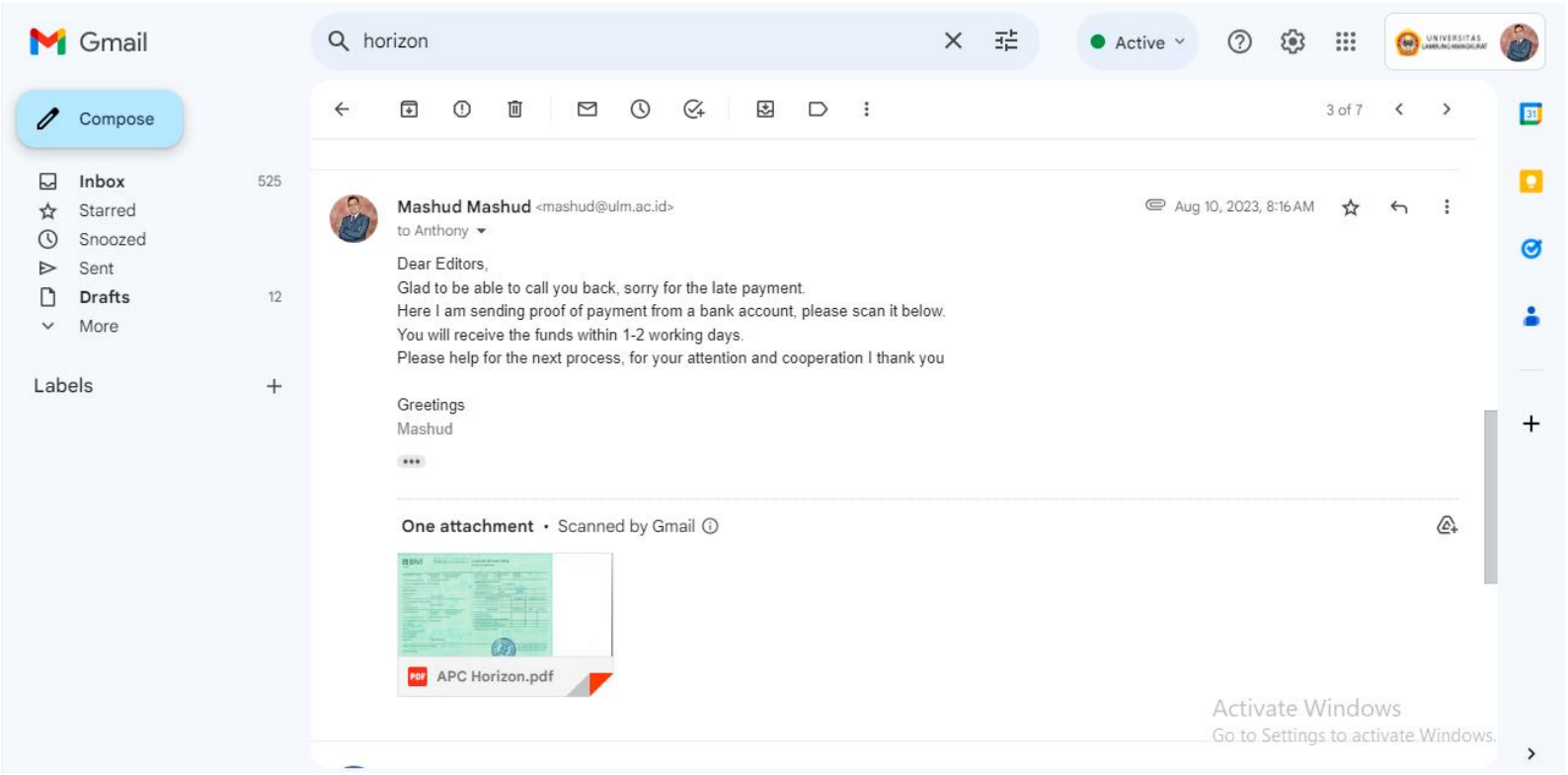
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Keywords
freestyle swimming skills, inclusive teaching style, project-based learning model

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Integrating project-based learning and inclusive teaching style: an innovation to improve freestyle swimming skill

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Abstract This study aims to examine the effect of the integration of the project-based learning (PjBL) model and the inclusive teaching style on freestyle swimming skills. This research is an experiment with a nonequivalent control group design. A total of 73 students were involved in the study and were divided into two groups, namely the experimental group and the control group. The experimental group was given a learning treatment using the integration of the PjBL teaching model and an inclusive teaching style, while the control group used traditional learning or Direct Instruction (DI). The intervention was carried out for eight weeks with face-to-face meetings between lecturers and students once a week according to the lecture schedule. Both experimental and control groups received 100 minutes of face-to-face teaching, 120 minutes of independent assignments, and 120 minutes of structured assignments. There are two instruments used to measure freestyle swimming skills, namely the 50-meter-freestyle swim test and the observation sheet of the experimental process. Descriptive analysis, data requirements tests, and t-tests were used to analyze research data. The findings of the study show that teaching by using the PjBL and inclusive teaching models as well as teaching by using traditional methods (DI) both have a positive effect and can improve students' freestyle swimming skills ($p < 0.05$). Even so, there is a significant difference between the experimental and control groups as evidenced by the Z-value of -5.275 and the Sig. 0.000 ($p < 0.05$). The experimental group that was taught by using the integration of the PjBL and inclusive teaching models appeared to have higher learning outcomes.

Keywords: *Freestyle Swimming Skills, Inclusive Teaching Style, Project-Based Learning Model*

1. Introduction

Based on my ten-year experience of teaching freestyle swimming, teaching freestyle swimming can be described as follows. (1) Students' independence in learning or practicing is still low. Studying is done for only 100 minutes (two hours of lectures), that is, when the lecture is in progress. (2) Students do not yet understand how to learn or practice effectively, namely in accordance with the characteristics of their own abilities. Learning or exercises carried out by students tend to imitate what is seen and done by teachers or other students. Students do not understand what material is suitable and safe for their safety. (3) The time the students spend on participation in learning or practicing every week is limited. (4) The learning process in courses does not involve the full role of students in solving their own learning problems, so the learning process during one semester is less meaningful and does not bring results according to the expectations of learning objectives.

With the problem of teaching freestyle swimming above, we have reviewed various alternative solutions from learning the findings of the research related to the effectiveness of teaching freestyle swimming. We explored international scientific reference search engines such as ScienceDirect, DOAJ, EBSCO, and a national scientific publication search engine called “Garba Reference Digital (Garuda)” using the keywords “effectiveness of freestyle swimming teaching,” “freestyle swimming training,” and "teaching freestyle swimming" from 2015 to 2022 received two major research themes, namely (1)

research related to improving freestyle swimming skills using teaching or training models or methods (see for example [1], [2], and(2) research on improving swimming skills by applying various teaching media (see for example [3],[4],[5],[6]. Even so, when we analyzed more deeply, we did not find any alternative solutions related to the problems we encountered in the field.

The research above tends to produce findings that have a single impact, namely on the hard skill aspect, while the soft skill aspect has not been touched. In fact, soft skills such as independence, discipline, responsibility, and toughness to continue learning are important foundations for students in the future. Based on this, arises the question of how to teach freestyle swimming skills that are able to make students independent and understand what is learned according to their abilities.

We are of the view that a teaching innovation is needed to answer the questions above in addition to solving the problems we encounter in the field. Integrating the project-based learning (PjBL) model with an inclusive teaching style, which we value, can be an alternative solution and innovation in the teaching of freestyle swimming. The PjBL teaching model is a teaching pattern that educates students to obtain learning objectives by being directly involved in the stages of learning by doing assignments in a scheduled and controlled manner in the form of completing teaching products [7]. This means PjBL is not learning what is told and is fixated on procedures and instructions from teachers; so the active role of teaching shifts from teachers to students. Teachers only act as facilitators and motivators in the teaching-learning process. The advantage of the PjBL teaching model in teaching is that it provides students with opportunities to solve their own learning problems by communicating and collaborating with friends in their groups. In the long run, the PjBL teaching model will make students trained and educated independently to be able to learn to realize their learning goals. Studies that test PjBL tend to find positive results in relation to student learning outcomes [8][9]12].

In contrast to PjBL, the inclusive teaching style is the teaching that refers to the theory of Mosston & Ashworth [11]. In theory, they explain that inclusive teaching is teaching that presents a variety of materials in the form of various difficulties for students. Inclusive teaching aims to facilitate a wide variety of student competency characteristics, so that in learning, students can determine the level of difficulty in their learning [12]. Studies that examine inclusive teaching styles tend to find positive results when associated with aspects of student learning and psychological outcomes (see for example [13],[14],[15].

With this understanding, we are of the view that integrating the PjBL teaching model with an inclusive teaching style can be a solutive innovation in improving students' freestyle swimming skills. The use of these two models in one unit will complement each other and perfect the stages of the teaching process. The PjBL teaching model highlights learning achievement products accompanied by a schedule for the achievement of learning outcomes, while the inclusive teaching style highlights the diversity of learning material difficulties accompanied by the freedom of students to choose their load and learning method. Thus, the integration of the two models is expected to improve not only hard skills (increased learning outcomes) but also soft skills (creative attitude, independent learning, motivation, and self-confidence). Schematically, the integration of the PjBL teaching model and the inclusive teaching style is presented in Table 1 below.

Table 1. Integrating PjBL teaching model with inclusive teaching style

Project-Based Learning Model [7]	**Inclusive Teaching Style** [14,19]	**Innovation Model**
Determining basic questions	Diagnostic Assessment	Diagnostic Assessment
Designing product planning	Determining teaching objectives	Determining objectives and designing product planning
Arranging product-making schedule	Designing various teaching material difficulties	Designing various teaching material difficulties
Monitoring project activeness and development	Demonstrating and teaching practice	Arranging product-making schedule
Testing the result	Teaching process feedback	Practicing and monitoring project development
Learning experience evaluation	Teaching result feedback	Teaching process feedback
		Learning experience evaluation

Until now, the integration of the two models (PjBl and inclusive teaching models) has never been carried out by scientists. Therefore, this study will be a pioneer in integrating the two teaching models used in overcoming problems in the teaching of swimming. For this reason, the aim of this study is to examine the effect of the integration of the PjBL and inclusive teaching

models on freestyle swimming skills.

2. Materials and Method

2.1. Ethical Clearance

The protocol of the study was approved by the Health Research Ethics Committee with the number 145/KEPK/2022. Information about the study was explained to the students; objectives, data collection steps, timing of research study, and benefits of participation in the research project were given to the students. All respondents were requested to provide the written informed consent before participating in this study.

2.2. Research Design

This type of research used to examine the effect of the integration of the PjBL and inclusive teaching models on freestyle swimming skills is a quasi-experiment with a nonequivalent control group design. With this design, there are two groups in this study, namely the experimental group and the control group [17]. In the experimental design, this design is seen as a better design because there is a comparison group and there is a pretest and posttest [21,22].

2.3. Participants

The research participants are students of the Physical Education Study Program, Faculty of Teacher Training and Education, Lambung Mangkurat University, Banjarmasin, South Kalimantan, Indonesia. The criteria for participants in this study are (1) students who program aquatic basics courses in even semesters, and (2) students who are physically and mentally healthy. Based on these criteria, three classes with a total of 120 students become the subjects of this research. To determine the experimental group and the control group, we did not randomize individuals but we randomized groups. The group random technique is used if the characteristics of each existing class (three classes) are not much different [19]. Based on this, one class with 37 students was established as the experimental group and one class with 36 students as the control group, thus totaling 73 students. Of the 73 students, 57 are males and 16 are females. Their age ranges from 19 to 20 years.

2.4. Experimental Procedures

Our research procedure is divided into three stages, namely (1) the pre-test or diagnostic test stage, (2) the treatment stage, and (3) the post-test stage. At the pre-test or diagnostic test stage, all students who are the study sample underwent a pre-test in 50-meter freestyle swimming skills. The result of this pre-test was used as comparative data after the research series was completed.

At the second stage, namely giving treatment, we tested the PjBL teaching model with an inclusive teaching style. The experimental group was given a learning treatment using the integration of PjBL and inclusion teaching models. The following are the stages of the procedure used in this study: (1) diagnostic assessment, (2) determining goals and designing product plans, (3) designing a variety of learning material difficulties, (4) arranging product-making schedules, (5) practicing and monitoring project development, (6) feedback on the teaching process, and (7) evaluation of learning experiences. In terms of difficulty levels, we divide learning materials into six levels as presented in Table 2.

Table 2. Difficulty Level of Swimming Practice

No	Swimming Difficulty Level	Materials
1	Level 1 Difficulty	Swimming at a depth of 75 centimeters with a distance of 25 meters, using a float
2	Level 2 Difficulty	Swimming at a depth of 75 centimeters with a distance of 25 meters, without a float
3	Level 3 Difficulty	Swimming at a depth of 100 centimeters with a distance of 25 meters, using a float
4	Level 4 Difficulty	Swimming at a depth of 100 centimeters with a distance of 25 meters, without a float
5	Level 5 Difficulty	Swimming at a depth of 150 centimeters with a distance of 25 meters
6	Level 6 Difficulty	Swimming at a depth of 200 centimeters with a distance of 50 meters

The control group was taught by using the traditional learning method that has been used in teaching swimming so far,

namely the Direct Instruction (DI). The teaching by using the DI model was carried out by following the teaching syntax including 1) conveying goals and motivating students, 2) demonstrating knowledge and skills, 3) guiding exercises, 4) checking understanding and feedback, 5) continuing the teaching [20].

The treatment given to the experimental group and control group was carried out for eight weeks (2 September - 28 October 2022) with face-to-face meetings between lecturers and students once a week according to the lecture schedule. That means both experimental and control groups received 100 minutes of face-to-face instruction, 120 minutes of independent assignments, and 120 minutes of structured assignments. For 100 minutes face-to-face instruction, the teacher gave treatment according to the type of treatment in each group, while 120 minutes was for independent assignments and 120 minutes for structured assignments. Table 3 is a breakdown of the treatments carried out in this study.

Table 3. Teaching treatment in experimental and control groups

No	Experimental group	Control Group
1	Innovation model syntax	DI model syntax Students know teaching objectives Students demonstrate swimming movements Students are taught guided by teachers Teacher checks student competence and feedback Further teaching Teaching evaluation
2	Students take a diagnostic test	
3	Students understand teaching problems	
4	Students understand objectives and target of the teaching project	
5	Designing various difficulties of learning materials	
6	Students arrange teaching project schedule	
7	Students practice movements and teacher monitors project development	
8	Teaching process feedback	
9	Learning experience evaluation	

Table 3 shows that the control group did not undergo the diagnostic test learning stage, so students did not receive information regarding their initial swimming skills. In addition, in the control group, there was no teaching with learning materials of various difficulty levels. In the control group, there was also no schedule for compiling or completing the learning project. In the control group, students only took part in guided exercises from the teacher like the learning that has been done so far.

For the final test stage (posttest), all students underwent the same test as they did at the initial stage, namely the participants took a 50-meter freestyle swimming skill test. To maintain the objectivity of the test results, we used two testers. The test result of the two testers were added up and divided by two and it became the final result of the freestyle swimming skill test.

2.5. Instruments

Freestyle swimming skills are measured through a 50-meter freestyle swimming test with the following assessment criteria: (1) body position, (2) leg movements, (3) arm movements, (4) breathing movements, and (5) coordination movements [4]. The assessment instrument in this study did not differentiate the initial level of students' ability based on the results of a diagnostic test/preliminary test, but it used a single instrument with the aim of stimulating students to be courageous and challenged to achieve high targets. In addition, we also used observation sheets to record the course of research in the field.

2.6. Statistical Analysis

The research data analysis in this study used the descriptive analysis (mean, standard deviation, minimum value, and maximum value). In addition, to find out whether or not there is an effect of the model being tested, we used the analysis of the average difference test (t-test) [21]. Before the t-test analysis was carried out, we conducted an analysis of the assumption test, namely the homogeneity test and the normality test [22]. All of these analyses were assisted by the IBM SPSS program version 26.00 [26,27].

3. Results

3.1. Descriptive Analysis

The results of this research, which are descriptively related to the integration of the PjBL teaching model with the inclusive teaching style and the traditional teaching model (DI) are presented in Table 4.

The results showed that in the experimental group, the average pretest and SD values were 9.02 ± 3.90, while the posttest scores were 16.27 ± 5.06. For the control group, the average pretest and SD values were 6.47 ± 2.66, while the posttest scores were 10.72 ± 3.66.

3.2. Test assumptions

The next analysis was to test the data assumptions before entering the t-test analysis. The testing of the assumptions of normality used the Kolmogorov-Smirnov (KS) normality test and the result is presented in Table 5. Based on the statistical analysis, the value of Sig. of the experimental and control groups were 0.491 and 0.053 respectively ($p > 0.05$). This indicates that the distribution of the two data is normal. For the results of the homogeneity test, the Leven's value was 4.666 with a Sig. 0.034 ($p < 0.05$). This indicates that the data distribution is not homogeneous or in other words the homogeneity assumption is not met.

2.4. T-Test

Considering that the assumption of requirements (homogeneity) was not met, we carried out a further analysis using a non-parametric test with the Wilcoxon analysis technique. The test result is presented in Tables 6 and 7. Based on this analysis technique, the experimental group obtained a Z value of 4,560 with a Sig. 0.000 ($p < 0.05$). This indicates that there is a significant effect of the use of the PjBL integration method and inclusive teaching style on students' freestyle swimming skills. For the control group, a Z value of -5,298 was obtained with a Sig. 0.000 ($p < 0.05$). This indicates that there is a significant effect of the use of traditional methods (DI) on students' freestyle swimming skills. The result of the t-test between the two groups is presented in Table 7. The results of the analysis show that a Z value of 5.275 is obtained with a Sig. 0.000 ($p < 0.05$). This indicates that there is a significant difference between the experimental group and the control group.

Table 4. Descriptive result of model tryout

Group	Stage	N	Mean	Std. Deviation	Minimum	Maximum
Experimental	Pretest	37	9.02	3.90	5.00	17.00
	Posttest	37	16.27	5.06	10.00	24.00
Control	Pretest	36	6.47	2.41	5.00	16.00
	Posttest	36	10.72	3.66	6.00	24.00

Table 5. Result of normality and homogeneity testing

Test Criteria	Parameter test	Experimental Group	Control Group
Normality	Kolmogorov-Smirnov Z	0.833	1.348
	Sig.	0.491	0.053
Homogeneity	Levene's Test Value	4.666	
	Sig.	0.034	

Table 6. Result of pretest-posttest of t-test

		N	Mean Rank	Sum of Ranks	Z	Sig.
Experimental G posttest – Experimental G pretest	Negative Ranks	3[a]	16.50	49.50	4.560	0.000
	Positive Ranks	34[b]	19.22	653.50		
	Ties	0[c]				
	Total	37				
Control G posttest – Control G pretest	Negative Ranks	0[d]	.00	.00	5.298	0.000
	Positive Ranks	36[e]	18.50	666.00		

	Ties	0[f]				
	Total	36				

Table 7. Result of inter-group t-test

Group	N	Mean Rank	Sum of Ranks	Z	Sig.
Experimental	37	49.86	1845.00	5.275	0.000
Control	36	23.78	856.00		

4. Discussion

This study aims to examine the effect of the integration of the PjBL and inclusive teaching models on freestyle swimming skills. The result shows that there is an increase in students' freestyle swimming skills, both in the group that was taught by using the teaching model that integrates PjBL and inclusive teaching style (experimental group), and in the group that was taught by using the traditional teaching or DI (control group). The increase in freestyle swimming skills was evident from the increase in the mean pre-test and post-test scores of each group. The average scores in the posttest of the two groups are higher than those in the pretest. This means, the model that integrating PjBL and inclusive teaching style and the traditional method (DI) have an effect on students' freestyle swimming skills.

The result of this study is in line with studies that tested the PjBL and inclusion models, which found relatively positive effects on learning outcomes. For example, research conducted by Sakbana et al. [25] and Susanti et al. [26] shows that the PjBL teaching model is very effective in improving student learning outcomes. In line with that, Latifah, Fauzia, & Kelana [27] reported that the learning outcome of students who were taught using the PjBL method showed higher results compared to the learning outcome of the control group. This happens because in the PjBL teaching model students are more able to think actively and creatively. They are faced with a pleasant atmosphere to solve a problem in everyday life [28].

Studies on the application of the inclusive teaching style also showed the same result, namely the method relatively has a positive effect on student learning outcomes. A study conducted by Hanif, Achmad & Mardesia [29] showed that the experimental group taught by using the inclusion style had higher results compared to the group taught by using the command style. Other research shows that the inclusive teaching style is better than the practice style and the inclusive teaching style along with the reciprocal teaching style is just as good at improving swimming skills in male students of Faculty of Sports and Health Education, IKIP PGRI Pontianak [30]. This increase is due to fact that the inclusive teaching style provides students with assignments that vary in the ability levels. Not only is it able to improve the swimming skills of the students that are physically and mentally normal, the inclusive teaching style is also able to accommodate swimming learning problems for children with special needs [31]. Inclusive teaching has the aim of accommodating all human needs for swimming and making swimming more friendly, especially for those who have special needs and limitations in swimming, such as physical disabilities and cognitive disabilities. Besides, inclusive teaching can be a tool to make autistic children able to interact and have the ability to live and interact with other people in different environments, especially through swimming activities [32].

Scientific evidence in the field shows that both PjBL and inclusive teaching models have a positive effect on student learning outcomes. Thus, our study strengthens previous evidence that tested the two models separately. The result of our research which integrated the two teaching models is in line with several previous studies that attempted to combine the two methods. Afriana et al. [33] who combined PjBL and STEM found that students became more creative, felt happy in groups, and had a higher interest to learn. In line with that, a study conducted by Ulya, Rifai, & Sulistyorini [34] which combined the PjBL teaching model with the talking stick type cooperative learning model showed that there was an increase in cognitive, affective, and psychomotor learning outcomes in students. It is most likely to have a positive impact on gross motor abilities [35]. This means the result of our study is supported by other studies that seek to integrate the PjBL teaching model with other methods.

The question then is what happens to the control group who received traditional learning with the DI model? In our study, it was shown that in the control group there was an increase in swimming skills. This is in line with studies conducted by other scientists who found that the DI model can improve students' skills. In addition, the application of the DI model accompanied by the use of various teaching media such as interactive multimedia, audio video, swimming board, and dryland is also effective in improving students' swimming skills [36],[40–43]. The strength of teaching by using the DI model lies in the role of the teacher who always dominates the teaching process and flow, so that students always follow the teacher's instructions. The occurrence of interactions is also determined by the teacher, if the teacher gives a question then the students answer, and then the teacher orders a discussion then the students will discuss, and vice versa. In other

words, the teaching-learning process depends on the teacher [39],[40].

Even though both groups experienced an increase in their skills, when a comparative analysis was carried out between groups, it appeared that there was a significant difference, namely the experimental group (PjBL and inclusive teaching models) had a greater score improvement than the control group. The posttest scores show that the experimental group scores are much higher than the control group scores (16.27 > 10.72). We believe that there is a higher increase in the experimental group compared to that in the control group because of the advantages of the PjBL teaching model and inclusive teaching style. The PjBL teaching model has advantages such as the presence of syntax which requires students to understand the learning problems they are experiencing. After understanding the problems, students will try to understand what kind of learning is suitable for them in achieving the desired goals. In the PjBL teaching model, this is called the project outcome design. Furthermore, students are assisted by teachers in compiling schedules to realize learning project achievements. Being monitored and investigated by their teacher, students carry out the project step by step to complete. The same thing can be seen from the inclusive teaching style. Teachers administered a diagnostic test on students to reveal students' initial abilities, so that students understand each other's initial abilities. Furthermore, students are presented with a menu of options or various levels of difficulty of movement tasks. Teachers give freedom to students to choose the learning material they want to study. Furthermore, teachers also give freedom to students who have been able to complete motion assignments at a low level to try movement tasks at a higher difficulty level. At the final stage, teachers evaluate and reflect on learning. With facts like that, the results that the experimental group's score is much higher than the control group's score make sense. The combination or integration of the two models seems to be more effective in improving freestyle swimming skills and more precise in solving problems that we encounter in the field.

Our observations during the research process show that students who were initially unable to swim at all chose the level 1 swimming difficulty, namely swimming at the edge of the pool at a depth of 75 centimeters with a distance of 25 meters using the lightest and easiest float. This level 1 choice was made until students were able to float, were able to protect themselves from water, and recognized the characteristics of water (waves, temperature, and depth) so that feelings of calm and confidence grow. At this level 1 option, repetition of up to 5-10 exercises is required. When learning face-to-face with teachers, it is advisable to try a higher level of difficulty. At the second level of difficulty, namely practicing the movement task in a pool with a depth of 75 centimeters with a distance of 25 meters but without using a float. In the beginning, it seemed that it was still difficult and there was fear, but after 5-8 repetitions the students seemed able to adapt and were able to get through the second level of difficulty well. At level 3 and so on, they also went through the same stage, namely the repetition stage several times before moving to a higher level. What students do in our study is in line with Thorndike's learning principle, namely the law of exercise [41]. In the proposition it is stated that the more often it is tried and practiced, the faster movement skills will be mastered [42].

Furthermore, PjBL and inclusive teaching styles with traditional methods (DI) had an influence on swimming skills in this study. There are, nevertheless, a few that can be crucial discussions in the research. Where the results of the maximum value of the PjBL and Inclusion learning style posttest with the traditional method (DI) presented the same results. The results are based on the final test scores achieved after receiving the PjBL and Inclusion learning treatment through traditional methods (DI). As a result, it will elicit a variety of responses, namely that the experimental and control learning approaches have the same effect on improving freestyle swimming skills. As a result, existing research must be considered [43],[44] the difference can be noticed in the average value to determine which is superior. The results of this investigation revealed a significant difference in the average posttest score. The results showed that the posttest of the experimental group was 16.27, while in the control group it was 10.72, so there was a difference of 5.55. Based on these findings, it is possible to conclude that the PjBL teaching style has a greater impact than the incorporation of traditional methods (DI).

Study Limitations and Further Study Directions

Even though we have tried to investigate in depth regarding the effect of the integration of the PjBL and inclusive teaching models on freestyle swimming skills, this study has limitations. First, since the research participants were already programmed in the class, individual randomization could not be carried out and this study carried out only random groups or classes. In experimental research, random individuals are a force to minimize bias or threats to internal validity [18][45]. Second, the study did not analyze in detail the relationship between male and female participants. In fact, physiologically [46] and motorically [47] there are differences in abilities between males and females. Third, this study does not consider the psychological aspects [49,50] of the participants involved in the research. In fact, aspects of anxiety [51,52], mental aspects [53,54], and aspects of religiosity and happiness [54] are very likely to play a role in determining learning outcomes. Based on these limitations, we recommend that future research be able to randomize individuals, taking into account gender and the psychological aspects of research participants.

5. Conclusion

The study's findings have a solid foundation in terms of PjBL learning for swimming classes, as evidenced by the discussion's findings. The findings revealed a considerable improvement in the PjBL teaching technique for freestyle swimming skills. Furthermore, the control group, which used inclusive teaching approaches with traditional methods (DI), improved significantly. Based on the results of the study, it can be concluded that both teaching by using the PjBL and inclusive teaching models and that by using the traditional methods (DI) have a positive effect on students' freestyle swimming skills and can improve students' freestyle swimming skills. However, the experimental group that was taught by using the integration of PjBL and inclusive teaching models appeared to have higher learning outcomes. The integration of the PjBL and inclusive teaching models makes students actively involved in learning, experience the learning process for themselves, and conclude as well as evaluate the learning process, whether or not it is successful. Teachers only facilitate, motivate, and direct so that the targets or goals set by students, namely those that are in accordance with their abilities, can be achieved. It is advised that future study randomize individuals while taking gender and psychological factors into account.

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REFERENCES

[1] P. Mardesia, F. Dlis, A. Sukur, R. Rusdi, and A. Abdillah, "Effectiveness of Teaching Style: An Alternative Breaststroke Swimming Learning Model in Higher Education," *Int. J. Hum. Mov. Sport. Sci.*, vol. 9, no. 6, pp. 1236–1243, 2021, doi: 10.13189/saj.2021.090618.

[2] W. M, Edi, Y. Hendrayana, A. Ma'mun, and B. Mulyana, "Aerobic interval training in freestyle swimming," *Int. J. Hum. Mov. Sport. Sci.*, vol. 8, no. 4, pp. 142–146, 2020, doi: 10.13189/saj.2020.080406.

[3] S. Saifu *et al.*, "The effect of small game exercise on freestyle swimming speed: A case study of Halu Oleo university sport science student," *Int. J. Hum. Mov. Sport. Sci.*, vol. 9, no. 6, pp. 1140–1145, 2021, doi: 10.13189/saj.2021.090609.

[4] M. Mashud and W. Widiastuti, "Pengembangan Pembelajaran Renang Gaya Bebas Berbasis Multimedia Interaktif," *Gladi J. Ilmu Keolahragaan*, vol. 9, no. 2, pp. 119–133, 2018, doi: 10.21009/gjik.092.05.

[5] D. Sanjaya, Pande, Made and N. N. Rediani, "Pembelajaran Berbantuan Video Model Latihan Renang Gaya Bebas Terhadap Penguasaan Gaya Bebas dan Kecepatan Renang Siswa Sekolah Dasar," *J. Penelit. dan Pengemb. Pendidik.*, vol. 6, no. 2, pp. 295–303, 2022, doi: cess: https://dx.doi.org/10.23887/jppp.v6i2.

[6] A. Ginting, M. Asmawi, J. Tangkudung, R. Raswin, and S. Lengkana, Anggi, "The Effectiveness of Learning Freestyle Swimming Using The ISLAMT2E Based on Static Swimming Tools," *Int. J. Hum. Mov. Sport. Sci.*, vol. 9, no. 5, pp. 863–875, 2021, doi: 10.13189/saj.2021.090506.

[7] J. Coyne, T. Hollas, and J. P. Potter, "Jumping In: Redefining Teaching and Learning in Physical Education Through Project-Based Learning: Column Editor: Anthony Parish," *Strategies*, vol. 29, no. 1, pp. 43–46, 2016, doi: 10.1080/08924562.2016.1113910.

[8] D. V. Sigit, R. H. Ristanto, and S. N. Mufida, "Integration of Project-Based E-Learning with STEAM: An Innovative Solution to Learn Ecological Concept," *Int. J. Instr.*, vol. 15, no. 3, pp. 23–40, 2022, doi: 10.29333/iji.2022.1532a.

[9] M. M. Sari, Rika, N. Priatna, and D. Juandi, "Implementing Project-Based Blended Learning Model Using Cognitive Conflict Strategy to Enhance Students' Mathematical Spatial Literacy," *Eur. J. Educ. Res.*, vol. 11, no. 4, pp. 2031–2041, 2022, doi: https://doi.org/10.12973/eu-jer.11.4.2031.

[10] W. Widiana, I, P. Parmiti, Desak, W. Kertih, I, A. Adiyana, Made, and G. Kristiantari, Maria, "The Effect of Project Based Assessment with Value Clarification Technique in Improving Students' Civics Learning Outcomes by Controlling the Family Environment," *Eur. J. Educ. Res.*, vol. 11, no. 4, pp. 1969–1979, 2022, doi: 10.12973/eu-jer.11.4.1969.

[11] M. Mosston and S. Ashworth, *Teaching Physical Education*. 2008.

[12] C. C. Chatoupis, "Physical Education Teachers' Use of Mosston and Ashworth's Teaching Styles: A Literature Review," *Phys. Educ.*, vol. 75, no. 5, pp. 880–900, 2018, doi: 1https://doi.org/10.18666/TPE-2018-V75-I5-8292.

[13] Ponidin, A. Haqiyah, and D. N. Riyadi, "Pengaruh Gaya Mengajar Dan Motivasi Belajar Terhadap Keterampilan Servis Atas Bola Voli," *Perspekt. Ilmu Pendidik.*, vol. 31, no. 1, p. 13, 2017, doi: 10.21009/pip.311.3.

[14] B. Wood, A. Triansyah, and F. P. Hidasari, "Pengaruh Metode Pembelajaran Inklusi Terhadap Hasil Belajar Forward Roll Pada Peserta didik SMPN 3," *J. Pendidik. dan Pembelajaran Khatulistiwa*, vol. 7, no. 4, pp. 1–9, 2018.

[15] Wulanningsih and I. S. Ellyas, "Penerapan gaya mengajar inklusi untuk meningkatkan hasil belajar lay up shoot bola basket pada siswa kelas v A SD Al Firdaus Surakarta tahun pelajaran 2015/2016," *Smart Sport J. Kepelatihan Olahraga*, vol. 8, no. 2, pp. 167–187, 2016.

[16] F. Ferawati and M. Mashud, "Gaya Mengajar Inklusi Untuk Meningkatkan Hasil Belajar Gerak Spesifik Servis Bawah Bolo Voly Siswa Kelas VII," *J. Patriot*, vol. 4, no. 4, pp. 273–286, 2022, doi: 10.24036/patriot.v%vi%i.870.

[17] J. Fraenkel, N. Wallen, and H. Hyun, *How to design and evaluate research in education*, 8th ed. New York: McGraw-Hill Companies, Inc, 2012.

[18] J. R. Thomas, J. K. Nelson, and S. J. Silverman, *Research Methods in Physical Activity*, 7th ed. Champaign, IL: Human Kinetics Publisher, Inc., 2015.

[19] M. F. P. Putra and T. S. Guntoro, *Metodologi penelitian dalam pendidikan dan olahraga*. Lamongan: CV Pustaka Ilalang, 2016.

[20] M. Sukardjo and M. Salam, "Effect of concept attainment models and self-directed learning (SDL) on mathematics learning outcomes," *Int. J. Instr.*, vol. 13, no. 3, pp. 275–292, 2020, doi: 10.29333/iji.2020.13319a.

[21] L. H. Vaughn, Debbie and R. G. Lomax, *Statistical Concepts-A First Course*. New York: Taylor & Francis, 2020.

[22] M. F. P. Putra, *Analisis statistika: Aplikasi dalam penelitian olahraga*. Malang: CV Wineka Media, 2021.

[23] N. Leech, K. Barrett, and G. A. Morgan, *SPSS for Intermediate Statistics: Use and interpretation*, 5th ed. New York: Routledge Taylor & Fracis Group, 2015.

[24] M. F. P. Putra, *Aplikasi analisis inferensial dengan Program SPSS*. Jayapura: PT Media Publikasi Kita, 2023.

[25] R. S. Sakbana, W. Sunarno, and S. Budiawanti, "The Influence of Project-Based Learning Model on Creativity and Cognitive Learning Outcomes of the Students of SMAN 1 Amarasi Timur, Indonesia," *Int. J. Sci. Soc.*, vol. 3, no. 1, 2021, doi: 10.54783/ijsoc.v3i1.283.

[26] S. Susanti, J. Susilowibowo, and T. Hardini, Han, "Effectiveness of Project-based Learning Models to Improve Learning Outcomes and Learning Activities of Students in Innovative Learning," in *KnE Social Sciences*, 2019, vol. 29, no. 11, p. 82. doi: 10.18502/kss.v3i11.4000.

[27] N. Latifah, U. Fauzia, and J. B. Kelana, "Natural Science Problem Solving in Elementary School Students Using the Project Based Learning (PjBL) Model," *J. Ilm. Sekol. Dasar*, vol. 4, no. 4, pp. 596–603, 2020.

[28] M. T. C. Gerhana, M. Mardiyana, and I. Pramudya, "The Effectiveness of Project Based Learning in Trigonometry," *J. Phys. Conf. Ser.*, vol. 895, no. 1, 2017, doi: 10.1088/1742-6596/895/1/012027.

[29] S. Hanif, Achmad and P. Mardesia, "Teaching styles and motivation in learning breast stroke in swimming," *Asian Soc. Sci.*, vol. 10, no. 5, pp. 2–6, 2014, doi: 10.5539/ass.v10n5p2.

[30] R. Rusdi, F. Dlis, J. Lubis, A. D. Nata, and W. Whalsen, "The Effect of Teaching Style Pratice, Reciprocity, Inclusion and Learning Motivation on Butterfly Swimming Skills," *Kinestetik J. Ilm. Pendidik. Jasm.*, vol. 4, no. 2, pp. 63–69, 2020, doi: 10.33369/jk.v4i2.12574.

[31] E. A. Roche, *UND Scholarly Commons Inclusivity In Usa Swimming : A Sport For Every Ability*. North Dakota: University of North Dakota, 2022.

[32] S. Napolitano, "Swimming as an Inclusion Tool for Autistic Subjects," *JPES J. Phys. Educ. Sport.*, vol. 17, no. 5, pp. 2339–2343, 2017, doi: 10.7752/jpes.2017.s5256.

[33] J. Afriana, A. Permanasari, and A. Fitriani, "Penerapan project based learning terintegrasi STEM untuk meningkatkan literasi sains siswa ditinjau dari gender," *J. Inov. Pendidik. IPA*, vol. 2, no. 2, p. 202, 2016, doi: 10.21831/jipi.v2i2.8561.

[34] F. Ulya, A. Rifai RC, and S. Sulistyorini, "The Effectiveness of Project-Based Learning Model and Talking stickType of Cooperative Learning Model on the Quran-Hadith Subject Learning Outcomes," *Innov. J. Curric. Educ. Technol.*, vol. 9, no. 2, pp. 87–93, 2020, doi: 10.15294/ijcet.v9i2.40173.

[35] Y. T. J. Samodra *et al*., "Analysis of gross motoric analysis of elementary school students: A comparative study of students in hill and coastal areas," *Pedagog. Phys. Cult. Sport.*, vol. 27, no. 2, pp. 139–145, 2023, doi: 0.15561/26649837.2023.0206.

[36] S.-A. Lao, B. E. Furlonger, D. W. Moore, and M. Busacca, "Learning to swim using video modelling and video feedback within a self-management program," *Aust. J. Adult Learn.*, vol. 56, no. 1, pp. 52–68, 2016.

[37] R. Pambudi, Akbar, "Effectiveness of Dryland Training Models on Free Style Swimming for Strength of Muscle Muscle Using Modification of Rowing Tools " for," *IJER Indones. J. Educ. Rev.*, vol. 6, no. 1, pp. 73–84, 2019.

[38] H. Sin, Tjung and F. Hudayani, "The influence of swimming learning method using swimming board towards students' interest in freestyle," *J. Keolahragaan*, vol. 8, no. 2, pp. 216–221, 2020, doi: 10.21831/jk.v8i2.34412.

[39] D. Suryadi *et al*., "Problem-based learning model: Can it improve learning outcomes for long serve in badminton," *Edu Sport. Indones. J. Phys. Educ.*, vol. 4, no. 1, pp. 29–36, 2023, doi: 10.25299/es:ijope.2023.vol4(1).10987.

[40] R. P. Perdana, E. Supriatna, N. Yanti, and D. Suryadi, "Team Game Tournament (TGT)-type cooperative learning model: How does it affect the learning outcomes of football shooting?," *Edu Sport. Indones. J. Phys. Educ.*, vol. 4, no. 1, pp. 86–96, 2023, doi: 10.25299/es:ijope.2023.vol4(1).12130.

[41] J. . Bransford, *How people learn : brain, mind, experience, and school*. Washington, D.C: National Academi Press, 2000.

[42] S. Duchesne and A. McMaugh, *Educational Psychology for Learning and Teaching*, 5th ed. Melbourne: Cangage Learning, 2016.

[43] D. Suryadi, "Analisis kebugaran jasmani siswa: Studi komparatif antara ekstrakurikuler bolabasket dan futsal," *Edu Sport. Indones. J. Phys. Educ.*, vol. 3, no. 2, pp. 100–110, 2022, doi: 10.25299/es:ijope.2022.vol3(2).9280.

[44] Y. Haïdara, A. Okilanda, R. Dewintha, and D. Suryadi, "Analysis of students' basic basketball skills: A comparative study of male and female students," *Tanjungpura J. Coach. Res.*, vol. 1, no. 1, pp. 1–5, 2023, doi: 10.26418/tajor.v1i1.63796.

[45] D. Moher *et al*., "CONSORT 2010 explanation and elaboration: updated guidelines for reporting parallel group randomised trials," *BMJ*, vol. 340, p. c869, 2010, doi: 10.1136/bmj.c869.

[46] W. L. Kenney, J. H. Wilmore, and D. L. Costill, *Physiology of sport and exercise*. Champaign, IL: Human Kinetics, 2012.

[47] B. Abernethy, S. Hanraham, V. Kippers, L. . Mackinnon, and M. . Pandy, *The biophysical Foundations of human movement*. Champaign, IL: Human Kinetics, 2005.

[48] R. S. Weinberg and D. Gould, *Foundations of Sport and Exercise Psychology*, 6th ed. Champaign, IL 61825: Human Kinetics Publisher, Inc., 2015.

[49] K. Kogoya, T. S. Guntoro, and M. F. P. Putra, "Sports Event Image, Satisfaction, Motivation, Stadium Atmosphere, Environment, and Perception: A Study on the Biggest Multi-Sport Event in Indonesia during the Pandemic," *Soc. Sci.*, vol. 11, no. 6, pp. 1–13, 2022, doi: 10.3390/socsci11060241.

[50] M. F. P. Putra *et al*., "Psychometric properties at Indonesian version of the Sport Anxiety Scale-2: Testing on elite athletes of Papua, Indonesian," *Int. J. Hum. Mov. Sport. Sci.*, vol. 9, no. 6, pp. 1477–1485, 2021, doi: 10.13189/saj.2021.090645.

[51] M. F. P. Putra and T. S. Guntoro, "Competitive State Anxiety Inventory – 2R (CSAI-2R): Adapting and Validating Its Indonesian Version," *Int. J. Hum. Mov. Sport. Sci.*, vol. 10, no. 3, pp. 396–403, 2022, doi: 10.13189/saj.2022.100305.

[52] Sutoro, T. S. Guntoro, and M. F. P. Putra, "Development and validation mental training model: Mental Toughness Training Circle (MTTC)," *F1000Reserach*, vol. 12, no. 169, pp. 1–36, 2023, doi: 10.12688/f1000research.129010.1.

[53] M. F. P. Putra, Sutoro, and E. Sinaga, "Mental atlet: Konstruk, pengukuran, dan arah penelitian ke depan," *Multilater. J. Pendidik. Jasm. dan Olahraga*, vol. 22, no. 1, pp. 63–79, 2023, doi: 10.20527/multilateral.v22i1.14785 Alamat.

[54] T. S. Guntoro and M. F. P. Putra, “Athletes’ religiosity: How it plays a role in athletes’ anxiety and life satisfaction,” *HTS Teol. Stud. Stud.*, vol. 78, no. 1, p. a7802, 2022, doi: 10.4102/hts.v78i1.7802.

Integrating project-based learning and inclusive teaching style: an innovation to improve freestyle swimming skill

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Integrating the Project-Based Learning and the Inclusive Teaching Style: An Innovation to Improve Freestyle Swimming Skills

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Abstract This study aims to examine the effect of the integration of the project-based learning (P-BL) model and the inclusive teaching style on freestyle swimming skills. This research is an experiment with a nonequivalent control group design. A total of 73 students were involved in the study and were divided into two groups, namely the experimental group and the control group. The experimental group was given a learning treatment using the integration of the P-BL teaching model and an inclusive teaching style, while the control group used traditional learning or Direct Instruction (DI). The intervention was carried out for eight weeks with face-to-face meetings between lecturers and students once a week according to the lecture schedule. Both experimental and control groups received 100 minutes of face-to-face teaching, 120 minutes of independent assignments, and 120 minutes of structured assignments. There are two instruments used to measure freestyle swimming skills, namely the 50-meter freestyle swimming test and the observation sheet of the experimental process. Descriptive analysis, data requirement test, and t-test were used to analyze research data. The findings of the study show that teaching by using the P-BL and inclusive teaching models and teaching that uses traditional methods (DI) have a positive effect and can improve students' freestyle swimming skills ($p < 0.05$). Even so, there is a significant difference between the experimental and control groups as evidenced by the Z-value of -5.275 and the Sig. 0.000 ($p < 0.05$). The experimental group that was taught by using the integration of the P-BL and inclusive teaching models appeared to have higher learning outcomes.

Keywords Freestyle Swimming Skills, Inclusive Teaching Style, Project-Based Learning Model

1. Introduction

Based on my ten-year experience of teaching freestyle

swimming, teaching freestyle swimming can be described as follows: (1) Students' independence in learning or practicing is still low. Studying is done for only 100 minutes (two hours of lectures), that is, when the lecture is in progress. (2) Students do not yet understand how to learn or practice effectively, namely in accordance with the characteristics of their abilities. Learning or exercises carried out by students tend to imitate what is seen and done by teachers or other students. Students do not understand what material is suitable and safe for their safety. (3) The time the students spend on participation in learning or practicing every week is limited. (4) The learning process in courses does not involve the full role of students in solving their own learning problems, so the learning process during one semester is less meaningful and does not bring results according to the expectations of learning objectives.

With the problem of teaching freestyle swimming above, we have reviewed various alternative solutions from learning the findings of the research related to the effectiveness of teaching freestyle swimming. We explored international scientific reference search engines such as ScienceDirect, DOAJ, EBSCO, and a national scientific publication search engine called “Garba Reference Digital (Garuda)” using the keywords “effectiveness of freestyle swimming teaching,” “freestyle swimming training,” and "teaching freestyle swimming" from 2015 to 2022 received two major research themes, namely (1) research related to improving freestyle swimming skills using teaching or training models or methods (see for example [1], [2], and(2) research on improving swimming skills by applying various teaching media (see for example [3],[4]. Even so, when we analyzed more deeply, we did not find any alternative solutions to the related problems we encountered in the field.

The research above tends to produce findings that have a single impact, namely on the hard skill aspect, while the soft skill aspect has not been touched. In fact, soft skills such as independence, discipline, responsibility, and toughness to continue learning are important foundations for students in the future. Based on this, the question of how to teach freestyle swimming skills that are able to make students independent and understand what is learned according to their abilities arises.

We are of the view that a teaching innovation is needed to answer the questions above in addition to solving the problems we encounter in the field. Integrating the project-based learning (P-BL) model with an inclusive teaching style, which we value, can be an alternative solution and innovation in the teaching of freestyle swimming. The P-BL teaching model is a teaching pattern that educates students to obtain learning objectives by being directly involved in the stages of learning by doing assignments in a scheduled and controlled manner in the form of completing teaching products [5]. This means P-BL is not learning what is told and is fixated on procedures and instructions from teachers; so the active role of teaching shifts from teachers to students. Teachers only act as facilitators and motivators in the teaching-learning process. The advantage of the P-BL teaching model in teaching is that it provides students with opportunities to solve their own learning problems by communicating and collaborating with friends in their groups. In the long run, the P-BL teaching model will make students trained and educated independently to be able to learn to realize their learning goals. Studies that test P-BL tend to find positive results in relation to student learning outcomes [6].

In contrast to P-BL, the inclusive teaching style is the teaching that refers to the theory of Mosston & Ashworth [7]. In theory, they explain that inclusive teaching is teaching that presents a variety of materials in the form of various difficulties for students. Inclusive teaching aims to facilitate a wide variety of student competency characteristics, so that in learning, students can determine the level of difficulty in their learning [8]. Studies that examine inclusive teaching styles tend to find positive results when associated with aspects of student learning and psychological outcomes (see for example [9].

With this understanding, we are of the view that integrating the P-BL teaching model with an inclusive teaching style can be a solutive innovation in improving students' freestyle swimming skills. The use of these two models in one unit will complement each other and perfect the stages of the teaching process. The P-BL teaching model highlights learning achievement products accompanied by a schedule for the achievement of learning outcomes, while the inclusive teaching style highlights the diversity of learning material difficulties accompanied by the freedom of students to choose their load and learning method. Thus, the integration of the two models is expected to improve not only hard skills (increased learning outcomes) but also soft skills (creative attitude, independent learning, motivation, and self-confidence). Schematically, the integration of the P-BL teaching model and the inclusive teaching style is presented in Table 1 below.

Until now, the integration of the two models (P-BL and inclusive teaching models) has never been carried out by scientists. Therefore, this study will be a pioneer in integrating the two teaching models used in overcoming problems in the teaching of swimming. For this reason, the aim of this study is to examine the effect of the integration of the P-BL and inclusive teaching models on freestyle swimming skills.

Table 1. Integrating P-BL teaching model with inclusive teaching style

Project-Based Learning Model [5]	Inclusive Teaching Style [8], [10]	Innovation Model
Determining basic questions	Diagnostic Assessment	Diagnostic Assessment
Designing product planning	Determining teaching objectives	Determining objectives and designing product planning
Arranging product-making schedule	Designing various teaching material difficulties	Designing various teaching material difficulties
Monitoring project activeness and development	Demonstrating and teaching practice	Arranging product-making schedule
Testing the result	Teaching process feedback	Practicing and monitoring project development
Learning experience evaluation	Teaching result feedback	Teaching process feedback
		Learning experience evaluation

2. Materials and Methods

2.1. Ethical Clearance

The protocol of the study was approved by the Health Research Ethics Committee with the number 145/KEPK/2022. Information about the study was explained to the students; objectives, data collection steps, timing of the research study, and benefits of participation in the research project were given to the students. All respondents were requested to provide written informed consent before participating in this study.

2.2. Research Design

This type of research used to examine the effect of the integration of the P-BL and inclusive teaching models on freestyle swimming skills is a quasi-experiment with a nonequivalent control group design. With this design, this study has two groups, namely the experimental group and the control group [11]. In the experimental design, this design is seen as a better design because there is a comparison group and there is a pretest and posttest [12].

2.3. Participants

The research participants are students of the Physical Education Study Program, Faculty of Teacher Training and Education, Lambung Mangkurat University, Banjarmasin, South Kalimantan, Indonesia. The criteria for participants in this study are (1) students who program aquatic basics courses in even semesters, and (2) students who are physically and mentally healthy. Based on these criteria, three classes with a total of 120 students become the subjects of this research. To determine the experimental group and the control group, we did not randomize individuals but we randomized groups. The group random technique is used if the characteristics of each existing class (three classes) are not much different. Based on this, one class with 37 students was established as the experimental group and one class with 36 students as the control group, thus totaling 73 students. Of the 73 students, 57 are males and 16 are females. Their age ranges from 19 to 20 years.

2.4. Experimental Procedures

Our research procedure is divided into three stages, namely (1) the pre-test or diagnostic test stage, (2) the treatment stage, and (3) the post-test stage. At the pre-test or diagnostic test stage, all students who are the study sample underwent a pre-test in 50-meter freestyle swimming skills. The result of this pre-test was used as comparative data after the research series was completed.

At the second stage, namely giving treatment, we tested the P-BL teaching model with an inclusive teaching style. The experimental group was given a learning treatment using the integration of P-BL and inclusion teaching models. The following are the stages of the procedure used in this study: (1) diagnostic assessment, (2) determining goals and designing product plans, (3) designing a variety of learning material difficulties, (4) arranging product-making schedules, (5) practicing and monitoring project development, (6) feedback on the teaching process, and (7) evaluation of learning experiences. In terms of difficulty levels, we divide learning materials into six levels as presented in Table 2.

The control group was taught by using the traditional learning method that has been used in teaching swimming so far, namely Direct Instruction (DI). The teaching by using the DI model was carried out by following the teaching syntax including 1) conveying goals and motivating students, 2) demonstrating knowledge and skills, 3) guiding exercises, 4) checking understanding and feedback, and 5) continuing the teaching [13].

Table 2. Difficulty Level of Swimming Practice

No	Swimming Difficulty Level	Materials
1	Level 1 Difficulty	Swimming at a depth of 75 centimeters with a distance of 25 meters, using a float
2	Level 2 Difficulty	Swimming at a depth of 75 centimeters with a distance of 25 meters, without a float
3	Level 3 Difficulty	Swimming at a depth of 100 centimeters with a distance of 25 meters, using a float
4	Level 4 Difficulty	Swimming at a depth of 100 centimeters with a distance of 25 meters, without a float
5	Level 5 Difficulty	Swimming at a depth of 150 centimeters with a distance of 25 meters
6	Level 6 Difficulty	Swimming at a depth of 200 centimeters with a distance of 50 meters

Table 3. Teaching treatment in experimental and control groups

No	Experimental group	Control Group
1	Innovation model syntax.	DI model syntax. Students know teaching objectives. Students demonstrate swimming movements. Students are taught, guided by teachers. The teacher checks student competence and feedback. Further teaching. Teaching evaluation.
2	Students take a diagnostic test.	
3	Students understand teaching problems.	
4	Students understand the objectives and target of the teaching project.	
5	Designing various difficulties of learning materials.	
6	Students arrange teaching project schedule.	
7	Students practice movements and the teacher monitors project development.	
8	Teaching process feedback.	
9	Learning experience evaluation.	

The treatment given to the experimental group and control group was carried out for eight weeks (2 September - 28 October 2022) with face-to-face meetings between lecturers and students once a week according to the lecture schedule. That means both experimental and control groups received 100 minutes of face-to-face instruction, 120 minutes of independent assignments, and 120 minutes of structured assignments. For 100 minutes of face-to-face instruction, the teacher gave treatment according to the type of treatment in each group, while 120 minutes was for independent assignments and 120 minutes for structured assignments. Table 3 is a breakdown of the treatments carried out in this study.

Table 3 shows that the control group did not undergo the diagnostic test learning stage, so students did not receive information regarding their initial swimming skills. In addition, in the control group, there was no teaching with learning materials of various difficulty levels. In the control group, there was also no schedule for compiling or completing the learning project. In the control group, students only took part in guided exercises from the teacher like the learning that has been done so far.

For the final test stage (posttest), all students underwent the same test as they did at the initial stage, namely the participants took a 50-meter freestyle swimming skill test. To maintain the objectivity of the test results, we used two testers. The test result of the two testers were added up and divided by two and it became the final result of the freestyle swimming skill test.

2.5. Instruments

Freestyle swimming skills are measured through a 50-meter freestyle swimming test with the following assessment criteria: (1) body position, (2) leg movements, (3) arm movements, (4) breathing movements, and (5) coordination movements [14]. The assessment instrument in this study did not differentiate the initial level of students' ability based on the results of a diagnostic test/preliminary test, but it used a single instrument with the aim of stimulating students to be courageous and challenged to achieve high targets. In addition, we also used observation sheets to record the course of research in the field.

2.6. Statistical Analysis

The research data analysis in this study used the descriptive analysis (mean, standard deviation, minimum value, and maximum value). In addition, to find out whether or not there is an effect of the model being tested, we used the analysis of the average difference test (t-test) [15]. Before the t-test analysis was carried out, we conducted an analysis of the assumption test, namely the homogeneity test and the normality test. All of these analyses were assisted by the IBM SPSS program version

26.00 [16], [17].

3. Results

3.1. Descriptive Analysis

The results of this research, which are descriptively related to the integration of the P-BL teaching model with the inclusive teaching style and the traditional teaching model (DI) are presented in Table 4.

The results showed that in the experimental group, the average pretest and SD values were 9.02 ± 3.90, while the posttest scores were 16.27 ± 5.06. For the control group, the average pretest and SD values were 6.47 ± 2.66, while the posttest scores were 10.72 ± 3.66.

3.2. Test Assumptions

The next analysis was to test the data assumptions before entering the t-test analysis. The testing of the assumptions of normality used the Kolmogorov-Smirnov (KS) normality test and the result is presented in Table 5. Based on the statistical analysis, the value of Sig. of the experimental and control groups were 0.491 and 0.053 respectively ($p > 0.05$). This indicates that the distribution of the two data is normal. For the results of the homogeneity test, the Leven's value was 4.666 with a Sig. 0.034 ($p < 0.05$). This indicates that the data distribution is not homogeneous or, in other words, the homogeneity assumption is not met.

3.3. T-Test

Considering that the assumption of requirements (homogeneity) was not met, we carried out a further analysis using a non-parametric test with the Wilcoxon analysis technique. The test result is presented in Tables 6 and 7. Based on this analysis technique, the experimental group obtained a Z value of 4,560 with a Sig. 0.000 ($p < 0.05$). This indicates that there is a significant effect of the use of the P-BL integration method and inclusive teaching style on students' freestyle swimming skills. For the control group, a Z value of -5,298 was obtained with a Sig. 0.000 ($p < 0.05$). This indicates that there is a significant effect of the use of traditional methods (DI) on students' freestyle swimming skills. The result of the t-test between the two groups is presented in Table 7. The results of the analysis show that a Z value of 5.275 is obtained with a Sig. 0.000 ($p < 0.05$). This indicates that there is a significant difference between the experimental group and the control group.

Table 4. Descriptive result of model tryout

Group	Stage	N	Mean	Std. Deviation	Minimum	Maximum
Experimental	Pretest	37	9.02	3.90	5.00	17.00
	Posttest	37	16.27	5.06	10.00	24.00
Control	Pretest	36	6.47	2.41	5.00	16.00
	Posttest	36	10.72	3.66	6.00	24.00

Table 5. Result of normality and homogeneity testing

Test Criteria	Parameter test	Experimental Group	Control Group
Normality	Kolmogorov-Smirnov Z	0.833	1.348
	Sig.	0.491	0.053
Homogeneity	Levene's Test Value	4.666	
	Sig.	0.034	

Table 6. Result of pretest-posttest of t-test

		N	Mean Rank	Sum of Ranks	Z	Sig.
Experimental G posttest – Experimental G pretest	Negative Ranks	3[a]	16.50	49.50	4.560	0.000
	Positive Ranks	34[b]	19.22	653.50		
	Ties	0[c]				
	Total	37				
Control G posttest – Control G pretest	Negative Ranks	0[d]	.00	.00	5.298	0.000
	Positive Ranks	36[e]	18.50	666.00		
	Ties	0[f]				
	Total	36				

Table 7. Result of inter-group t-test

Group	N	Mean Rank	Sum of Ranks	Z	Sig.
Experimental	37	49.86	1845.00	5.275	0.000
Control	36	23.78	856.00		

4. Discussion

This study aims to examine the effect of the integration of the P-BL and inclusive teaching models on freestyle swimming skills. The result shows that there is an increase in students' freestyle swimming skills, both in the group that was taught by using the teaching model that integrates P-BL and inclusive teaching style (experimental group), and in the group that was taught by using the traditional teaching or DI (control group). The increase in freestyle swimming skills was evident from the increase in the mean pre-test and post-test scores of each group. The average scores in the posttest of the two groups are higher than those in the pretest. This suggests that the model combining P-BL, inclusive instruction, and the conventional approach (DI) has an influence on students' freestyle swimming ability.

The result of this study is in line with studies that tested the P-BL and inclusion models, which found relatively positive effects on learning outcomes. For example, research conducted by Sakbana et al. [18] and Susanti et al. [19] shows that the P-BL teaching model is very effective in improving student learning outcomes. In line with that, Latifah, Fauzia, & Kelana [20] reported that the learning outcome of students who were taught using the P-BL method showed higher results compared to the learning outcome of the control group. This happens because in the P-BL teaching model students are more able to think actively and creatively. They are faced with a pleasant atmosphere to solve a problem in everyday life [21].

Studies on the application of the inclusive teaching style also showed the same result, namely the method relatively has a positive effect on student learning outcomes. A study conducted by Hanif, Achmad & Mardesia [22] showed that the experimental group taught by using the inclusion style had higher results compared to the group taught by using the command style. Other research shows that the inclusive teaching style is better than the practice style and the inclusive teaching style along with the reciprocal teaching style is just as good at improving swimming skills in male students of Faculty of Sports and Health Education, IKIP PGRI Pontianak [23]. This increase is due to fact that the inclusive teaching style provides students with assignments that vary in the ability levels. Not only is it able to improve the swimming skills of the students that are physically and mentally normal, the inclusive teaching style is also able to accommodate swimming learning problems for children with special needs [24]. Inclusive teaching has the aim of accommodating all human needs for swimming and making swimming more friendly, especially for those who have special needs and limitations in swimming, such as physical disabilities and cognitive disabilities. Besides, inclusive teaching can be a tool to make autistic children able to interact and have the ability to live and interact with other people in different environments, especially through swimming activities [25].

Scientific evidence in the field shows that both P-BL and inclusive teaching models have a positive effect on student learning outcomes. Thus, our study strengthens previous evidence that tested the two models separately. The result of our research which integrated the two teaching models is in line with several previous studies that attempted to combine the two methods. Afriana et al. [26] who combined P-BL and STEM found that students became more creative, felt happy in groups, and had a higher interest to learn. In line with that, a study conducted by Ulya, Rifai, & Sulistyorini [27] which combined the P-BL teaching model with the talking stick type cooperative learning model showed that there was an increase in cognitive, affective, and psychomotor learning outcomes in students. It is most likely to have a positive impact on gross motor abilities [17]. This means the result of our study is supported by other studies that seek to integrate the P-BL teaching model with other methods.

The question then is what happens to the control group who received traditional learning with the DI model? In our study, it was shown that in the control group there was an increase in swimming skills. This is in line with studies conducted by other scientists who found that the DI model can improve students' skills. In addition, the application of the DI model accompanied by the use of various teaching media such as interactive multimedia, audio video, swimming board, and dryland is also effective in improving students' swimming skills [28], [29]. The strength of teaching by using the DI model lies in the role of the teacher who always dominates the teaching process and flow; so that students always follow the teacher's instructions. The occurrence of interactions is also determined by the teacher, if the teacher gives a question then the students answer, and then the teacher orders a discussion then the students will discuss, and vice versa. In other words, the teaching-learning process depends on the teacher [30], [31].

Even though both groups experienced an increase in their skills, when a comparative analysis was carried out between groups, it appeared that there was a significant difference, namely that the experimental group (P-BL and inclusive teaching models) had a greater score improvement than the control group. The posttest scores show that the experimental group scores are much higher

than the control group scores (16.27 > 10.72). We believe that there is a higher increase in the experimental group compared to that in the control group because of the advantages of the P-BL teaching model and inclusive teaching style. The P-BL teaching model has advantages such as the presence of syntax which requires students to understand the learning problems they are experiencing. After understanding the problems, students will try to understand what kind of learning is suitable for them in achieving the desired goals. In the P-BL teaching model, this is called the project outcome design. Furthermore, students are assisted by teachers in compiling schedules to realize learning project achievements. Being monitored and investigated by their teacher, students carry out the project step by step to complete it. The same thing can be seen in the inclusive teaching style. Teachers administered a diagnostic test on students to reveal students' initial abilities, so that students understand each other's initial abilities. Furthermore, students are presented with a menu of options or various levels of difficulty of movement tasks. Teachers give freedom to students to choose the learning material they want to study. Furthermore, teachers also give freedom to students who have been able to complete motion assignments at a low level to try movement tasks at a higher difficulty level. At the final stage, teachers evaluate and reflect on learning. With facts like that, the results that the experimental group's score is much higher than the control group's score make sense. The combination or integration of the two models seems to be more effective in improving freestyle swimming skills and more precise in solving problems that we encounter in the field.

Our observations during the research process show that students who were initially unable to swim at all chose the level 1 swimming difficulty, namely swimming at the edge of the pool at a depth of 75 centimeters with a distance of 25 meters using the lightest and easiest float. This level 1 choice was made until students were able to float, were able to protect themselves from water, and recognized the characteristics of water (waves, temperature, and depth) so that feelings of calm and confidence grow. At this level 1 option, repetition of up to 5-10 exercises is required. When learning face-to-face with teachers, it is advisable to try a higher level of difficulty. At the second level of difficulty, namely practicing the movement task in a pool with a depth of 75 centimeters with a distance of 25 meters but without using a float. In the beginning, it seemed that it was still difficult and there was fear, but after 5-8 repetitions the students seemed able to adapt and were able to get through the second level of difficulty well. At level 3 and so on, they also went through the same stage, namely the repetition stage several times before moving to a higher level. What students do in our study is in line with Thorndike's learning principle, namely the law of exercise [32]. In the proposition it is stated that the more often it is tried and practiced, the faster the movement skills will be mastered [33].

Furthermore, P-BL and inclusive teaching styles with traditional methods (DI) had an effect on swimming skills in this study. There are, however, a few instances in the research when the maximum value of the P-BL and the Inclusion learning style posttest using the conventional approach (DI) had the same findings. The results are based on the final test scores achieved after receiving the P-BL and Inclusion learning treatment through traditional methods (DI). As a result, it will elicit a variety of responses, namely that the experimental and control learning approaches have the same effect on improving freestyle swimming skills. As a result, existing research must be considered [34],[35],[36] the difference can be noticed in the average value to determine which is superior. The results of this investigation revealed a significant difference in the average posttest score. The results showed that the posttest of the experimental group was 16.27, while in the control group it was 10.72, so there was a difference of 5.55. Based on these findings, it is possible to conclude that the P-BL teaching style has a greater impact than the incorporation of traditional methods (DI).

4.1. Study Limitations and Further Study Directions

Even though we have tried to investigate in depth regarding the effect of the integration of the P-BL and inclusive teaching models on freestyle swimming skills, this study has limitations. First, since the research participants were already programmed in the class, individual randomization could not be carried out and this study carried out only random groups or classes. In experimental research, random individuals are a force to minimize bias or threats to internal validity [12], [37]. Second, the study did not analyze in detail the relationship between male and female participants. In fact, physiologically [38] and motorically [39] there are differences in abilities between males and females. Third, this study does not consider the psychological aspects [40] of the participants involved in the research. In fact, aspects of anxiety [41], mental aspects and aspects of religiosity and happiness are very likely to play a role in determining learning outcomes. Based on these limitations, we recommend that future research be able to randomize individuals, taking into account gender and the psychological aspects of research participants.

5. Conclusions

The study's findings have a solid foundation in terms of P-BL learning for swimming classes, as evidenced by the discussion's findings. The findings revealed a considerable improvement in the P-BL teaching technique for freestyle swimming skills. Furthermore, the control group, which used inclusive teaching approaches with traditional methods (DI), improved significantly. Based on the results of the study, it can be concluded that both teaching by using the P-BL and inclusive teaching models and that by using

the traditional methods (DI) have a positive effect on students' freestyle swimming skills and can improve students' freestyle swimming skills. However, the experimental group that was taught by using the integration of P-BL and inclusive teaching models appeared to have higher learning outcomes. The integration of the P-BL and inclusive teaching models makes students actively involved in learning, experience the learning process for themselves, and conclude as well as evaluate the learning process, whether or not it is successful. Teachers only facilitate, motivate, and direct so that the targets or goals set by students, namely those that are in accordance with their abilities, can be achieved. It is advised that future studies randomize individuals while taking gender and psychological factors into account.

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REFERENCES

[1] P. Mardesia, F. Dlis, A. Sukur, R. Rusdi, and A. Abdillah, "Effectiveness of Teaching Style: An Alternative Breaststroke Swimming Learning Model in Higher Education," *Int. J. Hum. Mov. Sport. Sci.*, vol. 9, no. 6, pp. 1236–1243, 2021, doi: 10.13189/saj.2021.090618.

[2] W. M, Edi, Y. Hendrayana, A. Ma'mun, and B. Mulyana, "Aerobic interval training in freestyle swimming," *Int. J. Hum. Mov. Sport. Sci.*, vol. 8, no. 4, pp. 142–146, 2020, doi: 10.13189/saj.2020.080406.

[3] S. Saifu *et al.*, "The effect of small game exercise on freestyle swimming speed: A case study of Halu Oleo university sport science student," *Int. J. Hum. Mov. Sport. Sci.*, vol. 9, no. 6, pp. 1140–1145, 2021, doi: 10.13189/saj.2021.090609.

[4] A. Ginting, M. Asmawi, J. Tangkudung, R. Raswin, and S. Lengkana, Anggi, "The Effectiveness of Learning Freestyle Swimming Using The ISLAMT2E Based on Static Swimming Tools," *Int. J. Hum. Mov. Sport. Sci.*, vol. 9, no. 5, pp. 863–875, 2021, doi: 10.13189/saj.2021.090506.

[5] J. Coyne, T. Hollas, and J. P. Potter, "Jumping In: Redefining Teaching and Learning in Physical Education Through Project-Based Learning: Column Editor: Anthony Parish," *Strategies*, vol. 29, no. 1, pp. 43–46, 2016, doi: 10.1080/08924562.2016.1113910.

[6] D. V. Sigit, R. H. Ristanto, and S. N. Mufida, "Integration of Project-Based E-Learning with STEAM: An Innovative Solution to Learn Ecological Concept," *Int. J. Instr.*, vol. 15, no. 3, pp. 23–40, 2022, doi: 10.29333/iji.2022.1532a.

[7] M. Mosston and S. Ashworth, *Teaching Physical Education*. 2008.

[8] C. C. Chatoupis, "Physical Education Teachers' Use of Mosston and Ashworth's Teaching Styles: A Literature Review," *Phys. Educ.*, vol. 75, no. 5, pp. 880–900, 2018, doi: 1https://doi.org/10.18666/TPE-2018-V75-I5-8292.

[9] B. Wood, A. Triansyah, and F. P. Hidasari, "The Effect of Inclusive Learning Methods on Forward Roll Learning Outcomes in Students of SMPN 3," *J. Pendidik. dan Pembelajaran Khatulistiwa*, vol. 7, no. 4, pp. 1–9, 2018.

[10] F. Ferawati and M. Mashud, "Inclusive Teaching Style to Improve Learning Outcomes of Specific Motion of Bolo Volleyball Lower Serve for Students in Grade VII," *J. Patriot*, vol. 4, no. 4, pp. 273–286, 2022, doi: 10.24036/patriot.v%vi%i.870.

[11] J. Fraenkel, N. Wallen, and H. Hyun, *How to design and evaluate research in education*, 8th ed. New York: McGraw-Hill Companies, Inc, 2012.

[12] J. R. Thomas, J. K. Nelson, and S. J. Silverman, *Research Methods in Physical Activity*, 7th ed. Champaign, IL: Human Kinetics Publisher, Inc., 2015.

[13] M. Sukardjo and M. Salam, "Effect of concept attainment models and self-directed learning (SDL) on mathematics learning outcomes," *Int. J. Instr.*, vol. 13, no. 3, pp. 275–292, 2020, doi: 10.29333/iji.2020.13319a.

[14] M. Mashud and W. Widiastuti, "Interactive Multimedia-based Freestyle Swimming Learning Development," *Gladi J. Ilmu Keolahragaan*, vol. 9, no. 2, pp. 119–133, 2018, doi: 10.21009/gjik.092.05.

[15] L. H. Vaughn, Debbie and R. G. Lomax, *Statistical Concepts-A First Course*. New York: Taylor & Francis, 2020.

[16] N. Leech, K. Barrett, and G. A. Morgan, *SPSS for Intermediate Statistics: Use and interpretation*, 5th ed. New York: Routledge Taylor & Fracis Group, 2015.

[17] Y. T. J. Samodra *et al.*, "Analysis of gross motoric analysis of elementary school students: A comparative study of students in hill and coastal areas," *Pedagog. Phys. Cult. Sport.*, vol. 27, no. 2, pp. 139–145, 2023, doi: 0.15561/26649837.2023.0206.

[18] R. S. Sakbana, W. Sunarno, and S. Budiawanti, "The Influence of Project-Based Learning Model on Creativity and Cognitive Learning Outcomes of the Students of SMAN 1 Amarasi Timur, Indonesia," *Int. J. Sci. Soc.*, vol. 3, no. 1, 2021, doi: 10.54783/ijsoc.v3i1.283.

[19] S. Susanti, J. Susilowibowo, and T. Hardini, Han, "Effectiveness of Project-based Learning Models to Improve Learning Outcomes and Learning Activities of Students in Innovative Learning," in *KnE Social Sciences*, 2019, vol. 29, no. 11, p. 82. doi: 10.18502/kss.v3i11.4000.

[20] N. Latifah, U. Fauzia, and J. B. Kelana, "Natural Science Problem Solving in Elementary School Students Using the Project Based Learning (PjBL) Model," *J. Ilm. Sekol. Dasar*, vol. 4, no. 4, pp. 596–603, 2020.

[21] M. T. C. Gerhana, M. Mardiyana, and I. Pramudya, "The Effectiveness of Project Based Learning in Trigonometry," *J. Phys. Conf. Ser.*, vol. 895, no. 1, 2017, doi: 10.1088/1742-6596/895/1/012027.

[22] S. Hanif, Achmad and P. Mardesia, "Teaching styles and motivation in learning breast stroke in swimming," *Asian*

Soc. Sci., vol. 10, no. 5, pp. 2–6, 2014, doi: 10.5539/ass.v10n5p2.

[23] R. Rusdi, F. Dlis, J. Lubis, A. D. Nata, and W. Whalsen, "The Effect of Teaching Style Pratice, Reciprocity, Inclusion and Learning Motivation on Butterfly Swimming Skills," *Kinestetik J. Ilm. Pendidik. Jasm.*, vol. 4, no. 2, pp. 63–69, 2020, doi: 10.33369/jk.v4i2.12574.

[24] E. A. Roche, *UND Scholarly Commons Inclusivity In Usa Swimming : A Sport For Every Ability*. North Dakota: University of North Dakota, 2022.

[25] S. Napolitano, "Swimming as an Inclusion Tool for Autistic Subjects," *JPES J. Phys. Educ. Sport.*, vol. 17, no. 5, pp. 2339–2343, 2017, doi: 10.7752/jpes.2017.s5256.

[26] J. Afriana, A. Permanasari, and A. Fitriani, "Application of STEM-integrated project-based learning to improve students' science literacy in terms of gender," *J. Inov. Pendidik. IPA*, vol. 2, no. 2, p. 202, 2016, doi: 10.21831/jipi.v2i2.8561.

[27] F. Ulya, A. Rifai RC, and S. Sulistyorini, "The Effectiveness of Project-Based Learning Model and Talking stickType of Cooperative Learning Model on the Quran-Hadith Subject Learning Outcomes," *Innov. J. Curric. Educ. Technol.*, vol. 9, no. 2, pp. 87–93, 2020, doi: 10.15294/ijcet.v9i2.40173.

[28] S. A. Lao, B. E. Furlonger, D. W. Moore, and M. Busacca, "Learning to swim using video modelling and video feedback within a self-management program," *Aust. J. Adult Learn.*, vol. 56, no. 1, pp. 52–68, 2016.

[29] H. Sin, Tjung and F. Hudayani, "The influence of swimming learning method using swimming board towards students' interest in freestyle," *J. Keolahragaan*, vol. 8, no. 2, pp. 216–221, 2020, doi: 10.21831/jk.v8i2.34412.

[30] D. Suryadi *et al.*, "Problem-based learning model: Can it improve learning outcomes for long serve in badminton," *Edu Sport. Indones. J. Phys. Educ.*, vol. 4, no. 1, pp. 29–36, 2023, doi: 10.25299/es:ijope.2023.vol4(1).10987.

[31] R. P. Perdana, E. Supriatna, N. Yanti, and D. Suryadi, "Team Game Tournament (TGT)-type cooperative learning model: How does it affect the learning outcomes of football shooting?," *Edu Sport. Indones. J. Phys. Educ.*, vol. 4, no. 1, pp. 86–96, 2023, doi: 10.25299/es:ijope.2023.vol4(1).12130.

[32] J. Bransford, *How people learn : brain, mind, experience, and school*. Washington, D.C: National Academi Press, 2000.

[33] S. Duchesne and A. McMaugh, *Educational Psychology for Learning and Teaching*, 5th ed. Melbourne: Cangage Learning, 2016.

[34] Y. Ha ̈dara, A. Okilanda, R. Dewintha, and D. Suryadi, "Analysis of students' basic basketball skills: A comparative study of male and female students," *Tanjungpura J. Coach. Res.*, vol. 1, no. 1, pp. 1–5, 2023, doi: 10.26418/tajor.v1i1.63796.

[35] Rubiyatno *et al.*, "Analysis of differences in physical fitness levels of extracurricular futsal students: Survey studies on urban and rural environments," *Pedagog. Phys. Cult. Sport.*, vol. 27, no. 3, pp. 208–214, 2023, doi: 10.15561/26649837.2023.0304.

[36] D. Suryadi *et al.*, "Comparative Analysis of Soccer and Futsal Extracurriculars: A Survey Study of Physical Fitness Profiles," *Phys. Educ. Sport. Stud. Res.*, vol. 2, no. 1, pp. 59–71, 2023, doi: 10.56003/pessr.v2i1.182.

[37] D. Moher *et al.*, "CONSORT 2010 explanation and elaboration: updated guidelines for reporting parallel group randomised trials," *BMJ*, vol. 340, p. c869, 2010, doi: 10.1136/bmj.c869.

[38] W. L. Kenney, J. H. Wilmore, and D. L. Costill, *Physiology of sport and exercise*. Champaign, IL: Human Kinetics, 2012.

[39] B. Abernethy, S. Hanraham, V. Kippers, L. . Mackinnon, and M. . Pandy, *The biophysical Foundations of human movement*. Champaign, IL: Human Kinetics, 2005.

[40] R. S. Weinberg and D. Gould, *Foundations of Sport and Exercise Psychology*, 6th ed. Champaign, IL 61825: Human Kinetics Publisher, Inc., 2015.

[41] M. F. P. Putra and T. S. Guntoro, "Competitive State Anxiety Inventory – 2R (CSAI-2R): Adapting and Validating Its Indonesian Version," *Int. J. Hum. Mov. Sport. Sci.*, vol. 10, no. 3, pp. 396–403, 2022, doi: 10.13189/saj.2022.100305.